

2017-2018 CATALOG

ST. CLOUD
TECHNICAL & COMMUNITY
COLLEGE





GENERAL CATALOG

2017 - 2018

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St. Cloud, MN 56303-1240

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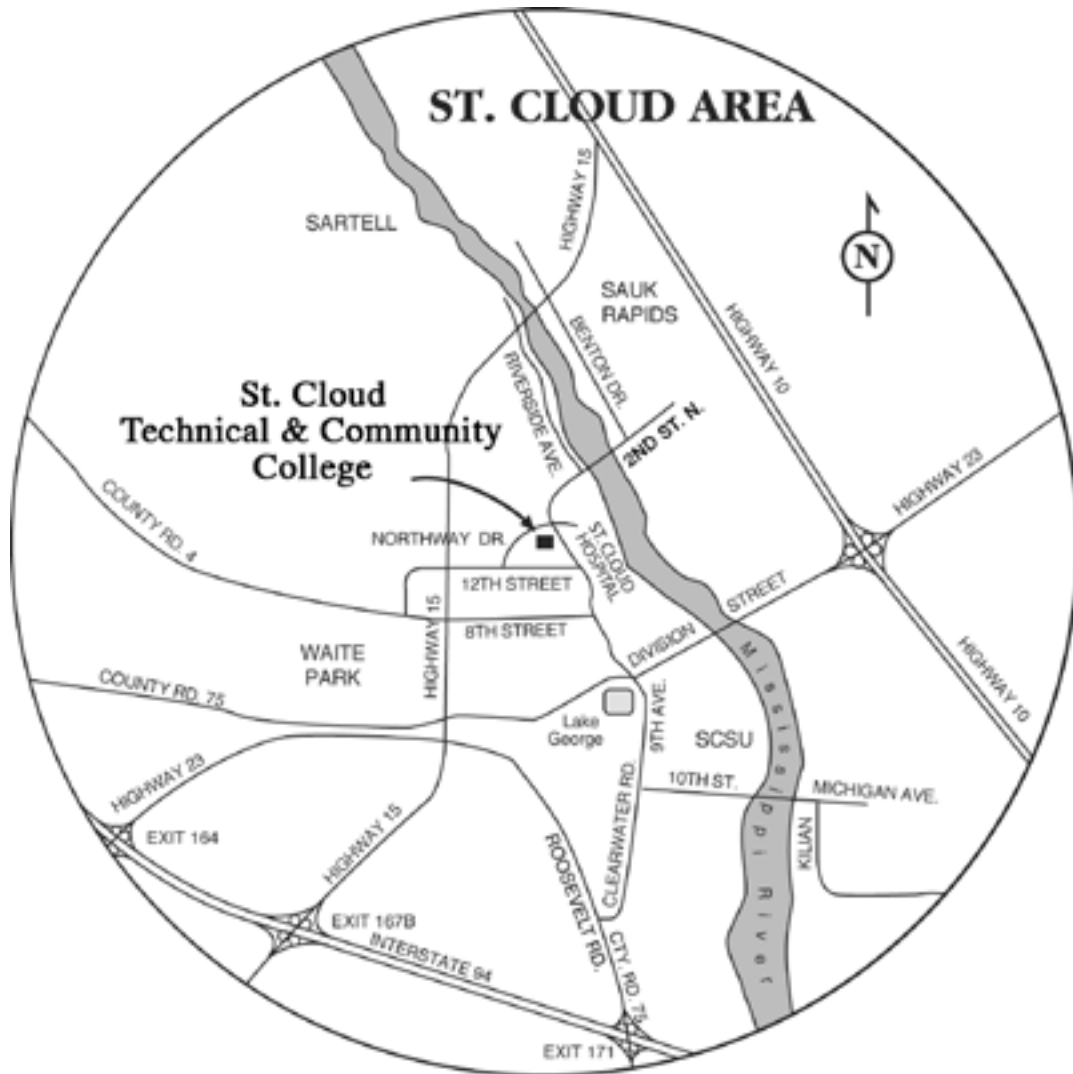
Toll Free: 800-222-1009

www.sctcc.edu

Every effort has been made to ensure the accuracy of the material contained within this catalog as of the date of publication. However, all policies, procedures, academic schedules, program information, and fees are subject to change at any time by appropriate action of the faculty, the College administration, the Minnesota State Colleges and Universities Board of Trustees or the Minnesota Legislature without prior notification. The provisions of this catalog do not constitute a contract between the student and the College. The information in this catalog is for use as an academic planning tool and is subject to change at any time.

Upon printing of this catalog, all previous issues are revoked. Published June 2017.

This publication is available in accessible formats upon request by calling Kerby Plante at (320) 308-5920. TTY users please call MN Relay Service at 711 to contact the college.



Location of St. Cloud Technical and Community College: 1540 Northway Drive, St. Cloud, MN 56303
 (320) 308-5000 or 1-800-222-1009 or www.sctcc.edu.

The Admissions is located in the northwest section of the Northway Building. Parking is available in Lot C adjacent to Northway Drive.

Driving Directions:

- **From the southeast on I-94**, take the St. Augusta exit #171, travel Country Road 75 north approximately 1 mile to Clearwater Road. Turn right and follow Clearwater Road until it becomes Ninth Avenue, which will take you through the city to our campus.
- **From the west on I-94**, take the Highway 15 exit, then follow Highway 15 north to 12th Street. Turn right and follow 12th Street east until you reach Northway Drive. Follow Northway Drive to our campus.
- **From the north on Highway 10**, take the Highway 15 exit. Take the Benton Drive exit, turn left on Benton Drive through Sauk Rapids. Turn right at 2nd Street North, go across the Mississippi River bridge, continue straight ahead on Ninth Avenue to our campus.
- **From south on Highway 10 or the east on Highway 23**, at the cloverleaf follow Highway 23 West/Division Street to the Ninth Avenue North exit. Turn right and follow Ninth Avenue North to our campus.
- **From the south on Highway 15 or southwest Highway 23**, follow Highway 15 north to 12th Street. Turn right and follow 12th Street east until you reach Northway Drive. Follow Northway Drive to our campus.

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GENERAL INFORMATION

College Overview

As a highly recognized institution of technical programs and applied learning, St. Cloud Technical and Community College (SCTCC) is one of the fastest growing two-year colleges within the Minnesota State Colleges and Universities system. Located in an urban area with a population of approximately 68,000, just one hour north of the Minneapolis/St. Paul metro area, SCTCC is the second largest higher education institution in the St. Cloud area.

St. Cloud Technical and Community College was founded in 1948 as a vocational-technical institute and was part of the local school district. In 1966, the College moved from the high school to its present location on Northway Drive. The North Central Association of Colleges and Schools accredited the college in 1985. In 1995, the college became a member of the newly-formed Minnesota State Colleges and Universities system. In 2010 SCTCC became a comprehensive technical and community college.

SCTCC offers 46 majors with over 90 certificate, diploma or degree options that can be completed in two years or less. The College serves over 6,000 students per year with 80% of the student population drawn from the five-county central Minnesota area. Committed to *delivering an education that works*, the college's primary goal is to prepare students for transfer or a rewarding career. Over the last decade approximately 95% of SCTCC graduates have found employment in their area of study.

Mission

St. Cloud Technical and Community College prepares students for lifelong learning by providing career, technical and transferable education.

Vision

St. Cloud Technical and Community College is the college of choice for quality career, technical and transferable education, focused on highly-skilled employment and lifelong learning opportunities.

Core Values

- Student success through collaboration and cooperation
- A friendly, respectful, enthusiastic, safe, and diverse atmosphere
- Student-centered from prospect through alumni
- Staff development and success
- A team oriented environment
- Relationships with industry and the community
- Quality and continuous improvement
- Innovation, creativity, and flexibility
- Contextual and technologically driven learning

College Outcomes

- *Demonstrate Personal and Social Accountability*

Students will develop a sense of personal and professional responsibility by incorporating values into ethical decision-making.

- *Think Critically*

Through consideration of multiple perspectives, students will clarify, analyze, and develop methods that are useful for solving problems and complex issues to make valid, relevant, and informed decisions.

- *Communicate Effectively*

Students will use appropriate processes to demonstrate effective communications in a variety of contexts and formats including listening, reading, speaking, and writing.

College Outcomes (continued)

- *Understand Social & Global Perspectives*

Students will demonstrate a global perspective and identify the key components of social responsibility in their profession, their community, and in the rapidly changing world.

- *Apply Knowledge*

Students will demonstrate knowledge and skills through interdisciplinary application of concepts and constructs. Application of knowledge takes place through student participation in experiences across all disciplines, which includes practice and demonstration to adapt intellectually and to develop workplace readiness.

Equal Opportunity:

St. Cloud Technical and Community College is committed to providing equal education and employment opportunities to all persons regardless of race, color, creed, sex, age, religion, marital status, sexual orientation/affectional preference, national origin, mental or physical disability, status with regard to public assistance or any other group or class against which discrimination is prohibited by State or Federal law. Further, the college will not tolerate acts of sexual harassment/assault within its area of jurisdiction.

St. Cloud Technical and Community College will continue to remain in full compliance with: Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990 and the 1992 Crime Bill. Inquiries, complaints or grievances concerning the application of affirmative action, equal opportunity or Title IX at SCTCC should be referred to the affirmative action officer, Deb Holstad, located in office 1-402, or by telephone at (320) 308-3227, or student affirmative action officer Missy Majerus at (320) 308-5922. Inquiries about services offered under Section 504 of the Rehabilitation Act of 1973 or the Americans with Disabilities Act of 1990 should be referred to the Director of Academic Foundations, Kerby Plante, who is located in office 1-112, or by telephone at (320) 308-5920, or (320) 308-5988 (TTY).

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ACCREDITATIONS

St. Cloud Technical and Community College is accredited by
The Higher Learning Commission
30 North LaSalle Street, Suite 2400
Chicago, IL 60602
www.hlcommission.org

In addition to institutional accreditation, all programs offered at St. Cloud Technical and Community College are approved by the Minnesota State Colleges and Universities System. The following programs are accredited, licensed or approved by national, state or program specific agencies.

Automotive Service, Auto Body Repair and Medium/Heavy Truck are accredited by the National Automotive Technician Education Foundation (NATEF), 101 Blue Seal Drive, Suite 101, Leesburg, VA 20175. Telephone: (703) 669-6650.

Cardiovascular Technology is accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP), 1361 Park Street, Clearwater, FL 33756. Telephone: (727) 210-2350 Fax: (727) 210-2350, web site: www.caahep.org and Joint Review Committee on Education in Cardiovascular Technology (JRC-CVT), 1449 Hill Street, Whitinsville, MA 01588-1032. Telephone: (978) 456-5594 www.jrccvt.org.

Dental Assisting is accredited by the Commission on Dental Accreditation. The Commission is a specialized accrediting body recognized by the United States Department of Education. The Commission on Dental Accreditation can be contacted at (312) 440-4563 or at 211 East Chicago Avenue, Chicago, IL 60611. The Commission's web site is www.ada.org/en/coda.

Dental Hygiene is accredited by the Commission on Dental Accreditation. The Commission is a specialized accrediting body recognized by the United States Department of Education. The Commission on Dental Accreditation can be contacted at (312) 440-4653 or at 211 East Chicago Avenue, Chicago, IL 60611. The Commission's web address is: www.ada.org/en/coda.

Diagnostic Medical Sonography Generalist is accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP), 1361 Park Street, Clearwater, FL 33756. Telephone: (727) 210-2350 Fax: (727) 210-2350. www.caahep.org and Joint Review Committee on Education in Diagnostic Medical Sonography, 6021 University Blvd, Suite 500, Ellicott City, MO 21043. Telephone: (443) 973-3257. Fax: (866) 738-3444. www.jrcdms.org

Electrical Construction Technology is certified by the Minnesota Department of Labor and Industry, 443 Lafayette Road N, St Paul, MN 55155, Telephone: (651) 284-5005.

Emergency Medical Services (EMS) courses are approved by the Minnesota Emergency Medical Services Regulatory Board (EMSRB) to teach Emergency Medical Responder (EMR) and Emergency Medical Technician (EMT) initial and refresher courses. The cardiopulmonary resuscitation (CPR) and first aid courses are conducted through the American Heart Association and National Safety Council standards. EMSRB, 2829 University Avenue SE, Suite 310, Minneapolis, MN 55414.

Energy Technical Specialist – Nuclear is certified by the Nuclear Energy Institute, 1201 F St. NW, Suite 1100, Washington, DC 20004-1218, Phone (202) 739-8000, Fax (202) 785-4019. www.nei.org/

Health Information Technology is accredited by the Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM), 223 North Michigan Avenue, 21st Floor, Chicago, IL 60601-5800. Telephone: (312) 223-1100. www.cahiim.org.

Associate Degree Nursing (ADN) is approved by the Minnesota State Board of Nursing. State of Minnesota Board of Nursing, 2829 University Avenue SE, 2nd floor, Minneapolis, MN 55414-3253. Telephone: (612) 617-2270 or (888) 234-2690.

Nursing Assistant is approved by the Minnesota Department of Health, 85 East Seventh Place, Suite 300, P.O. Box 64501, St. Paul, MN 55164-0501. Telephone: (651) 215-8705.

Paramedicine is approved by the Minnesota Emergency Medical Services Regulatory Board (EMSRB) and nationally accredited by the "Committee on Accreditation of Educational Programs for the EMS Professions" (CoAEMSP), Suite 111-312, 8301 Lakeview Parkway, Rowlett, TX 75088. Telephone: (214) 703-8445. Fax (214) 703-8992 and Commission on Accreditation of Allied Health Education Programs (CAAHEP), 1361 Park Street, Clearwater, FL 33756. Telephone: (727) 210-2350. Fax: (727) 210-2350. www.caahep.org

Practical Nursing is approved by the Minnesota State Board of Nursing. State of Minnesota Board of Nursing, 2829 University Avenue SE, #200, Minneapolis, MN 55414-3253. Telephone: (612) 317-3000 or (888) 234-2690. The program is accredited by the Accreditation Commission for Education in Nursing (ACEN). ACEN, 3343 Peachtree Road NE, Suite 850, Atlanta, GA 30326. Telephone: (404)-975-5000.

Surgical Technology is accredited by Commission on Accreditation of Allied Health Education Programs (CAAHEP), 1361 Park Street, Clearwater, FL 33756. Telephone: (727) 210-2350. Fax: (727) 210-2350. www.caahep.org and Accreditation Review Council on Education in Surgical Technology and Surgical Assisting (ARC-STSA), 6 West Dry Creek Circle, Suite 110, Littleton, CO 80120. Phone: (303) 694-9262. Fax: (303) 741-3655.

Water Environmental Technologies is certified by the Minnesota Department of Health and the Minnesota Pollution Control Agency, 520 Lafayette Road, St. Paul, MN 55155-4194. Telephone: (651) 296-6300.

ADMISSIONS

ADMISSIONS POLICY

St. Cloud Technical and Community College grants admission to all persons 16 years of age or older regardless of race, creed, color, veterans status, religion, gender, physical ability, age, national origin, marital status, sexual orientation, or public assistance status. Admission to courses is based on meeting validated course prerequisites.

Lack of English skills should not be a barrier to admission or participation. In order to eliminate barriers appropriate measures are taken to assess each student's ability to participate and benefit through placement testing and advising. Based on the assessment and advising, students are then provided with campus services or a referral to community services to be better prepared for successful participation.

Applications are taken beginning the third Tuesday in September, one year prior to the start of fall semester. The college has a rolling admission policy; meaning that applications are acted upon and students are notified of admission generally within 14 days of the receipt of all application materials.

Once admitted to SCTCC, students may enroll in any course or program as long as individual course pre-requisites are met and space for effective instruction is available. The college will guide a student's enrollment based on academic skills assessments, interviews, previous achievement and other criteria as explained in this section.

Admission to the college does not guarantee admission to college-level courses or a desired major. Students applying for programs with selective admissions criteria may be required to complete pre-requisite courses and/or take additional tests prior to admission. Students who do not meet the standards for admission into a certain program may enroll in college readiness courses designed to help them meet program qualifications.

Priority will be given to completed applications received at least four weeks prior to the first day of class. The college will process applications until operating at capacity.

If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study or on your chances to obtain federal, state, and other higher education financial aid.

ADMISSIONS PROCEDURES

Students pursuing a degree, diploma or certificate must complete the following admission requirements.:

1. Submit an SCTCC Application

Available from the SCTCC Admissions Office, online at www.sctcc.edu/application or in most high school guidance offices.

2. Pay a \$20 Non-refundable Application Fee

Online payment is accepted with a credit card when completing the online application. If mailing a paper version of the application, please include the \$20 fee with the application. Students who have previously paid the application fee at SCTCC are exempt from payment.

3. Transcripts

Transcripts are not required for admission to the college but may be submitted if you wish to provide a record of your ACT, SAT or MCA scores. Students with ACT, SAT or MCA scores may be exempt from portions of the course placement testing requirement.

High school transcripts may be required to verify high school graduation for financial aid purposes. Official college transcripts are required from students with previous college level course work when transferring credits. Official non Minnesota State transcripts must be sent directly from the previous college in a sealed envelope. Minnesota State transcripts can be obtained electronically by SCTCC, but the Admissions Office must be aware that the student has previously attended a Minnesota State college.

Students with transcripts issued from any country outside of the United States will be required to have their transcripts evaluated by organizations affiliated with National Association of Credential Evaluation Services (NACES). Information can be found at naces.org/members.htm/. The student will incur any costs associated with having the evaluation completed. For college transcript evaluations, it is recommended that students request a course by course evaluation. Students who cannot provide proof of high school graduation may be eligible for Admission, but may not receive financial aid.

Students Suspended from Other Institutions (See Minnesota State Policy 3.4)

Students on academic suspension from a Minnesota State College or University shall not be admitted to St. Cloud Technical and Community College during the term of that suspension unless they demonstrate potential for being successful in the particular program to which they apply. Any student who left his/her previous college on academic suspension must complete the admissions appeal process to be

considered for admission.

Any student who left his/her previous college on academic suspension and is subsequently accepted to SCTCC will be accepted on warning (whether or not their suspension period has ended or an appeal has been approved). If suspension date and reinstatement dates are posted, those are the dates that will be used. For Minnesota State colleges, it will be assumed that academic suspensions will be posted. If a suspension is posted, but reinstatement date is not noted, eligibility for reinstatement will be considered to be one year.

Students who have been suspended or expelled for disciplinary reasons from any postsecondary institution may be denied admission to a Minnesota State college or university.

Background Check for Health Programs

State law requires that any person who intends to provide services that involve direct contact with patients and residents at a health care facility have a background check provided by the state of Minnesota.

An individual who is disqualified as a result of a background check has the right to request reconsideration of the disqualification. It is the responsibility of the student to request reconsideration by the Commissioner of Health. An applicant is considered to be disqualified during the reconsideration process. *A student who has any restriction will not be sent to a clinical site.* Please see individual program handbooks for special procedures.

Impact of Criminal Records

Students who have been arrested, charged or convicted of any criminal offense, should investigate the impact that the arrest, charge or conviction may have on their chances of employment in the field they intend to study or on their chances to obtain federal, state, and other higher education financial aid.

Unpaid Balance at Previous Institution (See Minnesota State Policy 3.4)

Students who have an unpaid balance at another system college or university shall not be allowed to register for courses at SCTCC.

INTERNATIONAL STUDENT ADMISSION PROCEDURES

International student applicants must submit the following materials and information:

1. A completed international student application form available from the Admissions Office or online at www.sctcc.edu/international-students.
2. A \$20 non-refundable application fee.
3. Students with transcripts issued from any country

outside of the United States will be required to have their transcripts evaluated by organizations affiliated with National Association of Credential Evaluation Services (NACES). Information can be found at naces.org/members.htm/. The student will incur any costs associated with having the evaluation completed. For college transcript evaluations, it is recommended that students request a course by course evaluation. Students must provide proof of high school graduation.

4. A completed Confidential Financial Information Form and Affidavit of Financial Support including bank statements.
5. Proof of English Proficiency, if English is a second language (TOEFL, Michigan or college transcripts demonstrating a satisfactory level of English proficiency).
6. Health insurance must be purchased through the College upon enrollment.

VISITING AND NON-DEGREE SEEKING STUDENT ADMISSION

Persons who are interested in registering for selected courses, but are not interested in pursuing a diploma or degree at SCTCC, are designated by the College as visiting and non-degree seeking students. These students are not required to complete the usual application or to submit high school transcripts, but must meet course placement or pre-requisite requirements. Students should consider declaring a major once they have completed 16 credits. Contact Records and Registration for additional information at (320) 308-5075.

TRANSFER STUDENT ADMISSIONS

To apply as a transfer student, 12 quarter or 8 semester credits must have been completed with a passing grade at a regionally or nationally accredited college-level institution. Students who have earned less than 12 quarter or 8 semester credits should apply as a first year student.

Students who have earned college credits only through post secondary enrollment option (PSEO) should apply as a first year student. Applicants must submit:

1. A completed college application form. Questions concerning availability of program openings should be directed to the Admissions Office.
2. A \$20 non-refundable application fee attached to the application form.
3. An official academic transcript from each previously attended college or university must be on file. The College can access and obtain most Minnesota State transcripts electronically. The student must arrange to have any non-Minnesota State transcripts sent to the College.

Transcripts are official only when recorded on the transcript form and sent directly from the sending institution to SCTCC or accessed through e-transcript. Transcripts mailed or presented by the student cannot be used for transfer.

HIGH SCHOOL OPTIONS

Articulated College Credit

SCTCC works with area high school teachers to align select high school courses with college courses. This alignment is evidenced by a signed articulation agreement between the institutions. Students who achieve a grade of B or higher in the course and are approved by the high school teacher will be issued a Record of Articulated College Credit. Students must print their Record of Articulated College Credit and present it to the SCTCC Registration Office for review. Students and teachers can access articulated college credit information at ctecreditmn.com/.

Acceptance of Articulation Agreements

Non-Member Districts

St. Cloud Technical and Community College will consider accepting articulated college credit from other Minnesota articulated college credit consortia. The student must submit a Record of Articulated College Credit. The Registrar will review the record to determine if the content is applicable to an SCTCC course and will then forward to the appropriate faculty member for approval. Records and Registration will contact the student with the results of the review.

DISCOVERY ACADEMY

Discovery Academy is an opportunity for high school students to take college courses. The courses are taught in various cooperating high schools throughout the region. The courses are posted in the high school course catalog and interested students register through their high school guidance counselor. Occasionally a course is offered in a neighboring school district and students will need to travel to the site to participate. Most courses are taught by a high school teacher – a few courses are taught by college faculty. More information is available at www.sctcc.edu/discovery-academy.

Courses available in 2017-18 may include:

Health:

Emergency Medical Responder

Automotive:

Engine Performance

Steering and Suspension

Brakes

Electrical/Electronic Systems

Welding:

Thermal Welding & Cutting Processes

Print Reading & Math Applications

Arc Welding Processes

If you would like more information about these courses, where they are offered, and how to apply, please contact St. Cloud Technical and Community College at (320) 308-5359.

POST SECONDARY ENROLLMENT OPTION (PSEO)

Students wishing to attend SCTCC utilizing the PSEO program must submit a completed college application, Notice of Student Registration (NOSR) form, and a high school transcript by the application deadline (Fall Semester, June 1, and Spring Semester, November 1). Students must also schedule an appointment for ACCUPLACER testing and a meeting with the PSEO coordinator at SCTCC to discuss procedures and social aspects of using the program.

Who is Eligible for PSEO?

Students need to meet prerequisite requirements for the course. The college or university makes the final determination on a student's readiness.

- High school seniors must be in the upper one-half of their class or score at or above the 50th percentile on the ACT or SAT.
- Juniors must be in the upper one-third of their class or score at or above the 70th percentile on a test, such as the ACT or SAT.
- Sophomores may enroll in a career or technical education course at a Minnesota State college or university if they have attained a passing score or met the 8th grade standard on the 8th grade Minnesota Comprehensive Assessment in reading and meet other course prerequisites or course enrollment standards established by the college. These standards include but are not limited to assessment test scores, program admission or other requirements.
- If a sophomore receives a grade of C or better in the course, the student shall be allowed to take additional career or technical education courses in subsequent terms.
- A student who first enrolls under this provision while in 10th grade and wishes to enroll in general education courses as an 11th or 12th grade student must take the system Assessment for Course Placement and achieve the required scores prior to enrollment.
- Campuses may require eligible 10th grade PSEO students who wish to enroll in a career and technical course to meet with a college advisor.
- Colleges and universities may admit students based on other documentation of ability to perform college-level work.

There is a \$10 charge to retake the Accuplacer test. If testing accommodations are needed, documentation of disability is required in advance. Testing with accommodations is often scheduled individually.

If test scores are not achieved, college readiness courses may be required to prepare for the identified classes. The Post Secondary Enrollment Options program does not cover tuition or book costs for college readiness courses. Students are required to pay tuition and book costs of college readiness courses.

To complete an application to the College, PSEO students must submit a completed SCTCC Graduation Plan. PSEO students are accepted to courses and majors on a space available basis. Some courses may be blocked from PSEO student enrollment.

Students will need to meet each semester with their PSEO advisor to select courses and to provide a PSEO notice of student registration.

PSEO Books

The costs of books and tuition will be covered by the PSEO program. PSEO students are not charged fees for the use of books. However, the books are the property of the college and must be returned to the college book store by the last day of finals week each semester or the student will be required to make payment for the books. PSEO students withdrawing from the college should return their books immediately. Books will be available to PSEO students prior to the start of the semester. PSEO students will need a book authorization form to obtain their books. The form is available at admissions.

PSEO Parking

PSEO students are personally responsible to pay a \$3 per credit fee to park on campus. The parking fee is due by the beginning of each semester; paid at the Financial Services Office. A parking permit will be issued at the time of payment. PSEO students electing not to park on campus may have the parking fee waived by stopping by the Financial Services Office. Parking fees must be paid or waived prior to obtaining books.

PSEO Academic Requirements

PSEO students must maintain a cumulative GPA of 2.0 or better (C average). If a PSEO student's GPA falls below 2.0 the student will be ineligible to continue PSEO enrollment for one semester immediately following the occurrence. In addition, the student will be placed on Academic Warning with the College and will be required to meet with a counselor to form an Academic Success Plan prior to registration for another semester. A copy of PSEO students' class schedules and grades for those classes are sent to the students' high school each semester.

Students requesting supplemental support services may access 2.5 hours a week of supportive instruction. If additional accommodations are required the school district and the College will negotiate for the provision of services. Contact the PSEO coordinator for specific information.

For PSEO state statute, refer to MN Statute 124D.09.

IMMUNIZATION POLICY

Minnesota Law (MS 135A.14) requires that all students born after 1956 and enrolled in a public or private postsecondary school in Minnesota must provide evidence of immunization for measles, rubella, mumps, diphtheria, and tetanus. Students graduating from a Minnesota high school after 1997 are not

required to provide documentation.

Forms for this purpose and additional information are available from the Admissions Office. Students may also submit immunization records maintained by their high school or health care provider. Proof of immunization must be received no later than the 45th day of the term, or the student will not be allowed to register for subsequent terms.

MINNESOTA STATE RESIDENCY

(Minnesota State Policy 2.2 and M.S. 135A.031, sbd2.)

Students may establish eligibility for in-state tuition by demonstrating domicile in Minnesota before the beginning of any term. Students must have resided in Minnesota for at least one calendar year immediately prior to applying for in-state tuition. Residence in Minnesota must not be for educational purposes. Students must provide sufficient evidence of domicile. Resident Tuition Classification Request forms are available in the Admissions Office. Requests submitted without documentation will be returned to the student unprocessed. Students will receive a written response by mail within 30 days of their request.

SECURITY AND CRIME REPORTING

Campus security and safety is a high priority at SCTCC. Providing students with a safe environment in which to learn and keeping students, parents and employees well informed about campus security is important to the College. SCTCC complies with the collection and reporting of all campus crime as per the requirements of the *Crime Awareness and Campus Security Act of 1990 (Clery Act)*. Copies of this report are available through the Admissions Office or via the college's website at www.sctcc.edu/safety.

ACADEMIC POLICIES

ABILITY TO BENEFIT POLICY (ATB)

Students who do not possess a high school diploma or GED certificate will not be eligible to receive financial aid. The ATB is a standardized, federally approved test. Persons who do not have a high school diploma or GED may take the Accuplacer test at St. Cloud Technical and Community College to determine their ability to benefit from instruction. This policy does not restrict a student from enrolling in programs at St. Cloud Technical and Community College, but does apply to receiving financial aid. For more information, please contact the Admissions Office at (320) 308-5089.

ACADEMIC FORGIVENESS

Academic Forgiveness may only be granted once and is limited to St. Cloud Technical and Community College coursework.

Students who have earned a cumulative grade point average of less than 2.0 may have the grades earned during that period of attendance forgiven. A student seeking academic forgiveness:

- May not be enrolled at St. Cloud Technical and Community College for at least three years prior to re-enrollment.
- Must complete one term of full-time enrollment or equivalent with a grade point average of 2.0 after re-enrollment.
- Must petition for academic forgiveness.

If students meet the criteria listed above, Records and Registration will make the following changes to the student's academic transcript: All D or F grades earned in courses taken prior to the date of forgiveness will remain on the transcript, but will no longer calculate in the GPA.

Academic Forgiveness does not extend to financial aid. All credits and all grades attempted will be included when determining satisfactory academic progress for financial aid purposes.

ACADEMIC INTEGRITY

Academic dishonesty is considered a disciplinary offense under St. Cloud Technical and Community College's Student Code of Conduct. Academic dishonesty is defined as the submission of false academic records, cheating, plagiarism, altering, forging, or misusing a college academic record, acquiring or using test materials without faculty permission, acting alone or in cooperation with another to falsify records or to obtain dishonest grades, honors, or awards. Any acts of academic dishonesty will be subject to disciplinary action and could result in sanctions as described in the College's Student Code of Conduct. Students are ensured due process in academic misconduct situations.

ACADEMIC STANDING (SATISFACTORY ACADEMIC PROGRESS)

See Minnesota State Policy 2.9 and Procedure 2.9.1 In accordance with federal and state regulations and Minnesota

State Policy 2.9, St. Cloud Technical and Community College monitors all credits for all students and applies the following minimum cumulative standards of progress beginning with the student's first attempted credit. All students must:

- Meet or exceed a cumulative earned grade point average (GPA) of 2.00

AND

- Meet or exceed a cumulative earned percentage of 67% of all attempted credits.

A student who does not meet this standard will at the end of the term be placed on academic and financial aid warning. A success plan must be completed by students on warning status. Students on warning who do not achieve a cumulative 2.0 GPA and 67% completion rate during their next term of enrollment will be suspended at the end of the term. A student on suspension is not eligible to enroll or receive financial aid.

An initial academic suspension is for a period of one regular semester (excluding summer). Any subsequent academic suspension(s) will be for one full academic year.

Notification: Students failing to maintain the academic progress standards listed above are notified in writing of warning or suspension and the process to appeal suspension status.

Maximum time frame for financial aid recipients: Students may continue to receive financial aid through 150% of the published credit length of their declared program. Example: 150% of a 60-credit AA degree equals 90 credits. Changing a major will not extend a student's maximum time frame.

Appeals: A student may appeal suspension or maximum time frame based on unusual or extenuating circumstances, including but not limited to death of a family member or student injury or illness. Documentation must be provided to support an appeal. The student is notified of the appeal results by letter.

Students with an approved suspension appeal are placed on probation and must meet the cumulative satisfactory academic progress standards (cum GPA of 2.00 and 67% credit completion) or meet or exceed the term GPA of 2.5 and the term completion rate of 100%. Probationary students failing to meet one of these standards will at the end of the term be suspended.

Reinstatement: A student on warning status is reinstated with academic good standing upon meeting or exceeding the minimum cumulative standards of academic progress. A suspended student may have eligibility to enroll and financial aid reinstated only after an appeal has been approved. Neither paying for one's own classes nor sitting out a period of time is sufficient in

and of itself to reestablish eligibility for enrollment or financial aid.

- View the full SCTCC Satisfactory Academic Progress Policy at: sctcc.edu/SAP
- Visit www.minnstate.edu/board/policy/209.html
- The Academic Standing Appeal Form can be found at: www.sctcc.edu/academic-standing .

AUDITING CLASSES

Students who wish to attend the class sessions of a course, but do not wish to receive credit, must register for audit. The same registration procedure is followed and the same tuition and fees are charged. Students are expected to attend classes, but the taking of tests is optional. Audited courses do not affect the grade point average. Financial aid and veterans' benefits will not pay for audited courses.

“Course Audit Application Forms” can be obtained from Records and Registration and must be returned during the free enrollment period. Students are responsible for obtaining the required signatures. Students will not receive credit for a course which was audited unless the course is retaken for credit.

COLLEGE READINESS ASSESSMENT

See Minnesota State Policy 3.3

St. Cloud Technical and Community College requires all applicants, unless exempted, to complete a Minnesota State approved academic assessment test before registering for classes. SCTCC uses the Accuplacer test. (Students who have taken the ACT test within three years may be exempt from taking the Accuplacer test). This assessment must be completed within 30 days of acceptance. Failure to take the assessment within this time frame may result in application cancellation. A letter and brochure about the test will be mailed at the time the student is accepted to the college. College readiness courses will be required of students earning scores below the minimum standards in Reading Comprehension and Math. Students may retest one or all parts of the test. A fee will be assessed for each retest.

Accuplacer

Generally, students must achieve the following minimum scores on the Accuplacer test sections to take general education or general studies classes.

	Gen. Education	Gen. Studies
Reading Comprehension	78	62
Arithmetic	<i>scores set by major</i>	
Elementary Algebra	<i>Varies by Course</i>	

Students applying for programs with selective admissions criteria may be required to take additional tests. College readiness courses and program prerequisites must be completed before acceptance into programs with selective criteria.

Placement Test Exemptions

Students wishing to be exempted from Accuplacer testing must meet the following conditions:

- ACT reading subject area test scores of 21 or higher and ACT mathematics subject area scores of 22 or higher will exempt students from taking related Accuplacer sections if taken within three years, inclusive of the current calendar year, for reading and two years for mathematics. An official ACT assessment College Report is required.
- MCA reading subject area test scores of 1047 or higher and MCA mathematics subject area scores of 1150 or higher will exempt students from taking related Accuplacer sections if taken within five years, inclusive of the current calendar year. An official high school transcript with MCA assessment scores or an official MCA assessment score report is required.
- SAT reading subject area test scores of 480 or higher and SAT mathematics subject area scores of 530 or higher will exempt students from taking related Accuplacer sections if taken within five years. An official SAT assessment College Report is required.
- Students who provide official college or university transcripts showing completion of six or more semester credits in reading and writing intensive courses with a grade of C or better may be exempt from taking the Reading portion of the test. Students who have earned these credits more than ten years ago are encouraged to take the placement test.
- Students who provide official college or university transcripts showing completion of three or more semester credits of Intermediate Algebra or higher may be exempt from taking all or part of the Math portion of the test. Students who have earned these credits more than ten years ago are encouraged to take the placement test.
- Students who have earned 30 or more college-level technical semester credits from a regionally accredited institution with a cumulative GPA of 2.0 or better, within the last five years, are exempt from taking the Reading portion of the placement test.

Students with college credits as stated above should send a letter requesting to be exempted and include a copy of the student's college transcript(s), full name, student identification number, current mailing address, phone number, and signature to:

Assessment Center, SCTCC
 1540 Northway Drive
 St. Cloud, MN 56303-1240
 (320) 308-6007

Students will be notified in writing only if they are exempted. The College and programs may require additional tests.

Assessment Tests from other Colleges. Send an official copy of the test results to the Assessment Center at the address listed above at least five weeks prior to registration.

Testing Accommodations. Students who need accommodations on the ACCUPLACER because of a qualifying disability should

contact the Disability Services Coordinator at 320-308-5920 or kplante@sctcc.edu. Documentation of disability will be required. Please request accommodations prior to scheduling your test.

Appeal Procedure. Students who feel their test scores do not accurately represent their readiness for college may appeal the requirement of a college readiness course. To appeal a college readiness course requirement, a student must fill out the appeal form, available in the Admissions Office, and provide any supporting documentation (i.e., transcripts, letters, test scores, etc.) The form and the documentation must be returned to the Admissions Office. The college readiness appeals will be reviewed regularly by an appeal committee. The student will be notified in writing of the committee's decision.

COURSE BY ARRANGEMENT

In extreme cases of schedule conflicts or unusual course demands, students with the approval of the academic deans may take courses by arrangement. Students may not take previously failed courses by arrangement.

CREDIT BY EXAM (TEST OUT)

Test-outs may be written, oral, performance based, an interview or any combination of these. Academic advisors can supply additional information about course requirements and specific tests. The cost for test-out is determined annually and is published on the test-out form. The fees must be paid in the Financial Services Office prior to the exam. The exam fees will not be refunded for students failing to demonstrate the necessary competency. Credit awarded shall be noted on the official student transcript. Test-outs are not allowed if the course has previously been taken for credit or if the student is currently enrolled in the course. Students must be enrolled at St. Cloud Technical and Community College. The test out option is not available for all courses.

CREDIT FOR PRIOR EXPERIENTIAL LEARNING BASED ON LIFE/WORK EXPERIENCE

St. Cloud Technical and Community College students may apply to obtain course credit based on previous relevant life/work experience and learning. Students must document, through a portfolio process, how they have met the learning outcomes for a specific course. This type of credit does not apply toward the residency requirements of a major and will be noted as CR (credit by examination) on the college transcript. A non-refundable fee is charged for each course for which credit is being requested.

CREDIT LOAD

Students registered for at least 12 credits are considered full-time students. Students registered for 9-11 credits are considered three-quarter time students. Students registered for 6-8 credits are considered half-time students. The maximum allowable load without special permission is 20 credits.

Students who wish to enroll for more than the established maxi-

imum must secure permission from their academic advisors. Students wishing to enroll for more than 25 credits must secure permission from their academic advisor and meet with a counselor.

Students are classified according to course credits earned: freshmen = 0 to 30, sophomore = 31 and more earned credits.

DECLARATION OF A MAJOR

To assist with educational planning, it is recommended that non-admitted or visiting students declare a major upon completion of 16 semester credits of coursework as a resident student. Forms to declare a major may be obtained from the Admissions Office. Upon declaring a major, students will be assigned an academic advisor from their program.

GRADING SYSTEM

The achievement of students is recorded using the grades listed here:

- “A” = Superior
- “B” = Very good
- “C” = Average
- “D” = Passing (except specified majors)
- “F” = Failing
- “FN” = Failure due to non-attendance
- “FW” = Failure due to unofficial withdrawal
- “I” = Incomplete
- “IP” = In progress
- “NC” = No Credit
- “P” = Passing
- “W” = Withdraw
- “CR” = Credit by examination. The “CR” is granted to students with advanced standing, test-out or credit by examination.
- “AU” = Audit
- “P” = indicates a “C” or better which means satisfactory progress.

Grade Changes

Grade changes on all courses must be completed by the end of the following term and approved by the academic dean.

GRADE POINT AVERAGE (GPA)

GPA is determined by adding all grade points earned and dividing by the sum of all credits attempted in courses where letter grades of A, B, C, D, or F were received. GPA is computed on a semester and cumulative basis. A semester example is shown below.

Grade	Grade Points	Credits	Points
A =	4.00 x	3 =	12.00
B =	3.00 x	3 =	9.00
C =	2.00 x	4 =	8.00
D =	1.00 x	3 =	3.00
F =	0.00 x	1 =	0.00
TOTAL		14 =	32.00
GPA EQUALS		32/14 =	2.28

GRADUATION REQUIREMENTS

The college Graduation Requirements Policy governs the awarding of certificates, diplomas and degrees and is based in part on Minnesota State policy 3.17 Degrees, Diplomas and Certificates. Students seeking to graduate from St. Cloud Technical and Community College must:

- Satisfactorily complete the required curriculum.
- Earn at least 15 or 1/3 of the technical credits (whichever is less) at SCTCC for a diploma or certificate.
- Earn 20 or more program credits at SCTCC for AAS or AS degrees.
- Earn 20 or more credits at SCTCC for an AA degree.
- Maintain a minimum cumulative grade point average of 2.0.
- Satisfy all general and specific requirements of the college including fulfillment of all financial obligations.
- Submit an Application for Graduation Form at least one (1) term prior to the anticipated date of graduation.
https://webapps.sctcc.edu/online_grad/
- Petition any exceptions to program graduation requirements by requesting course substitution using a Student Petition form. Forms are available in the Financial Services Office.
- Participate in exit counseling if a student loan recipient.

INCOMPLETE

Students who are doing satisfactory work in a course, but cannot complete all requirements, may receive an incomplete "I." An incomplete is given for reasons such as serious illness or family illness. Documentation may be required. Incomplete grades are assigned at the discretion of the course instructor only after the midpoint of the course. The course instructor and the student will develop a contract outlining the remaining work to be done. A signed copy of this contract will be kept on file in the academic division. Students must complete the course requirements within one semester. Incomplete spring semester coursework must be completed by the end of the following fall semester. Incomplete grades that are not changed by the end of the following semester will be changed to "F" for failure.

INTERNSHIPS, PRACTICUMS AND CLINICALS

Many majors include the opportunity for students to participate in off-campus practical work experiences. In many cases these work experiences are required. The College may assist the student in finding an initial placement site. The College is not responsible for finding alternative off-campus work experience placement following a student's termination from the initial placement site.

Work experience includes the following:

- Internships
- Practicums
- Supervised occupational experience, clinical, training associations, and other off-site work experiences.

PROGRAM COMPLETION OPTIONS

It is the student's choice to earn a Certificate, Diploma, Associate

of Applied Science (AAS) degree, Associate of Arts (AA) or Associate of Science (AS) degree. Selecting the right option before registering will save time and money. The following options apply:

Certificate

Student may choose to complete a Certificate. This is the most basic program option and requires successful completion of the fewest number of credits. It will allow students to gain a skill that may lead to employment.

Diploma

A Diploma is a comprehensive program with extensive technical coursework to help develop job skills that will lead directly to employment. Students will choose a specific area of study and will complete their education in one or two years. The curriculum also includes general studies and general education courses. Before making a choice, students should be aware that general studies courses do not meet the Minnesota Transfer requirements. At the discretion of the receiving institution, these courses may be accepted as electives. Applicants are encouraged to check in advance if they intend to transfer to a four-year college or university.

Associate of Applied Science Degree (AAS)

An Associate of Applied Science degree allows students to take not only program specific courses, but their degree will also include at least 15 credits of transferable general education courses selected from at least three of the ten goal areas of the Minnesota Transfer Curriculum. The general education credits may transfer to a four-year college or university. St. Cloud Technical and Community College has articulation agreements with a variety of colleges and universities that will improve transferability upon completion of the degree. All AAS degrees will take at least two years to complete.

Associate of Science (AS)

This degree option combines technical education with at least 30 general education credits. An Associate of Science degree is awarded upon completion of a 60 - 64 credit academic program in scientific, technological, or other professional fields. The Associate of Science degree requires a minimum of 30 general education credits selected from at least six of the ten goal areas of the Minnesota Transfer Curriculum. An Associate of Science degree is designed to transfer in its entirety to a related Baccalaureate program by way of an articulation agreement.

Associate of Arts (AA)

An Associate of Arts degree is awarded upon completion of a 60-credit academic program in the liberal arts and sciences. This includes completion of the 40-credit Minnesota Transfer Curriculum, a wellness requirement and elective credits. It is designed for transfer to baccalaureate degree-granting institutions.

General Education Course Transfer

The Minnesota Transfer Curriculum is the means by which

students transfer their completed lower division general education work at one public college or university to meet lower division general/liberal education requirements at any public college or university in Minnesota. For more information about the Minnesota Transfer Curriculum, goal areas, and content visit their website at www.mntransfer.org.

PROGRAM OPEN ENROLLMENT

Programs and courses that have seats available are open for enrollment before the start of each semester. Some programs require courses to be taken in sequence and starting a program out of sequence may extend the time required to complete the degree/diploma. Not all courses are offered every semester.

REPETITION OF COURSES

A student may repeat courses in an effort to improve their grades. The highest grade earned will be used in calculating the student's grade point average (GPA). Repeating a course more than once will result in the removal of only one previous grade from the GPA calculation. Regardless of the grade earned, students may only repeat a course two times.

All course attempts will remain on the student's permanent academic record and may affect satisfactory academic progress.

NOTE: Some majors may have more restrictive policies for repetition of courses. Students may repeat courses at their own discretion. However, financial aid or veteran's assistance funding may not be available if the repeated course has already been completed satisfactorily.

SERVICE LEARNING

Service Learning is a type of experiential learning that engages students in service within the community as an integrated part of a course. Effective service learning courses involve students in course-relevant activities in partnership with a community organization.

STUDENT SERVICES

ACADEMIC ADVISING CENTER

Academic advising is an integral part of a student's educational experience. It is an ongoing and collaborative process between the student and advisor each semester to assist in the development of an educational plan that is compatible with the student's interests, abilities, and career goals.

Some students will be assigned a faculty advisor from their major and other students will be assigned to the advisors in the Academic Advising Center. The Academic Advising Center can work in partnership with faculty advisors to provide information to all students.

Faculty advisors provide students with program specific course selection, industry and career information, course content information, and internship and clinical guidance.

The Academic Advising Center is available to assist students with information regarding liberal arts courses, transfer planning, initial advising questions, and major exploration. The Academic Advising Center is also assigned as advisors for students in the Associate of Arts degree, pre-health, and pre-nursing programs.

Both faculty advisors and advisors located in the Academic Advising Center can provide students with academic guidance and planning, initial registration or scheduling questions, and information about campus resources and policies.

Call (320) 308-5741 to schedule an appointment with the Academic Advising Center. Additional information is available at: www.sctcc.edu/advising.

CAREER SERVICES

SCTCC provides free career placement assistance to all students and graduates. While the primary responsibility of employment rests with the individual, the Career Center provides active support in helping both students and graduates initiate their careers. The Career Center, located in the main building, room 1-448, provides a variety of reference materials, career and employer information, computers with internet access, a fax, and a telephone for students and graduates use.

The professionally staffed office provides student support by:

1. Assisting students with part-time, full-time and internship employment opportunities.
2. Assisting with personal, career-related needs including job seeking skills, mock interviews, labor market information, relocation assistance, job development, and cover letter/resume development.
3. Employer development to maximize employment opportunities for students.

4. Planning and facilitating events that enhance career opportunities for students, such as on-campus interviews, employer visits, and hosting an annual job fair for SCTCC students and graduates.
5. Following up with graduates to obtain placement data to meet state reporting requirements and provide consumer information to prospective students, legislators, high school counselors, and other interested people.

For additional information and/or to review placement data summaries by major, and listings of SCTCC graduates' past employers, call (320) 308-5926 or go to: sctcc.edu/career-services.

THE MARY STANGLER CENTER FOR ACADEMIC SUCCESS (CAS)

The Mary Stangler Center for Academic Success (CAS) offers learner-centered tutoring services to all students enrolled at SCTCC. The CAS is located in room 1-112 and is open from 7:30 am to 5:00 pm, Monday - Thursday and from 7:30 am to 3:00 pm on Fridays during the academic year (summer hours vary).

The CAS's goal is to provide academic assistance in a supportive setting so students may make their studies more efficient and successful. Professional staff and peer tutors support students with both technical and general courses through one-on-one and small group contact. Students may drop in, schedule an appointment, or be referred by faculty, counselors, and student service staff.

Services provided by the CAS are free to all students enrolled at St. Cloud Technical and Community College. Tutors help by clarifying textbook assignments, discussing ideas, and reviewing practice problems. Tutors explain and model but do not complete assignments or proofread/edit papers. Tutors for math and writing are always on staff, while schedules for the following additional subjects are posted inside the CAS:

- accounting
- logic
- computer programming
- basic computer courses
- physics
- ethics
- critical thinking
- spanish
- energy and electronics

Along with these core courses, students may request assistance in nearly any other course in which they are enrolled. For students' convenience, the tutoring services of the CAS are delivered mainly on a drop-in basis; however, individual tutori-

als may be scheduled for certain courses. Synchronous and asynchronous online tutoring is also available for math, science, and writing assignments.

The CAS also offers individual coaching on common academic skills that students may need to brush up on or learn about. Students work one-on-one with an academic coach to help them sharpen their skills so they can become a better student in all of their academic classes. Examples of areas that are included are:

- motivation towards academic goals
- performance on exams/test nervousness
- time management/organization
- general academic performance
- note taking skills
- reduction in anxiety
- reading comprehension
- memory techniques

Please visit the CAS Website (www.sctcc.edu/cas) for more information about our services and recommended tutoring and learning resources.

CHILD CARE

On-campus child care is available for students. Parents must enroll their children before they are allowed to attend the child care center. Enrollment and fee structure information may be obtained by calling the Campus Playhouse at (320) 534-0174. The center operates from 6:00 am to 6:00 pm. The center has a 4 star Parent Aware rating, the highest rating possible. Child care grants may be available through the Financial Aid Office.

DISABILITY SERVICES

See Minnesota State Policy 1B.4

Disability Counseling and Services, in collaboration with the college community provides equal educational access and opportunity for all qualified students with disabilities to participate in St. Cloud Technical and Community College programs, services and activities. Access means that a qualified individual with a disability will not be excluded from participation in, or be denied the benefits of the services, programs, or activities, nor will the individual be subjected to discrimination.

SCTCC will provide reasonable and appropriate accommodations to qualified students with disabilities, assist students with disabilities in self-advocacy, educate the college community about disabilities and ensure legal compliance with state and federal disability law as well as Minnesota State policy 1B.4. Disability services will strive to: provide safe, confidential support services to students with disabilities; determine the implications of a student's disability and recommend appropriate accommodations which address the student's needs; and encourage self-determination, independence and personal responsibility for students with disabilities.

Appropriate and reasonable academic accommodations are determined on an individual basis. Accommodations must be specific to the disability need. Sufficient advance notice is required by qualified students when requesting accommodations. Some accommodations may require a 6 week notice to arrange. In accordance with the Americans with Disabilities Act and Amendments Act (ADAAA), accommodations will not be provided 1) for personal daily living devices or services even though the individual may be a qualified individual with a disability, or 2) that result in a fundamental alteration in the nature of a service, program or activity or in undue financial or administrative burdens. Denial of requested accommodations or services can be appealed by contacting the Office of the Vice President of Academic & Student Affairs at St. Cloud Technical and Community College.

For Further Information Please Refer to:

- Minnesota State Policy 1B.4
- St. Cloud Technical and Community College Student Handbook
- www.sctcc.edu/disability-services

Or Contact:

Kerby Plante
KPlante@sctcc.edu
SCTCC, 1540 Northway Drive
St. Cloud, MN 56303
(320) 308-5920

DIVERSITY SERVICES/MOSAIC

Mosaic is a state-funded program that offers support services to students of color, first generation college students and low-income students. Following is a list of some of Mosaic's offerings.

- Mosaic Fast Track summer program for ESOL students
- Book loans
- Advising
- Financial Aid Services
- Career Counseling
- Scholarships

The goal is to attract, support, retain and celebrate all of our students and the communities from which they come, and to ensure a welcoming climate for teaching and learning. Contact Admissions for more information at (320) 308-5089.

ESOL SERVICES

In addition to offering ESOL courses, SCTCC employs two Underrepresented/ELL Advisors to offer advising and registration support to ESOL students. Our staff support ESOL students by offering extended advising sessions and assistance through the admissions and registration process. Students also have access to tutoring in the Center for Academic Success while enrolled in their courses. More information on ESOL services is available by contacting 320-308-5014.

HOUSING

The Admissions Office provides a housing list to help students locate living quarters such as apartments, dorm rooms and single family dwellings. St. Cloud State University and St. Cloud Technical and Community College also have a cooperative agreement to provide residence hall space for SCTCC students. Contact the Admissions Office (320) 308-5089 for more information as soon as you are accepted to St. Cloud Technical and Community College.

LIBRARY

The Library is the College's center for reference and research services. The print and non-print collections are accessible through MnPALS Plus, an integrated library catalog system; MnLINK, the statewide virtual library; and WorldCat, a worldwide library catalog. Inter-library loan services are available for borrowing materials located at other libraries. Through participation with Minitex and CMLE (Central Minnesota Libraries Exchange), access and delivery of materials is provided free to library users.

EBSCO eBooks, an extensive electronic book collection, can be accessed and read online while on or off-campus. The electronic subscription databases contain thousands of full-text articles and abstracts from journals, magazines and newspapers, with coverage extending throughout the disciplines.

The library provides an inviting environment for research, quiet or group study, and leisurely reading. It has individual and group study rooms, comfortable seating, study carrels, computer stations, equipment for video viewing, a photocopier, printers, laptop drop stations, and wireless computer capability.

Fall and Spring Hours:

Monday - Thursday: 8:00 a.m. to 7:00 p.m.

Friday: 8:00 a.m. to 4:00 p.m.

Summer Hours:

Monday - Thursday: 8:00 a.m. to 4:00 p.m.

Friday: Closed

Closed Saturday, Sunday, and Holidays

Library tours, classroom presentations, and individual research assistance are available upon request. To access library website, go to www.sctcc.edu/library.

STUDENT IDENTIFICATION CARD

The SCTCC Cyclone Card Office (room 1-131A) dispenses student IDs. Student ID cards serve a dual purpose. Used for "Cyclone Cash," your SCTCC ID card comes with a stored-value account which you may use to make purchases throughout the campus. The card can be used as a debit card if it is associated with US Bank. This is an optional service available to students.

As your official student ID, it's also your access to Learning Resources Center material, Student Health Services, off-campus recreational facilities, and a variety of other products and services that offer student discounts.

STUDENT LIFE/SPORTS/RECREATION

The Student Senate and the Student Activities Coordinator are located in the Student Center. Information about recreational and extra-curricular activities is available in the Student Center. Sports available to students include: women's volleyball, women's basketball, men's basketball, men's baseball, and women's softball.

Additional information on student life can be found in the Student Handbook. www.sctcc.edu/student-handbook.

STUDENT RIGHTS, RESPONSIBILITIES AND CONDUCT

St. Cloud Technical and Community College is committed to the creation and maintenance of an academic community which fosters the intellectual, personal, social and ethical development of its students. The College expects that each student will obey the laws enacted by federal, state and local government. In addition, there are certain rules and regulations governing student conduct which have been established by St. Cloud Technical and Community College and the Minnesota State Colleges and Universities Board of Trustees (Minnesota State).

A number of offenses are defined by the St. Cloud Technical and Community College Student Code of Conduct as disciplinary by the College. They include violations that range from academic violations to disruptive conduct. The College reserves the right to review student behavior that occurs off campus if the behavior violates college policy and is of principle interest regarding the College.

The College is committed to due process in investigating complaints of conduct violations. Where students are found to be responsible for code violations, a variety of sanctions may be applied by the conduct officer. Sanctions may include anything from warning up to and including suspension from the college.

The entire Student Code of Conduct is included in the Student Handbook, and on-line at www.sctcc.edu/student-handbook. It is important for students to familiarize themselves with it.

TRIO - STUDENT SUPPORT SERVICES

TRIO-SSS is a federally funded student support program that offers a variety of free academic services for:

- income eligible students,
- students with disabilities,
- first generation college students whose parents do not have a baccalaureate degree.

TRIO staff help students graduate successfully by:

- developing academic and career plans,
- providing academic advising,
- preparing new students for a successful college experience through the Summer Institute, and arranging peer and group tutoring/mentoring for students' academic success.

See the Student Handbook for a complete listing of TRIO programs and supplemental support services for students with disabilities.

VETERANS RESOURCE CENTER

The Veterans Resource Center is a place where students can come with questions about a variety of subjects pertaining to his/her benefits as a veteran or a dependent of a veteran. It is located in room 1-133. The Veterans Resource center is typically staffed by the MDVA Central Regional Coordinator three days a week. There are also several student employees in the Veterans Resource Center. In order to best respond to our veterans and military personnel needs, appointments are available to meet with the MDVA Central Regional Coordinator. If you have questions about your eligibility for benefits please contact us.

Laura Lamb
Central Regional Coordinator
MDVA Higher Education Veterans Program
Cell: (320) 493-8153
Email: laura.lamb@state.mn.us

Anita Baugh
VA Certifying Official
Phone: (320)308-5936
Email: abaugh@sctcc.edu

The staff in this office can help you understand your education benefits including:

Federal Tuition Assistance
GI Bill Kicker
MN GI Bill
Montgomery GI Bill
Post 9/11 GI Bill
Scholarships and Grants
State Tuition Reimbursement
Student Loan Repayment Program
Survivor Education Benefits
VA Education Programs

Students may also receive help with other VA programs, Tri-Care Insurance, military and retirement pay, family assistance, personal finance and budgeting, and veteran's employment. Many resources are available.

The Veterans Resource Center is partnered with many other agencies, including:

The Department of Defense
The Veterans Administration
MN Family Programs
The American Legion/S.A. L./Veterans of Foreign Wars,
D.A.V.
Goodwill/Easter Seals

sctcc.edu/veterans-services

FINANCIAL AID

FINANCIAL AID

The student's family has the primary responsibility to pay for an education. Financial Aid is intended to supplement the difference between the cost of education and the expected family contributions. Several financial aid programs are available to help you meet your educational expenses. The Financial Services Office can help you determine the financial aid programs for which you are eligible.

To be eligible for financial aid, students must meet the requirements detailed on the Free Application for Federal Student Aid (FAFSA), enroll as a student working toward a degree or certificate in an eligible program and maintain satisfactory academic progress. The Academic Standing and Financial Aid Satisfactory Academic Progress Policy can be found at www.sctcc.edu/academic-standing. The Financial Services Office determines your eligibility by applying federal guidelines.

STEPS TO RECEIVE FINANCIAL AID

Apply for admission to an eligible program at St. Cloud Technical and Community College. Only students accepted into an eligible program are eligible for financial aid.

- You will need a PIN number to electronically sign your federal financial aid application. To apply for a PIN, go to www.pin.ed.gov. Parents may also apply for a PIN.
- Complete the federal financial aid application, which is also called the Free Application for Federal Student Aid (FAFSA). You can complete the FAFSA on-line at www.fafsa.gov. A paper form is also available at St. Cloud Technical and Community College (SCTCC). The college code for SCTCC is 005534. It takes approximately two weeks to process the on-line application and four weeks to process the paper version.
- After all documentation is received by SCTCC, you will be sent an award notification. Your notification will include the grants and some of the student loan eligibility for which you qualify.
- Separate applications are required for student loans, work study, and the child care grant program. Your award notification will direct you when and where to apply for these funds.

DISBURSEMENT

Financial aid, including scholarships, grants, work study and loans, disburse 2 weeks after the start of each semester. At that point, financial aid first pays off all tuition and fees the student owes the college; then, if there are funds left over, an overage check is available for the student. Excess aid can be paid to the student via direct deposit or check. Most financial aid awards are split evenly between fall and spring semester, except work study earnings, which are paid to the student worker **every two weeks**.

Financial Aid will only be paid for courses actually attended. If

a student registers for a course, then drops the course during the college add/drop period or before the course obligation date, financial aid must be returned for that dropped course. Summer financial aid will be processed separately.

In order to qualify for a MN State Grant, the student's Free Application for Federal Student Aid (FAFSA) must be received by the Federal Processor no later than 30 days after the start of the term. Students whose FAFSA data is received by the Federal Processor after that date will be ineligible for MN State Grants for the term.

TYPES OF FINANCIAL AID

GRANTS

Grants are gift aid which you do not have to pay back.

Federal Pell Grant

Undergraduate students may apply for the Federal Pell grant by completing the Free Application for Federal Student Aid (FAFSA).

Federal Supplemental Educational Opportunity Grant (FSEOG)

This federal program is designed for students who have exceptional financial need. Students must be Pell eligible.

Minnesota Grant

This is a grant for Minnesota residents who are attending an accredited post-secondary institution.

Post-Secondary Child Care Grant

This is a grant for Minnesota residents to help offset the cost of daycare to attend college.

Miscellaneous Scholarships

A scholarship is money that does not need to be repaid. Scholarships are made possible through the generosity of private parties. A list of various scholarship resources can be found at www.sctcc.edu/scholarships.

WORK-STUDY

Work-study is employment for students both on and off campus. Pay is determined in accordance with the minimum wage laws. These programs provide for up to 20 hours of employment per week. Total work-study earnings are limited and based on need as determined by the FAFSA application.

LOANS

Loans are financial aid that must be paid back with interest.

William D. Ford Federal Direct Loan Programs: Subsidized

A federally subsidized, low-interest student loan, funded by the

federal government and awarded on the basis of financial need. The federal government pays the interest on subsidized loans, while borrowers are enrolled at an eligible school at least half-time, during the six-month grace period, or during authorized periods of deferment.

William D. Ford Federal Direct Loan Programs: Unsubsidized

A low-interest loan for students who do not meet the financial-need criteria for a subsidized loan. The borrower is responsible for all interest charges on the loan, which is funded by the federal government. Interest charges begin when the first loan distribution is processed.

William D. Ford Federal Direct Loan Programs: PLUS

An education loan which parents can borrow on behalf of their dependent children.

VETERANS ASSISTANCE

Funding may be available if you are a member of the National Guard or Reserves, if you are a veteran of the U.S. Armed services, or a dependent or spouse of a disabled or deceased veteran. You will need to provide a copy of your schedule to the Financial Aid Office each semester to receive funding. Please see the staff in the Veteran’s Resource Center if you have questions related to your eligibility.

ENROLLMENT STATUS

Full Time	12 or more credits
3/4 Time	9-11 credits
1/2 Time	6-8 credits
less than 1/2 time	1-5 credits

The Minnesota State Grant requires 15 credits to be a full time student. Enrollment is determined at the end of the add/drop period, 12 credits is full-time for all other types of aid.

For additional information contact the Financial Aid Office by phone at (320) 308-5961 or by e-mail at financialaid@sctcc.edu. Additional information is available at www.sctcc.edu/financial-aid.

RECORDS AND REGISTRATION

REGISTRATION & STUDENT RECORDS

The Office of Records and Registration is responsible for maintaining the student record system and for the publication of the course schedule. This office is additionally responsible for the release of transcripts, the awarding of degrees, diplomas, and certificates, and transfer of credit. Any questions regarding adding and dropping classes, transfer of credit and graduation, should be directed to Records and Registration. The web site, www.sctcc.edu/records provides important registration information.

REGISTRATION SESSIONS

All accepted students are required to attend an Advising and Registration session where they will be advised on course selection before enrolling in college courses. To register for courses, students must have completed a course placement test or been informed they are exempt from testing. St. Cloud Technical and Community College will provide directions and deadlines for completing the Advising and Registration session.

Any student who has not attended classes for one year or longer will be required to re-activate their file with the Admissions Office and attend an Advising and Registration session. Students who have not attended classes for one semester must meet with their academic advisor prior to registration.

Registration Process for Continuing Students

Degree seeking students who are currently enrolled at the College will be eligible for priority registration for the following semester.

Students are encouraged to review course information at www.sctcc.edu prior to the meeting with their advisor. The advisor will review the program plan with the student to ensure registration for appropriate courses and to be sure that prerequisites and other educational requirements have been met.

Students should also be sure that there are no registration holds on their account which would prevent registration.

Note: Students who are on academic warning or academic probation must complete an academic success plan prior to registration. You can find the success plan at: www.sctcc.edu/success-plan. Students on academic warning must meet with their advisor and students on academic probation must meet with a counselor to review their completed success plan.

Returning Students

Students who have voluntarily “stopped out” (not attended classes) for one semester must meet with their academic advisor prior to registration.

TRANSFER OF CREDIT POLICY

Credits for transfer from Minnesota State colleges and universities shall follow the Minnesota State Undergraduate Transfer policy 3.21 and Policy 3.37 Minnesota Transfer Curriculum. Transfer evaluations are completed in the office of Records and Registration once the student has been accepted into a major. Students must provide an official transcript from all previously attended colleges. Students may also be asked to provide additional documentation of courses taken (course descriptions, course outlines or syllabi). Students will receive a list of courses transferred once the transfer evaluation is complete. Students may appeal the decision of the transfer credit evaluation as outlined in the Minnesota State Undergraduate Transfer Policy beginning with the appeal procedure listed below.

Accreditation:

SCTCC will consider for transfer those credit courses taken from colleges and universities that are accredited by regional or national accrediting agencies.

Age of Credits:

Transfer of technical courses shall be allowed for courses that have been completed within the last 5 years (may be extended if an academic award was received and the student is working in the field). Specific or required math and science courses have a 10-year age limit. Other general studies and general education courses have no age limit.

Course Content:

Courses approved for transfer must match at least 75% of the content and goals of the course syllabus for which the student is seeking transfer. Content and goals from several courses can be combined to reach the 75% match.

Grade Point Average:

Grades earned at other institutions shall not be used in computing the GPA at St. Cloud Technical and Community College.

Grade Requirements:

Courses for which students receive a grade of “C” or higher shall be considered for transfer. Courses with a grade of D that are assigned to a goal area of the Minnesota Transfer Curriculum will also transfer but may not satisfy major or program requirements.

Number of Credits:

The number of credits granted shall not exceed the number of credits awarded by the sending institution.

Semester Conversion:

The following formula is used to calculate the conversion: 3 quarter hours become 2 semester hours and 4 quarter hours become 2.67 semester hours ($4 \times .667=2.668$).

Residency Requirements:

Diploma students must earn 1/3 of the technical/program credits at St. Cloud Technical and Community College. AS and AAS students must earn a minimum of 20 technical/program credits at SCTCC. AA students must earn a minimum of 20 of the required credits for the degree at SCTCC.

Transfer Appeal Process

If a student is not satisfied with the outcome of the above Transfer of Credit process, the appeal process is as follows:

1. Meet with the Registrar to provide clarification of the transfer. The clarification process involves faculty input and evaluation of the course description. The Registrar may require the student to produce a copy of course outlines or syllabi, and may do additional research on the course in question. The Registrar may or may not transfer additional classes after this meeting. If the student is not satisfied with the end result of this meeting, they may proceed to the next step.
2. A written appeal submitted to the Vice President of Academic and Student Affairs regarding the result of the transfer. The Vice President of Academic and Student Affairs will examine what courses have been completed and determine if any further action is necessary.
3. If a student is not satisfied with the college transfer appeal decision, the student may submit a request to the Minnesota State Senior Vice Chancellor of Academic and Student Affairs for a system level appeal of the college transfer appeal decision.

DATA PRACTICES POLICY

Minnesota State Colleges and Universities comply with the Family Education Rights and Privacy Act (FERPA), 20 U.S.C. §1232g, 34 CFR 99; the Minnesota Government Data Practices Act, (MGDPA) Minn. Stat. Ch 13, Minn. Rules CH 1205; and other applicable laws and regulations concerning the handling of education records. Accordingly, the college adopts the following policy:

Student means an individual currently or formerly enrolled or registered, applicants for enrollment registration at a public education agency or institution or individuals who receive shared time education services from a public agency or institution. All students at a post-secondary school have the same rights regarding their educational data regardless of age.

Educational data or education records means data in any form directly relating to an individual student maintained by a public education agency or institution or by a person acting for the agency or institution.

Educational records do not include:

- (1) Financial records of the student's parents or guardian;
- (2) Confidential letters or statements of recommendation placed in education records before January 1, 1975, or after January 1, 1975, if the student waived right of access;
- (3) Records of instructional personnel that are kept in the sole possession of the maker and are not accessible or revealed to any other individual except a temporary substitute for the maker and are destroyed at the end of the school year;
- (4) Records of law enforcement units (if law enforcement unit is a separate entity and the records are maintained exclusively by and for law enforcement purposes);
- (5) Employment records related exclusively to a student's employment capacity (not employment related to status as a student, such as work study) and not available for use for any other purpose;
- (6) Medical and psychological *treatment* records that are maintained solely by the treating professional for treatment purposes;
- (7) Records that only contain information about a student after that individual is no longer a student at the institution (alumni data).

Consent for Release Generally Required

The college will not permit access to or the release of personally identifiable information contained in student education records without the written consent of the student to any third party, except as authorized by the MGDPA and FERPA or other applicable law.

Release without Consent

As allowed by the MGDPA and FERPA, the college will release student records *without consent* as follows:

- (1) To appropriate school officials who require access to educational records in order to perform their legitimate educational duties (see explanation below);
- (2) To federal, state, or local officials or agencies authorized by law;
- (3) In connection with a student's application for, or receipt of, financial aid;
- (4) To accrediting organizations or organizations conducting educational studies, provided that these organizations do not release personally identifiable data and destroy such data when it is no longer needed for the purpose it was obtained;
- (5) In compliance with a judicial order or subpoena, provided a reasonable effort is made to notify the student in advance unless such subpoena specifically directs the institution not to disclose the existence of a subpoena;
- (6) To appropriate persons in an emergency situation if the information is necessary to protect the health or safety of the students or other persons; or
- (7) To an alleged victim of a crime of violence (as defined in 18 U.S.C. Sect 16) or non-forcible sex offense, the final results of the alleged student perpetrator's disciplinary proceeding may be released;

(8) To another educational agency or institution, if requested by the agency or institution, where a student is enrolled or receives services while the student is also in attendance at the college or university, provided that the student is notified where applicable; receives a copy of the record, if requested; and has an opportunity for a hearing to amend the record, as required by law.

“School Officials” with a “legitimate educational interest”

The college will release information in student education records to appropriate school officials as indicated in (1) above when there is a legitimate educational interest. A school official is a person employed by the college in an administrative, supervisory, academic or research, or support staff position (including law enforcement unit personnel and health staff); a person or company with whom the University has contracted (such as an attorney, auditor, or collection agent); a person serving on the Board of Trustees; or a student serving on an official committee, or assisting another school official in performing his or her tasks. A school official has a legitimate education interest if the official needs to review an education record in order to fulfill his or her professional responsibility.

Public Directory Information: The following information on students at college is designated as public Directory Information:

- (1) Student’s name, hometown
- (2) Participation in officially recognized activities and sports
- (3) Dates of attendance (beginning and end dates of the semester)
- (4) Classification (freshmen, sophomore)
- (5) Degrees, honors and awards received
- (6) Date of graduation
- (7) Physical factors (height and weight) of athletes
- (8) Photographs
- (9) Enrollment status (e.g., undergraduate, graduate, full-time, or part-time)

Limited Directory Information for internal use within SCTCC and Minnesota State includes students’ college e-mail address. This is not released to outside entities but is available to students, faculty and staff within Minnesota State and SCTCC.

Notice to students about Directory Information:

Students may direct that all of the above-listed Directory Information be withheld from public disclosure by notifying the Records and Registration Office in writing.

Access to Educational Records by Student

Upon (written) request, the College shall provide a student with access to his or her educational records. There is no charge for viewing the records even if the college is required to make a copy of the data in order to provide access. Responses to requests by students to review their educational records shall be within ten business days.

Upon request, the meaning of education data shall be explained to the student by college personnel assigned to, and designated by, the appropriate office.

Students have the right to review only their own records. When a record contains private information about other student(s), disclosure cannot include information regarding the other student(s).

Challenge to Record

Students may challenge the accuracy or completeness of their educational records. NOTE: the right to challenge a grade does not apply under this policy unless the grade assigned was allegedly inaccurately recorded.

Copies

Students may have copies of their educational records and this policy. The copies of records will be made at the student’s expense at rates stated in the college copy charge policy. The official transcript fee is \$10.00.

Official copies of academic records or transcripts will not be released for students who have a delinquent financial obligation or financial “hold” at the College, unless otherwise required by law.

FINANCIAL SERVICES

ACCESS/PARKING FEE AND PARKING REGULATIONS

All students must pay a per credit access/parking fee. The fee is determined annually and posted at www.sctcc.edu/tuition. Daily parking permits are \$2. Permits are available in the Business Office.

Access/parking fees will be charged to all St. Cloud Technical and Community College students. The purpose of such fees is for the development and upkeep of the College's parking lots, access road, parking security, associated lighting and sidewalks to the campus, administrative costs associated to access/parking and is used solely for that purpose. All students, regardless of whether their education includes actually parking in the lots, benefit from the establishment and maintenance of the lots. It is an embedded service that allows service providers, students, faculty, staff and administration, security, delivery vehicles, etc., the access to our buildings necessary to complete the mission of the College.

Students enrolled in purely online delivered courses will not be charged. Students on extended internships, or in situations where the student does not park on campus, may formally request a waiver of the fee. A parking permit refund may be obtained from the Business Office on the same prorated basis used to refund tuition upon withdrawal from the College. A \$10 fee will be charged for replacement of lost, stolen or damaged permits. One additional permit may be purchased for \$10. Motorcycle permits will be issued at no extra charge provided a student qualifies for a regular permit.

Access/parking fees are reviewed annually and subject to change. Everyone using the parking lots between 7:00 am and 10:00 pm is required to display a current parking permit from the rear view mirror. No overnight parking is permitted. Vehicles without a properly displayed permit will receive a ticket. Parking is not available in Lot B.

The purchase of a permit does not guarantee the availability of a parking space at all times. Any vehicle parked on the campus is parked at the risk of the owner. The College assumes no responsibility for care or protection of any vehicle or its contents. Unpaid parking tickets will be recorded and will prohibit a student from registering for classes and obtaining transcripts.

PSEO STUDENT PARKING

PSEO students are personally responsible to pay a \$3 per credit fee to park on campus. The parking fee is due by the beginning of each semester; paid at the Business Office. A parking permit will then be issued at the time of payment. PSEO students electing not to park on campus may have the parking fee waived by stopping by the Business Office. Failure to pay the parking fee by the beginning of the semester will result in the assessment of a late fee..

PARKING VIOLATIONS

- Parking in prohibited area fine \$15.
- Parking in grass area fine \$15.
- Misuse of Handicapped Parking Only fine \$200. (handicapped placard or handicapped license plate must be displayed to be eligible to park in the college lot)
- Blocking of Fire Lane fine \$15.
- Altered/forged permit fine \$60.
- Motorcycles should be parked in areas designated as "Motorcycle Parking." (located by Door 10)
- Visitor parking is designated for guests only. Visitor permits are available at the Information Center.

Circumstances under which vehicles will be ticketed and/or towed shall include (but not limited to) the following:

1. Security and parking operations receives a complaint that a vehicle is illegally parked, obstructing traffic, impeding emergency responses and/or college operations, blocking pedestrian traffic, etc.
2. Vehicles parked in such a way to constitute a hazard, impede vehicular and pedestrian traffic, emergency responses and repair, or grounds operations.
3. Vehicles that have been autoclamped for 24 hours will be towed.

Circumstances under which vehicles will be ticketed and autoclamped are:

1. A vehicle displays a permit that has been reported as being lost or stolen, or one which has been altered or forged.
2. A vehicle has been issued three or more unpaid parking citations in the current academic year.
3. Charge for removal of auto clamp is \$60.00.

Appeals Procedure for a SCTCC Parking Ticket

1. Tickets must be appealed within five (5) business days from date of issuance of ticket.
2. The parking appeals committee will meet every other Tuesday from 2:00 pm to 3:00 pm during the academic year to hear appeals.
3. Individuals may present their appeals in writing with the option to be present for their appeal. Appeals will be considered by the committee on a first come, first served basis. Written appeals forms are available in the Business Office.

HEALTH SERVICE FEE

All students must pay a per credit health service fee. The fee is determined annually and posted at www.sctcc.edu/tuition. These funds purchase an accident insurance policy, \$5,000 limit, no deductible, which covers students on campus and at all off campus college sponsored events including internships and

supervised occupational experiences. Since it is a secondary policy, students covered by another policy, will pay for the deductible on their primary policy. Claim forms and a reference copy of the policy are available in the Business Office.

MSCSA FEE

The Minnesota State College Student Association (MSCSA) is the recognized student association for Minnesota technical and community college students. A per credit fee is charged to each student and credited to the association for state-wide representation. The fee is determined annually and posted at www.sctcc.edu/tuition.

REFUNDS, DROPS, WITHDRAWALS, AND WAIVERS, MINNESOTA STATE POLICY 5.12

Students are financially obligated for every class in which they have registered. Students that register for, but do not attend classes at St. Cloud Technical and Community College and fail to formally withdraw, or drop classes within the free drop deadline, will still be responsible for the full tuition amount due. (After the free drop deadline, students must withdraw from ALL courses to receive a pro-rated refund based on the date of total withdrawal. It is the student's responsibility to check their balance due online).

DROP/WITHDRAW

Students must drop courses by using the WEB registration system through the fifth day of the semester or the first business day after the course begins, whichever is later. Courses withdrawn from after the drop period will receive a grade of "W." Students can initiate a course withdraw through 80% of the instructional days for a course.

No tuition refunds will be processed by the Business Office for courses withdrawn from after the drop period. (Students withdrawing from the college, see below)

Students wishing to completely withdraw from the college should obtain a "Withdrawal Worksheet" from the Admissions Office. Students should complete and sign the top portion of the form and return it immediately to the Admissions Office. The date of withdrawal will be the date the completed form is received by the Admissions Office. Student initiated withdrawals are allowed until 80% of the instructional days in the academic semester have elapsed. The Business Office will determine if a refund is appropriate and to whom the refund should be distributed. Questions about refunds should be directed to the Business Office.

Withdrawing from a Course

Students withdrawing from a single course (after the drop period listed above) are not eligible for a refund and will receive a grade of "W." Students can initiate a course withdraw through 80% of the instructional days for a course. Students may withdraw online or a course withdrawal form can be completed in Records and Registration.

Refunds for Total Withdrawal from College

Students who officially and totally withdraw from the College may be eligible for a refund as defined below. Withdrawal forms are available in the Admissions Office. A student who withdraws simply by non-attendance will not be eligible for a refund. When students do not officially withdraw, they will receive the earned grade in each course for which they are registered and will be liable for all tuition and fees for those courses.

Total Withdrawal from College Refund Period

Fall and Spring terms:

1st through 5th class day of term.....	100%
6th through 10th class day of term.....	75%
11th through 15th class day of term.....	50%
16th through 20th class day of term.....	25%
after 20th class day of the term.....	0%

Summer term:

1st through 5th class day of term.....	100%
6th through 10th class day of term.....	50%
after 11th class day of the term.....	0%

Waivers

The College President may waive amounts due to St. Cloud Technical and Community College for the following reasons:

- Employee Benefit Provided by a Bargaining Agreement
- Death of a Student
- Medical Reasons
- College Error or Unsatisfactory Service
- Employment Related Conditions
- Significant Personal Circumstances
- Student Leader Stipends
- Course Conditions

A course condition exists when the location or timing of the course results in the student not being able to use the services intended by a fee. Students will be required to provide documentation with their request.

SENIOR CITIZEN FEE

Residents 62 years or older may register tuition-free for any hour-based courses except for courses designed and offered specifically and exclusively for senior citizens (prerequisites must be met). Senior citizens registering for credit-based courses are required to pay \$20 per credit tuition. If the course is audited, tuition is free. Exceptions may apply. State law states that a senior citizen may take a course "when space is available after all tuition-paying students have been accommodated." This means senior citizens may have to wait until the first class meeting to register. Senior citizens are responsible for all materials, personal property, or service charges for the course, including technology fee, parking fee, MSCSA fee, and health service fee.

STUDENT ACTIVITY FEE

All students (except senior citizens) must pay a per credit student activity fee. The Student Senate uses these funds to sponsor special events for students. A complete budget may be requested from your Student Senate representative. The fee is determined annually and posted at www.sctcc.edu/tuition.

TECHNOLOGY FEE

The purpose of the technology fee is to increase service, quality and/or access to high-end technology. The technology fee will be charged to all students. The fee is determined annually and posted at www.sctcc.edu/tuition.

TRANSCRIPT FEE

Students may obtain an official transcript of their grades by completing a request for transcripts and paying \$10 for each transcript requested.

TUITION AND FEE POLICY

Tuition rates per credit and fees are subject to change according to Minnesota State College and Universities (Minnesota State) and/or college policies. Current tuition and fee rates are posted at www.sctcc.edu/tuition.

TUITION DEFERMENT

SCTCC offers a service for those students who must defer tuition and other college costs, and who do not qualify or are not eligible for agency funding, loans or grants. The College contracts with Nelnet Business Solutions (NBS), a tuition management company that provides a low cost option for budgeting students' college costs. SCTCC/NBS has established several payment schedules requiring various down payment amounts and number of payment dates. Students register online with NBS via the SCTCC web site, www.sctcc.edu.

Scroll down to GET STARTED.

- Click on Pay for College
- Pay Tuition Online
- Login with Username & Password
- Click on Bills & Payments
- Enroll in New Payment Plan

Students will not be allowed to register for a new term if deferred payments from a previous term are not current. Payments may be deferred for only the current semester and the entire balance must be paid in full by the end of that semester. A \$30 processing fee will be charged for each deferment agreement. Deferred payment plans cannot be established or extended for past debt or for students not currently enrolled. Additional information on NBS payment options is available from the Business Office at (320) 308-5572 or (320) 308-5512.

TUITION PAYMENT

Per Minnesota State Policy 5.12, payment of tuition and fees will be due on the established due date posted on www.sctcc.edu homepage. Students whose tuition is unpaid, or do not have other approved financial arrangements in place by this deadline will have their registration cancelled and be denied entrance to class. To avoid registration cancellation, one of the following approved financial arrangements must be in place:

- Tuition/fees paid in full
- Down Payment of 15% of tuition/fees or \$300 through the NBS tuition payment plan
- Financial Aid in place, meaning the FAFSA is complete and

the College has an ISIR on file

- Scholarship or other agency/third party support in place of at least 15% of tuition/fees or \$300 through the NBS tuition payment plan
- A completed PSEO student enrollment agreement on file
- Active I-20 or DS2019 in place for an international student

Students are financially obligated for every class in which they are registered. Students that register for, but do not attend classes at Cloud Technical and Community College and fail to formally withdraw, or drop classes within the free drop deadline, will still be responsible for the full tuition amount due. After the free drop deadline, students must withdraw from ALL courses to receive a pro-rated refund based on the date of total withdrawal. It is the student's responsibility to check their balance due online.

No invoices or tuition statements are mailed. Accounts must be accessed and paid online at: www.sctcc.edu. Scroll Down to GET STARTED.

- Pay for College
- Pay Tuition Online
- Login with Username & Password
- Bills & Payments

Follow the directions provided to pay with Visa, e-checks, Mastercard or Discover credit cards. International students not meeting the payment criteria outlined above will have their registration cancelled after the fifth day of the term.

Students are responsible to ensure that financial aid documents (ISIR with the Financial Aid Office) and agency awards (documents with the Business Office) are complete and on file prior to the deadline date. Students will be allowed to add courses to their schedules through the drop period. Courses added or deleted may affect the balance that a student owes. Students are encouraged to check their account online after any course changes. Course changes may also affect the amount of financial aid that a student is eligible for. Changes may cause payment plan to change.

If a student's account is not paid in full, a hold will be placed on the student's account and a \$50 late fee may be applied. The student will be unable to register for future classes or receive an official transcript until full payment is made. If student's account remains unpaid in full, the account will be turned over to the Minnesota Department of Revenue to collect. Individuals that submit Non Sufficient Fund (NSF) checks will be subject to a \$25 charge and be asked to make restitution by cash, money order or cashiers check. A registration hold will be placed on the student's account. The policy on NSF checks and the fine are subject to change without notice.

Accounting Careers

Accounting AAS Degree (70 Credits)



Program Description

The Accounting AAS Degree at SCTCC offers students a diverse in-depth accounting and business curriculum. The program prepares students to be successful in a variety of accounting careers and for advancement in their current positions. Graduates will learn to be critical thinkers and decision makers who have been taught the most up-to-date accounting practices.

Students completing the Accounting AAS Degree are eligible to take the national Accredited Business Accountant (ABA) accreditation and the State of Minnesota Registered Accounting Practitioner (RAP) accreditation exams. In past years, SCTCC graduates have a pass rate more than double the national average on the national accreditation exam.

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons: national or international program certification, national or international standards including skill standards, standards recommended by a primary employer or multiple employers, national specialized program accreditation, state licensure requirements, and/or national practices or standards.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

The Accounting AAS Degree prepares students to fill accounting roles in public accounting firms, schools, counties, cities, non-profit organizations and every type of for-profit business that needs high quality well trained accounting professionals.

Suggested Technical Studies Semester I

ACCT1215	Accounting Principles I	4
BUSM1260	Applied Business Mathematics/Calculators	3
BUSM2275	Legal Environment of Business.....	3
CPTR1210	Introduction to Computers.....	3

Suggested Technical Studies Semester II

ACCT1216	Accounting Principles II.....	4
ACCT1217	Cost Accounting.....	4
ACCT1219	Spreadsheets-Microsoft Excel	2
ACCT1220	Payroll Accounting	2
ACCT1225	Quickbooks	3

Suggested Technical Studies Semester III

ACCT2225	Computerized Accounting Projects	2
ACCT2226	Intermediate Accounting I	4
ACCT2229	Managerial Accounting.....	4
ACCT2230	Income Tax I.....	4
ACCT2236	Government and Not-Profit Accounting.....	2

Suggested Technical Studies Semester IV

ACCT2227	Intermediate Accounting II.....	4
ACCT2231	Income Tax II.....	2
ACCT2234	Auditing.....	3
ACCT2235	Accounting Comprehensive Review OR	
ACCT2280	Accounting Internship	2

General Education

ENGL1302	Analytical Writing	4
MNTC Goal Area 1 Communications - Oral		3
MNTransfer General Education Electives *		8

*Courses must be from at least 3 Goal Areas

Estimated cost of books, supplies and materials: 2,184

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Accounting Careers

Accounting Diploma (61 Credits)



Program Description

The Accounting Careers diploma prepares students for a variety of accounting positions in public accounting, private industry, and governmental and non-profit organizations. Accounting Careers emphasizes financial analysis, decision making, and ethical behavior and reporting practices. Students will gain experience working with calculators, computers, and the latest computer software. This program will prepare students as accountants for both private and public accounting.

Students graduating with an Accounting Diploma qualify to sit for the Registered Accounting Practitioner (RAP) exam in the State of Minnesota, and the national Accredited Business Accountant (ABA) accreditation exam through the Accreditation Council for Accountancy and Taxation.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

This program will prepare students as accountants for both private and public accounting.

Suggested Technical Studies Semester I

ACCT1215	Accounting Principles I	4
BUSM1260	Applied Business Mathematics/Calculators	3
BUSM2275	Legal Environment of Business.....	3
CPTR1210	Introduction to Computers.....	3

Suggested Technical Studies Semester II

ACCT1216	Accounting Principles II.....	4
ACCT1217	Cost Accounting.....	4
ACCT1219	Spreadsheets-Microsoft Excel	2
ACCT1220	Payroll Accounting	2
ACCT1225	QuickBooks	3

Suggested Technical Studies Semester III

ACCT2225	Computerized Accounting Projects	2
ACCT2226	Intermediate Accounting I	4
ACCT2229	Managerial Accounting.....	4
ACCT2230	Income Tax I.....	4
ACCT2236	Government and Not-Profit Accounting.....	2

Suggested Technical Studies Semester IV

ACCT2227	Intermediate Accounting II.....	4
ACCT2231	Income Tax II.....	2
ACCT2234	Auditing.....	3
ACCT2235	Accounting Comprehensive Review OR	
ACCT2280	Accounting Internship	2

General Education

ENGL1100	Writing for the Workplace	3
	General Studies - Electives	3

Estimated cost of books, supplies and materials: 1,967

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Accounting Careers

Accounting Clerk Diploma (34 Credits)



Program Description

The Accounting Clerk diploma prepares students for long term office positions in bookkeeping and accounting.

An accounting clerk maintains accounting records, posts details of business transactions, reconciles bank statements, prepares vouchers and invoices, and assists management with other accounting duties.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

This program will prepare students as accounting clerks for business and governmental organizations; designated by the type of accounting performed, such as Accounts Payable Clerk, Accounts Receivable Clerk, Billing Clerk, Tax Record Clerk.

Suggested Technical Studies Semester I

ACCT1215	Accounting Principles I	4
BUSM1260	Applied Business Mathematics/Calculators	3
BUSM2275	Legal Environment of Business.....	3
CPTR1210	Introduction to Computers.....	3

Suggested Technical Studies Semester II

ACCT1216	Accounting Principles II.....	4
ACCT1219	Spreadsheets-Microsoft Excel	2
ACCT1220	Payroll Accounting	2
ACCT1225	QuickBooks	3
BUSM1217	Business Communications.....	3
BUSM1290	Job Seeking/Keeping Skills	1

General Education

ENGL1100	Writing for the Workplace	3
GBEH1100	Human Relations	3

Estimated cost of books, supplies and materials: 1,166

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Architectural Construction Technology

Architectural Construction Technology AAS Degree (61 Credits)



Program Description

This program is designed to prepare students for employment in the residential and light commercial construction industry. The objective of the program is to give students a well-rounded, basic construction background, along with CAD (computer aided drafting) skills. Construction technology, materials, design, blueprint reading and estimating are studied in addition to drafting techniques.

Program specific requirements: A laptop computer; the format of the program allows students to work on drafting and design projects in a lab setting as well as off-site.

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons: national or international program certification, national or international standards including skill standards, standards recommended by a primary employer or multiple employers, national specialized program accreditation, state licensure requirements, and/or national practices or standards.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Employment areas for graduates include general contractors, architectural and engineering firms, building material centers, related material suppliers, and building material manufacturers. Graduates work as drafters, estimators, technical support staff, material salespeople, management trainees, and project managers. Articulation agreements with other schools also give students the opportunity to continue their education for advanced degrees in areas such as construction management.

Suggested Technical Studies Semester I

ARCH1503	Introduction to Architectural Drafting	2
ARCH1506	Intro to Architectural CAD	3
ARCH1522	Residential Design Principles	2
CNST1502	Building Materials and Methods	3

Suggested Technical Studies Semester II

ARCH1510	CAD and Design Studio	6
ARCH1534	Residential Design and Presentation	2
CNST1506	Estimating for the Construction Trades I.....	3

Suggested Technical Studies Semester III

ARCH2506	Architectural Design Studio I.....	3
ARCH2510	Architectural CAD II	3
ARCH2522	Commercial Design Principles and Practice.....	2
ARCH2530	Sustainable Building Systems.....	2
CNST2502	Estimating for the Construction Trades II	3

Suggested Technical Studies Semester IV

ARCH2518	Architectural CAD III.....	3
ARCH2542	Structural Building Systems	3
ARCH2551	Professional Constructor Seminar	1
CNST2506	Construction Management.....	3
CNST2510	Commercial Estimating and Project Analysis	2

General Education

MNTC Goal Area 1 Communications-Oral	3
MNTC Goal Area 1 Communications-Written	3
MNTC Goal Area Goal 4 Math/Logic	3
MNTC Goal Area 5 Social Sciences	3
MNTransfer General Education Electives	3

Estimated cost of books, supplies and materials: 2,604

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Architectural Construction Technology

Architectural Construction Technology Diploma (52 Credits)



Program Description

This program is designed to prepare students for employment in the residential and light commercial construction industry. The objective of the program is to give students a well-rounded, basic construction background, along with CAD (computer aided drafting) skills. Construction technology, materials, design, blueprint reading and estimating are studied in addition to drafting techniques.

Program specific requirements: A laptop computer; the format of the program allows students to work on drafting and design projects in a lab setting as well as off-site.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Employment areas for graduates include general contractors, architectural and engineering firms, building material centers, related material suppliers, and building material manufacturers. Graduates work as drafters, estimators, technical support staff, material salespeople, management trainees, and project managers. Articulation agreements with other schools also give students the opportunity to continue their education for advanced degrees in areas such as construction

Suggested Technical Studies Semester I

ARCH1503	Introduction to Architectural Drafting	2
ARCH1506	Intro to Architectural CAD	3
ARCH1522	Residential Design Principles	2
CNST1502	Building Materials and Methods	3

Suggested Technical Studies Semester II

ARCH1510	CAD and Design Studio	6
ARCH1534	Residential Design and Presentation	2
CNST1506	Estimating for the Construction Trades I.....	3

Suggested Technical Studies Semester III

ARCH2506	Architectural Design Studio I.....	3
ARCH2510	Architectural CAD II	3
ARCH2522	Commercial Design Principles and Practice.....	2
ARCH2530	Sustainable Building Systems.....	2
CNST2502	Estimating for the Construction Trades II	3

Suggested Technical Studies Semester IV

ARCH2518	Architectural CAD III.....	3
ARCH2542	Structural Building Systems	3
ARCH2551	Professional Constructor Seminar	1
CNST2506	Construction Management.....	3
CNST2510	Commercial Estimating and Project Analysis	2

General Studies

ENGL1100	Writing for the Workplace	3
GBEH1100	Human Relations	3

Estimated cost of books, supplies and materials: 2,604

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Auto Body Collision Technology

Auto Body Collision Technician AAS Degree (67 Credits)



Program Description

The Auto Body Collision Repair program is designed to meet the needs of today's high-tech and fast-paced automotive industry. The core of the program relies on fundamental repair skills, such as metal straightening, body filler application and sanding of different substrates. Students gain experience on both mild and high strength steel welding using MIG welding standards set by the industry. Students use computers to write estimates, diagnose frame and unibody damage and mix paint.

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons: national or international program certification, national or international standards including skill standards, standards recommended by a primary employer or multiple employers, national specialized program accreditation, state licensure requirements, and/or national practices or standards.

Accreditation information: The Auto Body Collision Technology program is accredited by the National Automotive Technicians Education Foundation, Inc. (NATEF), 101 Blue Seal Drive, Suite 101, Leesburg, VA 20175, (703) 669-6650, www.natef.org.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

The Auto Body Collision Technology Program will give graduates sufficient skills to enter the trade as advanced apprentices. Employment opportunities exist with automotive dealers, independent body repair shops, leasing agencies, truck repair shops, and also paint salespersons. There are also opportunities for employment with an AAS degree as insurance company and body shop estimators, shop managers, and factory dealer representatives.

Suggested Technical Studies Semester I

ABCT1545	Collision Repair Industry.....	3
ABCT1550	Repair Plan Process	2
ABCT1555	Collision Welding	2
ABCT1560	Sheet Metal Repair	4
ABCT1565	Production Lab I.....	4

Estimated cost of books, supplies and materials: 5,060

Suggested Technical Studies Semester II

ABCT1570	Basic Refinish.....	4
ABCT1575	Emerging Technology and Industry Preparation	2
ABCT1580	Non Steel Substrate Repair.....	4
ABCT1585	Production Lab II.....	4

Suggested Technical Studies Semester III

ABCT2545	Advanced Refinish.....	4
ABCT2550	Auto Body Mechanics	4
ABCT2555	Production Lab III.....	5

Suggested Technical Studies Semester IV

ABCT2560	Structural Repair and Analysis	4
ABCT2570	Production Lab IV	6

General Education

MnTC Goal 1 - Communications	6
MnTC Goal 2 - Critical Thinking	3
MnTC Goals 3 through 10	6

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Auto Body Collision Technology

Auto Body Collision Technician Diploma (52 Credits)



Program Description

The Auto Body Collision Repair program is designed to meet the needs of today's high-tech and fast-paced automotive industry. The core of the program relies on fundamental repair skills, such as metal straightening, body filler application and sanding of different substrates. Students gain experience on both mild and high strength steel welding using MIG welding standards set by the industry. Students use computers to write estimates, diagnose frame and unibody damage and mix paint.

Accreditation information: The Auto Body Collision Technology program is accredited by the National Automotive Technicians Education Foundation, Inc. (NATEF), 101 Blue Seal Drive, Suite 101, Leesburg, VA 20175, (703) 669-6650, www.natef.org.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

The Auto Body Collision Technology program will give graduates sufficient skills to enter the trade as advanced apprentices. Employment opportunities exist with automotive dealers, independent body repair shops, leasing agencies, truck repair shops, and also paint salespersons.

Suggested Technical Studies Semester I

ABCT1545	Collision Repair Industry.....	3
ABCT1550	Repair Plan Process	2
ABCT1555	Collision Welding	2
ABCT1560	Sheet Metal Repair	4
ABCT1565	Production Lab I.....	4

Suggested Technical Studies Semester II

ABCT1570	Basic Refinish.....	4
ABCT1575	Emerging Technology and Industry Preparation	2
ABCT1580	Non Steel Substrate Repair.....	4
ABCT1585	Production Lab II.....	4

Suggested Technical Studies Semester III

ABCT2545	Advanced Refinish.....	4
ABCT2550	Auto Body Mechanics	4
ABCT2555	Production Lab III.....	5

Suggested Technical Studies Semester IV

ABCT2560	Structural Repair and Analysis	4
ABCT2570	Production Lab IV	6

Estimated cost of books, supplies and materials: 4,640

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Automotive Service Technician

Automotive Service Technician AAS Degree (72 Credits)



Program Description

The Automotive Service Technician AAS Degree prepares students for entry-level positions in the automotive repair industry. Graduates will be proficient in using the latest equipment for wheel alignment, engine performance (including factory and generic scan tools), electrical and electronic diagnosis, brakes, air conditioning, engine service and drivetrain repair.

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons: national or international program certification, national or international standards including skill standards, standards recommended by a primary employer or multiple employers, national specialized program accreditation, state licensure requirements, and/or national practices or standards.

Accreditation information: The Automotive Service Technician program is accredited by the National Automotive Technicians Education Foundation, Inc. (NATEF), 101 Blue Seal Drive, Suite 101, Leesburg, VA 20175, (703) 669-6650, www.natef.org.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Employment opportunities include service technicians, service advisors and shop managers.

Suggested Technical Studies Semester I

AUTO1508	Automotive Wheel Alignment	4
AUTO1510	Chassis Electrical.....	4
TRAN1502	General Service.....	2
TRAN1504	Electricity and Electronic Principles	3
TRAN1516	Scan Tool Data Acquisition	1
TRAN1518	Transportation Hazardous Materials.....	1

Suggested Technical Studies Semester II

AUTO1512	Engine Repair Theory.....	2
AUTO1516	Brakes	4
AUTO1523	Advanced Chassis Electrical.....	2

Suggested Technical Studies Semester III

AUTO2502	Engine Ignition and Emission Systems	4
AUTO2505	Engine Fuel and Emission Systems.....	5
AUTO2506	Principles of Torque Transfer	7
TRAN1520	Workplace Perceptions and Expectations	2

Suggested Technical Studies Semester IV

AUTO2511	Automatic Transmission and Transaxle Overhaul....	3
AUTO2520	Engine Driveability.....	3
AUTO2523	Advanced Electronic Systems	2
TRAN2514	Basic Air Conditioning	2

Technical Electives *Choose 6 Credits*

AUTO1514	Engine Repair Lab	4
AUTO2512	Driveline Repair II.....	3
AUTO2516	Advanced Air Conditioning.....	2
AUTO2538	Supervised Internship (1-4 credits).....	1
AUTO2540	Light Duty Diesel	2

General Education

MNTC Goal 1 - Communications	6
MNTC Goal 2 - Critical Thinking	3
MNTC Goals 3 through 10	6

Estimated cost of books, supplies and materials: 4,275

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Automotive Service Technician

Automotive Service Technician Diploma (67 Credits)



Program Description

The Automotive Service Technician diploma prepares students for entry-level positions in the automotive repair industry. Graduates will be proficient in using the latest equipment for wheel alignment, engine performance (including factory and generic scan tools), electrical and electronic diagnosis, brakes, air conditioning, engine service and drivetrain repair.

Program accreditation information: The Automotive Service Technician program is accredited by the National Automotive Technicians Education Foundation, Inc. (NATEF), 101 Blue Seal Drive, Suite 101, Leesburg, VA 20175, (703) 669-6650, www.natef.org.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Employment opportunities include service technicians, service advisors and shop managers.

Suggested Technical Studies Semester I

AUTO1508	Automotive Wheel Alignment	4
AUTO1510	Chassis Electrical	4
TRAN1502	General Service.....	2
TRAN1504	Electricity and Electronic Principles	3
TRAN1516	Scan Tool Data Acquisition	1
TRAN1518	Transportation Hazardous Materials.....	1

Suggested Technical Studies Semester II

AUTO1512	Engine Repair Theory	2
AUTO1514	Engine Repair Lab	4
AUTO1516	Brakes	4
AUTO1523	Advanced Chassis Electrical.....	2

Suggested Technical Studies Semester III

AUTO2502	Engine Ignition and Emission Systems	4
AUTO2505	Engine Fuel and Emission Systems.....	5
AUTO2506	Principles of Torque Transfer	7
TRAN1520	Workplace Perceptions and Expectations	2

Suggested Technical Studies Semester IV

AUTO2511	Automatic Transmission and Transaxle Overhaul....	3
AUTO2512	Driveline Repair.....	3
AUTO2516	Advanced Air Conditioning	2
AUTO2520	Engine Driveability.....	3
AUTO2523	Advanced Electronic Systems	2
TRAN2514	Basic Air Conditioning	2

General Education

General Studies Electives	7
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Estimated cost of books, supplies and materials: 4,015

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Biomedical Equipment Technology

Biomedical Equipment Technician AAS Degree (60 Credits)



Program Description

The Biomedical Equipment Technician (BMET) AAS Degree trains and prepares students in troubleshooting, calibration and repair of biomedical instruments, equipment and support systems. The BMET program offers courses that expose students to a variety of instruments and equipment located in hospitals and clinics across the nation. The biomedical field is a fast growing field with demand for qualified technicians.

Program specific requirements: A background check, including fingerprinting, will be completed as a requirement of this program. At the time of the background check submission, students must provide documentation as required by the MN Department of Human Services. If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study, or on your ability to obtain federal, state, and other higher education financial aid. Students who have earned a grade of "C" or better, in all required classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the AAS degree.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Biomedical equipment technicians may be employed by hospitals, clinics, private sector and the military.

Suggested Technical Studies Semester I

ETEC1511	DC Electronics.....	3
ETEC1512	AC Electronics.....	3
ETEC1515	Industrial Safety.....	2
HLTH1440	Medical Terminology.....	1

Suggested Technical Studies Semester II

ETEC1507	Digital Electronics.....	3
ETEC1535	Networking Systems.....	2

Suggested Technical Studies Semester III

BMET2405	Administrative Functions.....	4
BMET2425	Biomedical Technology.....	5
BUSM1290	Job Seeking/Keeping Skills.....	1
MSNA1230	Introduction to Networks I.....	2
MSNA1240	Hardware Support.....	3

Suggested Technical Studies Semester IV

BMET2430	Medical Equipment Networking.....	2
BMET2435	Biomedical Instrumentation.....	5
BMET2440	Biomedical Equipment Technician Internship.....	3
MSNA1245	Software Support.....	2
MSNA1255	Introduction to Networks II.....	2

General Education

BLGY1321	Human Biology.....	4
MATH1300	College Algebra.....	3
Physics - Four credits with lab.....		4
MNTC Goal Area 1 Communications - Oral.....		3
MNTC Goal Area 1 Communications - Written.....		3

Estimated cost of books, supplies and materials: 2,450

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Business Management

Business Management AS Degree (60 Credits)



Program Description

This degree builds a strong foundation in general business topics and gives students the ability to choose to concentrate in accounting, finance and credit, or sales management, marketing. Each elective area focuses students' practical knowledge in their field of study and provides opportunities to apply these skills in a variety of settings.

The Business Management AS Degree at SCTCC is a flexible degree designed for students who want to continue their education and/or enter the workforce. Emphasis is placed on developing skills in decision-making, interpersonal communication, critical thinking, project management and problem solving.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Graduates entering the work environment are likely to be employed by a variety of public and private organizations within the areas of professional sales, customer service, management, purchasing, banking, recovery, financial services, and accounting within retail, wholesale, and service organizations.

Core Studies

ACCT1215	Accounting Principles I	4
ACCT2229	Managerial Accounting.....	4
BUSM2275	Legal Environment of Business.....	3
CPTR1210	Introduction to Computers.....	3
SAMG1215	Principles of Management	3

Technical Electives - Choose 12 Credits

Accounting Electives

ACCT1216	Accounting Principles II.....	4
ACCT1217	Cost Accounting.....	4
ACCT1219	Spreadsheets-Microsoft Excel	2
ACCT1220	Payroll Accounting	2
ACCT1225	QuickBooks	3
ACCT2225	Computerized Accounting Projects	2
ACCT2226	Intermediate Accounting I.....	4
ACCT2230	Income Tax I.....	4
ACCT2231	Income Tax II.....	2

Sales and Management Electives

SAMG1200	Principles of Marketing	3
SAMG1206	Strategic Customer Service.....	3
SAMG1211	Professional Sales Fundamentals.....	3
SAMG1221	Branding and Promotion.....	3
SAMG2245	Marketing Strategies.....	3
SAMG2255	Professional Sales Strategies	3
SAMG2270	Managing Human Resources.....	3
SAMG2280	Sales Force Management.....	3

SAMG2285	Entrepreneurship.....	3
ADVR2275	Social Media Marketing	4
Finance and Credit Electives		
FNCR1200	Personal Money Management	3
FNCR1220	Principles of Banking	3
FNCR1250	Credit Law	3
FNCR1260	Risk Management and Commercial Real Estate	3
FNCR2245	Consumer Lending.....	3

General Education

ENGL1302	Analytical Writing	4
ECON2320	Intro to Macroeconomics	3
ECON2330	Intro to Microeconomics	3
MNTC Goal Area 1	Communications Oral	3
MNTC Goal Area 4	Math 1300 or 1350.....	3
MNTC Goal Area 6	Humanities	3
MNTC Goal Area 7	Diversity.....	3
MNTC Goal Area 8	Global Perspectives.....	3
MNTC Goal Area 9	Ethic/Civic Responsibility	3
MNTransfer	General Education Electives Any Goal Area	3

Estimated cost of books, supplies and materials: 1,795

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Cardiovascular Technology

Cardiovascular Technology AAS Degree (60 Credits)



Program Description

The demands of the Cardiovascular Technologist require a working knowledge of detailed anatomy, physiology and pathology of the heart, coronary arteries, and cardiac vascular function. Cardiovascular students acquire the skills to assist cardiologists in performing diagnostic, interventional, angioplasty and stent placement procedures; measure cardiovascular parameters such as cardiac output, and intra-cardiac pressure measurements.

Degree Specific Program Requirements: A background check, including fingerprinting, will be completed as a requirement of this program. At the time of the background check submission, students must provide documentation as required by the MN Department of Human Services. If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study, or on your ability to obtain federal, state, and other higher education financial aid. Students who have earned a grade of "C" or better, in all required classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the AAS degree.

Accreditation Information: The Cardiovascular Technology program is accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP), 1361 Park Street, Clearwater, FL 33756. Telephone:(727) 210-2350 Fax: (727) 210-2350, web site: <http://www.caahep.org/> and Joint Review Committee on Education in Cardiovascular Technology (JRC-CVT), 1449 Hill Street, Whitinsville, MA 01588-1032. Telephone: (978) 456-5594 <http://www.jrcvct.org/> .

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

The Cardiovascular Technology Program prepares students for employment in cardiac catheterization labs, electrophysiology labs, open heart surgical suites and cardiac research facilities.

Acceptance Requirements

HLTH1440	Medical Terminology.....	1
BLGY2310	Human Anatomy/Physiology I	4
MNTC Goal Area 1	Communications (Oral)	3

***Current CPR, AHA Healthcare Provider, required**

***Applicants must complete Anatomy & Physiology I by the end of spring term prior to starting the program. Preference will be given to students who have completed all acceptance and general education requirements.**

***Applicants must be vaccinated against Hepatitis B or sign a release form. HBV series must be completed prior to students starting the Spring semester of the 2nd year.**

***NOTE: MOST CLINICAL SITES ARE LOCATED IN THE FIVE STATE AREA. ADDITIONAL SITES IN OTHER STATES MAY ALSO BE AVAILABLE.**

Suggested Technical Studies Semester I

ICVT1441	Introduction to Clinics	3
ICVT1445	Cardiovascular Anatomy and Physiology.....	3

Suggested Technical Studies Semester II

ICVT1422	Cardiovascular Instrumentation.....	3
ICVT1424	Catheterization Lab Fundamentals I.....	3

ICVT1430	EKG Interpretation	1
ICVT1443	Cardiovascular Clinic I.....	5

Suggested Technical Studies Semester III

ICVT2405	Cardiovascular Pathology	3
ICVT2427	Catheterization Lab Fundamentals II.....	3
ICVT2446	Cardiovascular Clinical II.....	5

Suggested Technical Studies Semester IV

ICVT2450	Applied Clinical Internship.....	13
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General Education

MNTC Goal Area 1	Communications-ENGL 1302 or 1303	3
MNTC Goal Area 4	Mathematics (1300 or 1351 or 1350).....	3
BLGY2320	Human Anatomy/Physiology II.....	4

Estimated cost of books, supplies and materials: 3,950

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Carpentry

Carpentry Diploma (33 Credits)



Program Description

The Carpentry Program is designed to prepared students to enter the construction industry as skilled tradespeople. The building construction industry is one of the largest industries in America today. With the increasing population and need for more housing, urban redevelopment, commercial and industrial buildings and facilities to improve the environment, the skills of a well-trained carpenter are in demand.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

The Carpentry Program is designed to equip students to enter the trade as the equivalent to advanced apprentices. Graduates may find employment in the areas of residential, light and heavy commercial, highway and heavy bridgework, cabinetry and millwork.

Suggested Technical Studies Semester I

CARP1507	Construction Tools, Equipment and Machines	2
CARP1521	Construction Principles.....	4
CARP1540	Blueprint Reading.....	2
CARP1555	Residential Construction Lab	3
CNST1502	Building Materials and Methods	3

Suggested Technical Studies Semester II

CARP1524	Rafters and Stairs.....	4
CARP1538	Cabinet Building and Estimating.....	4
CARP1545	Interior Finish	3
CARP1550	Exterior Finish	2
CNST1506	Estimating for the Construction Trades I.....	3

General Studies

General Studies - Human Relations	3
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Estimated cost of books, supplies and materials: 1730

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Center for Manufacturing and Applied Engineering

Production Technologies Certificate (16 Credits)



Program Description

This certificate will provide courses designed to be an introduction to production technologies and provide initial information to start students on a career pathway. Students will engage in topics of technical mathematics, introductory computer skills, print interpretation, manufacturing processes, quality control, maintenance, and safety.

The nationwide Manufacturing Skills Standards Council (MSSC) System, based upon industry-defined and federally-endorsed national standards, offers both entry-level and incumbent workers the opportunity to demonstrate that they have acquired the skills increasingly needed in the high-growth, technology-intensive jobs of the 21st century. The MSSC System awards certificates to individuals who pass any of its four Production modules: Safety; Quality Practices & Measurement; Manufacturing Processes & Production; and Maintenance Awareness and a full Certified Production Technician (CPT) Certification to those who pass all four. Students completing the Production Technologies Certificate will have gained the knowledge required to pass the MSSC full certified Production Technician.

Technical Studies

CMAE1502 Technical Math	3
CMAE1506 Introduction to Computers	2
CMAE1510 Print Reading	2
CMAE1514 Safety	2
CMAE1518 Manufacturing Processes	2
CMAE1522 Quality	2
CMAE1526 Maintenance Awareness	2
CMAE1528 Career Success Skills.....	1

Estimated cost of books, supplies and materials: \$450

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Center for Manufacturing and Applied Engineering

Automation Technologist Certificate (30 Credits)



Program Description

This certificate will provide courses designed to be an introduction to production technologies and automation technologies to start students on a career pathway. Students will engage in topics of technical mathematics, introductory computer skills, print interpretation, manufacturing processes, quality control, maintenance, safety, AC/DC power, digital electronics, analog circuits, and motor controls.

The nationwide Manufacturing Skills Standards Council (MSSC) System, based upon industry-defined and federally-endorsed national standards, offers both entry-level and incumbent workers the opportunity to demonstrate that they have acquired the skills increasingly needed in the high-growth, technology-intensive jobs of the 21st century. The MSSC System awards certificates to individuals who pass any of its four Production modules: Safety; Quality Practices & Measurement; Manufacturing Processes & Production; and Maintenance Awareness and a full Certified Production Technician (CPT) Certification to those who pass all four. Students completing the Production Technologies Certificate will have gained the knowledge required to pass the MSSC full certified Production Technician Certification.

Technical Studies Semester I

CMAE1502 Technical Math	3
CMAE1506 Introduction to Computers	2
CMAE1510 Print Reading	2
CMAE1514 Safety	2
CMAE1518 Manufacturing Processes	2
CMAE1522 Quality	2
CMAE1526 Maintenance Awareness	2

Technical Studies Semester II

CMAE1550 DC Power	3
CMAE1552 AC Power	3
CMAE1554 Digital Electronics	3
CMAE1556 Analog Circuits	3
CMAE1558 Motor Controls	3

Estimated cost of books, supplies and materials: \$1050

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Center for Manufacturing and Applied Engineering

Welding Technology Certificate (30 Credits)



Program Description

This certificate will provide courses designed to be an introduction to production technologies and welding fundamentals to start students on a career pathway. Students will engage in topics of technical mathematics, introductory computer skills, print interpretation, manufacturing processes, quality control, maintenance, safety, welding print reading and interpreting symbols, following welding procedures, safety, metallurgy and mechanical properties of materials, and hands on experience with specific welding processes including oxyacetylene cutting and welding, shielded metal arc welding, gas metal arc welding, flux core arc welding, and gas tungsten arc welding.

The nationwide Manufacturing Skills Standards Council (MSSC) System, based upon industry-defined and federally-endorsed national standards, offers both entry-level and incumbent workers the opportunity to demonstrate that they have acquired the skills increasingly needed in the high-growth, technology-intensive jobs of the 21st century. The MSSC System awards certificates to individuals who pass any of its four Production modules: Safety; Quality Practices & Measurement; Manufacturing Processes & Production; and Maintenance Awareness and a full Certified Production Technician (CPT) Certification to those who pass all four. Students completing the Production Technologies Certificate will have gained the knowledge required to pass the MSSC full certified Production Technician Certification.

Technical Studies Semester I

CMAE1502 Technical Math	3
CMAE1506 Introduction to Computers	2
CMAE1510 Print Reading	2
CMAE1514 Safety	2
CMAE1518 Manufacturing Processes	2
CMAE1522 Quality	2
CMAE1526 Maintenance Awareness	2

Technical Studies Semester II

CMAE1560 Interpreting Symbols	2
CMAE1562 Oxy Fuel	3
CMAE1564 SMAW	3
CMAE1566 GMAW/FCAW	3
CMAE1568 GTAW	3
CMAE1570 Metallurgy	1

Estimated cost of books, supplies and materials: \$1050

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Child, Adult Care and Education/Paraprofessional

Child, Adult Care And Education/Paraprofessional
AAS Degree (60 Credits)



Program Description

The Child, Adult Care and Education (CACE) AAS Degree covers human development, behavior management, learning environments, planning curriculums, implementing strategies for learning, and practical experience. In addition, site visits, service learning and two internships help students gain real-world experience in multiple areas of child and adult care, choosing from early childhood studies, special education, infant care, school involvement, and senior centers.

Degree Specific Program Requirements: Before being placed in an Internship, students will be required to complete and submit a MN Department of Human Service (DHS) Background Study form. If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study, or on your ability to obtain federal, state, and other higher education financial aid. Students who have earned a grade of “C” or better, in all technical classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the AAS degree.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Graduates enjoy a consistently high placement rate in their new careers. Career opportunities for Child and Adult Care and Education graduates may be found in early childhood centers, school settings, long-term care facilities, licensed family child care, facilities for people with disabilities, as well as those who are interested in starting their own business as child care providers.

Technical Studies Pre-requisites:

*Note: First Aid & CPR for Child Care or equivalent required: Current CPR, Sudden Unexplained Infant Death and Shaken Baby Certification must be maintained throughout the program. This is a pre-requisite for CACE 1460.

Suggested Technical Studies Semester I

CACE1400	Professional Relations in CACE Careers	3
CACE1420	Foundations of Development.....	3
CACE1440	Guidance: Managing the Physical and Social Environment.....	3
CACE1444	Planning & Implementing Curriculum	3
CACE1460	Internship I.....	3

Suggested Technical Studies Semester II

CACE1404	Safety, Health and Nutrition	3
CACE1422	Profiles of the Exceptional Child.....	3
CACE1424	School-Age Strategies for Learning	3
CACE1464	Internship II	3

Suggested Technical Studies Semester III

CACE1426	Children with Difficult Behaviors.....	3
CACE1470	Professional and Leadership Development	1

Suggested Technical Studies Semester IV

CACE1428	Family & Community Relations.....	3
CACE1448	Literature & Language Development Experiences... ..	3

Technical Electives*Choose 7 credits*

CACE1455	Aging: Activities and Adaptations	3
CACE1473	Strategies in Reading for the Paraprofessional	2
CACE1474	Strategies in Math for Paraprofessional.....	2
CACE1476	Writing Strategies for Paraprofessionals	1
CACE1478	Technology Strategies for Paraprofessionals.....	1
CACE1479	Autism Spectrum Disorder (ASD).....	1
CACE1480	Caring for Children with Special Health Needs	2

General Education

ENGL1302	Analytical Writing	4
MNTC Goal Area 1 Oral Communications		
CMST2300 Recommended		3
MNTC Goal Area 3 Natural Sci. or Goal 4 Math/Logic		3
MNTC Goal Area 5 Historical/Social and Behavior Science		3
MNTC Goal Area 7 Diversity		3

Estimated cost of books, supplies and materials: 1,411

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Child, Adult Care and Education/Paraprofessional

Child & Adult Care And Education AS Degree (60 Credits)



Program Description

The Child, Adult Care and Education (CACE) AS Degree covers human development, behavior management, learning environments, planning curriculums, implementing strategies for learning, and practical experience. In addition, site visits, service learning and two internships help students gain real-world experience in multiple areas of child and adult care, choosing from early childhood studies, special education, infant care, school involvement, and senior centers. The AS degree is designed to allow students to continue their education at partnering Universities.

Degree Specific Program Requirements: Before being placed in an Internship, students will be required to complete and submit a MN Department of Human Service (DHS) Background Study form. If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study, or on your ability to obtain federal, state, and other higher education financial aid. Students who have earned a grade of "C" or better, in all technical classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the AS degree.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Graduates enjoy a consistently high placement rate in their new careers. Career opportunities for Child and Adult Care and Education graduates may be found in early childhood centers, school settings, long-term care facilities, licensed family child care, facilities for people with disabilities, as well as those who are interested in starting their own business as child care providers.

Technical Studies Pre-requisites:

*Note: First Aid & CPR for Child Care or equivalent required: Current CPR, Sudden Unexplained Infant Death and Shaken Baby certification must be maintained throughout the program. This is a pre-requisite for CACE 1460.

Suggested Technical Studies Semester I

CACE1400 Professional Relations in CACE Careers	3
CACE1420 Foundations of Development.....	3
CACE1440 Guidance: Managing the Physical and Social Environment.....	3
CACE1444 Planning & Implementing Curriculum	3
CACE1460 Internship I.....	3

Suggested Technical Studies Semester II

CACE1404 Safety, Health and Nutrition	3
CACE1422 Profiles of the Exceptional Child.....	3
CACE1424 School-Age Strategies for Learning	3
CACE1464 Internship II	3
CACE1470 Professional and Leadership Development	1

General Education

ENGL1302 Analytical Writing	4
SOCI1350 Sociology of Marriage and Family	3
MNTC Goal Area 1 Oral Communications	
CMST2300 Recommended	3

MNTC Goal Area 2 Critical Thinking	3
MNTC Goal Area 3 Natural Science - Biology with lab	4
MNTC Goal Area 4 - Math College Algebra recommended	3
MNTC Goal Area 5 History/Social and Behavioral Sciences	3
MNTC Goal Area 7 Diversity	3
MNTC Goal Area 8 Global Perspective	3
MNTC Goal Area 9 Ethic and Civic Responsibility	3

Estimated cost of books, supplies and materials: 1,411

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Child, Adult Care and Education/Paraprofessional

Child & Adult Care And Education Diploma (34 Credits)



Program Description

Learning to care for and working with children, youth, families, and/or the elderly is important to students of the Child, Adult Care and Education (CACE) diploma program. In a non-lecture-based format, students enjoy an interactive, hands-on experience and gain valuable information, insight, and networking opportunities with guest speakers, discussions, and many other activities.

The Child, Adult Care and Education diploma covers human development, behavior management, learning environments, planning curriculums, implementing strategies for learning, and practical experience. In addition, site visits, service learning and two internships help students gain real-world experience in multiple areas of child and adult care, choosing from early childhood studies, special education, infant care, school involvement, and senior centers.

Degree Specific Program Requirements: Before being placed in an Internship, students will be required to complete and submit a MN Department of Human Service (DHS) Background Study form. If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study, or on your ability to obtain federal, state, and other higher education financial aid. Students who have earned a grade of "C" or better, in all technical classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the diploma.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).
The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Graduates enjoy a consistently high placement rate in their new careers. Career opportunities for Child and Adult Care and Education graduates may be found in early childhood centers, school settings, long-term care facilities, licensed family child care, facilities for people with disabilities, as well as those who are interested in starting their own business as child care providers.

Technical Studies Pre-requisites:

*Note: First Aid & CPR for Child Care or equivalent required: Current CPR, Sudden Unexpected Infant Death and Shaken Baby certification must be maintained throughout the program. This is a pre-requisite to CACE 1460.

Suggested Technical Studies Semester I

CACE1400	Professional Relations in CACE Careers	3
CACE1420	Foundations of Development.....	3
CACE1440	Guidance: Managing the Physical and Social Environment.....	3
CACE1444	Planning & Implementing Curriculum	3
CACE1460	Internship I.....	3

Suggested Technical Studies Semester II

CACE1404	Safety, Health and Nutrition	3
CACE1422	Profiles of the Exceptional Child.....	3
CACE1424	School-Age Strategies for Learning	3
CACE1464	Internship II	3
CACE1470	Professional and Leadership Development	1

General Education

DVRS1304	Diversity and Social Justice.....	3
ENGL1100	Writing for the Workplace	3

Estimated cost of books, supplies and materials: 1,411

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

CNC and Advanced Machining

CNC and Advanced Machining AAS Degree (60 Credits)



Program Description

CNC and ADVANCED MACHINING (60 credits required)

ADVANCED CNC/CAM MACHINIST CONCENTRATION (68 credits required)

CNC MOLDBAKER/CAM MACHINIST CONCENTRATION (68 credits required)

The CNC and Advanced Machining program develops students' skills to convert various materials into intricate, precise and usable parts. Student will learn to work from blueprints and written specifications to select the proper machinery, materials, and tools, and gain proficiency with machine tools such as lathes, mills, grinders, drill-presses, computers, and computerized numerical control (CNC) machines.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

The program is designed to give students the necessary skills to enter the labor market as a machine operator, machinist, or a tool and die or mold-maker apprentice. Graduates can expand to areas such as tool making, multi-axis CNC programmer precision machining, setup specialist, CNC applications/sales, machining technician, CNC machining including Swiss CNC turning technology.

Suggested Technical Studies Semester I

MACH1503	Machine Tool Technology I	4
MACH1510	Machine Tool Technology II	4
MACH1517	Blueprint Reading I	1
TECH1550	Basic CADD	2

Suggested Technical Studies Semester II

MACH1511	Machine Tool Technology III	5
MACH1514	Introduction to Swiss Turning	2
MACH1519	Blueprint Reading II	1
MACH1532	CAM I 2D	1
MACH1540	CNC Fundamentals	2
TECH1530	Computer Applications	2
TECH1552	Basic Metal Joining and Fabrication	2

Suggested Technical Studies Semester III

MACH1525	Geometric Dimensioning and Tolerancing	1
MACH2504	CNC Milling/Turning	4
MACH2510	Cutting Tool Technology	1
MACH2514	Metallurgy	1
MACH2523	High Performance Manufacturing	1
MACH2528	Introduction to Electrical Discharge Machining	2

CNC Machinist Concentration

MACH1528	Jigs and Fixtures	1
MACH2542	CNC Milling Setup & Operations with 4th Axis	4
MACH2545	CNC Turning Setup & Operation	4

Advanced CNC/CAM Machinist Concentration

MACH1528	Jigs and Fixtures	1
MACH2512	CAM II 3D/Solid Modeling/Turning	2
MACH2516	CAM III Multi-Axis Programming	2
MACH2519	Advanced CNC Milling	2
MACH2527	Advanced CNC Turning	2
MACH2531	Multiaxis VMC	2

MACH2535	Live Tooling Turning Centers	2
MACH2539	Advanced Electrical Discharge Machining	1
MACH2540	Advanced Swiss CNC Turning	2
MACH2544	CNC/CAM Capstone	1

CNC Moldmaker/CAM Machinist Concentration

MACH2512	CAM II 3D/Solid Modeling/Turning	2
MACH2548	Plastics - Application and Chemistry	1
MACH2550	Mold Design Theory	2
MACH2552	Mold Design Applied	2
MACH2554	Mold Base, Force and Cavity	5
MACH2558	Ejector System, Runners and Gates	4
MACH2562	Mold Press Operation	1

General Education

MATH1300	College Algebra	3
MATH1321	Trigonometry	3
MNTC Goal 1	Communications Written	3
MNTC Goal 1	Communications Oral	3
MNTC Goal 5 or 7	Social Sciences/Diversity	3

Estimated cost of books, supplies and materials: 4,820

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

CNC and Advanced Machining

CNC and Advanced Machining Diploma (55 Credits)



Program Description

CNC AND ADVANCED MACHINING (55 credits required)

ADVANCED CNC/CAM MACHINIST CONCENTRATION (63 credits required)

CNC MOLDMAKER/CAM MACHINIST CONCENTRATION (63 credits required)

The CNC and Advanced Machining program develops students' skills to convert various materials into intricate, precise and usable parts. Student will learn to work from blueprints and written specifications to select the proper machinery, materials, and tools, and gain proficiency with machine tools such as lathes, mills, grinders, drill-presses, computers, and computerized numerical control (CNC) machines.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

The program is designed to give students the necessary skills to enter the labor market as a machine operator, machinist, or a tool and die or mold-maker apprentice. Graduates can expand to areas such as tool making, multi-axis CNC programmer precision machining, setup specialist, CNC applications/sales, machining technician, CNC machining including Swiss CNC turning technology.

Suggested Technical Studies Semester I

MACH1503 Machine Tool Technology I.....	4
MACH1507 Machine Technology III.....	4
MACH1510 Machine Tool Technology II.....	4
MACH1517 Blueprint Reading I.....	1
TECH1550 Basic CADD.....	2

Suggested Technical Studies Semester II

MACH1511 Machine Tool Technology III.....	5
MACH1514 Introduction to Swiss Turning.....	2
MACH1519 Blueprint Reading II.....	1
MACH1532 CAM 1 2D.....	1
MACH1540 CNC Fundamentals.....	2
TECH1530 Computer Applications.....	2
TECH1552 Basic Metal Joining and Fabrication.....	2

Suggested Technical Studies Semester III

MACH1525 Geometric Dimensioning and Tolerancing.....	1
MACH2504 CNC Milling/Turning.....	4
MACH2510 Cutting Tool Technology.....	1
MACH2514 Metallurgy.....	1
MACH2523 High Performance Manufacturing.....	1
MACH2528 Introduction to Electrical Discharge Machining.....	2

CNC Machinist Concentration

MACH1528 Jigs and Fixtures.....	1
MACH2542 CNC Milling Setup & Operations with 4th Axis.....	4
MACH2545 CNC Turning Setup & Operation.....	4

Advanced CNC/CAM Machinist Concentration

MACH1528 Jigs and Fixtures.....	1
MACH2512 CAM II 3D/Solid Modeling/Turning.....	2

MACH2516 CAM III Multi-Axis Programming.....	2
MACH2519 Advanced CNC Milling.....	2
MACH2527 Advanced CNC Turning.....	2
MACH2531 Multiaxis VMC.....	2
MACH2535 Live Tooling Turning Centers.....	2
MACH2539 Advanced Electrical Discharge Machining.....	1
MACH2540 Advanced Swiss CNC Turning.....	2
MACH2544 CNC/CAM Capstone.....	1

CNC Moldmaker/CAM Machinist Concentration

MACH2512 CAM II 3D/Solid Modeling/Turning.....	2
MACH2548 Plastics - Application and Chemistry.....	1
MACH2550 Mold Design Theory.....	2
MACH2552 Mold Design Applied.....	2
MACH2554 Mold Base, Force and Cavity.....	5
MACH2558 Ejector System, Runners and Gates.....	4
MACH2562 Mold Press Operation.....	1

General Studies

ENGL1100 Writing for the Workplace.....	3
GBEH1100 Human Relations.....	3

Estimated cost of books, supplies and materials: 4,520

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

CNC and Advanced Machining

Machine Operator Diploma (33 Credits)



Program Description

The Machine Operator program is designed to give students the necessary skills to enter the labor market as a machine operator, machinist, or a tool and die or mold-maker apprentice. Graduates can expand to areas such as tool making, multi-axis CNC programmer precision machining, setup specialist, CNC applications/sales, machining technician, CNC machining including Swiss CNC turning technology.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

The program is designed to give students the necessary skills to enter the labor market as a machine operator, machinist, or a tool and die or mold-maker apprentice.

Suggested Technical Studies Semester I

MACH1503	Machine Technology I	4
MACH1507	Machining Math.....	4
MACH1510	Machine Technology II.....	4
MACH1517	Blueprint Reading I.....	1
TECH1550	Basic CADD	2

Suggested Technical Studies Semester II

MACH1511	Machine Tool Technology III	5
MACH1519	Blueprint Reading II	1
MACH1540	CNC Fundamentals.....	2
TECH1530	Computer Applications	2
TECH1552	Basic Metal Joining and Fabrication	2

General Studies

ENGL1100	Writing for the Workplace	3
GBEH1100	Human Relations	3

Estimated cost of books, supplies and materials: 2,700

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Computer-Aided Mechanical Design

Computer-Aided Mechanical Design AAS Degree (68 Credits)



Program Description

The Computer-Aided Mechanical Design program consists of a concentration of computer-aided design technology and related math and general education courses. Students learn basic concepts in related fields such as electronics, machine shop, and welding. This program prepares students to create mechanical drawings that meet industry standards. Drawings, whether plotted on paper or in an electronic format are the universal graphic language in the manufacturing industry.

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons; national or international program certification, national or international standards, including skill standards; standards recommended by a primary employer or multiple employers; national specialized program accreditation; state licensure requirements; and/or national practices or standards.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Graduates of both concentrations can expect career opportunities in many areas of the engineering field. Graduates will often assist engineers with product design, tool design or product continuation or improvement. Entry-level positions may include: CAD Drafter/Designer, Engineering Technician, Research and Development Technician, Quality Control or Field Service Technicians and other related areas.

Suggested Technical Studies Semester I

CADD1502	AutoCAD Foundations	3
CADD1512	Inventor Foundations	3
TECH1545	Technical Computations	3
TECH1556	Basic Manual - Automated Machining	2

Suggested Technical Studies Semester II

CADD1507	Mechanical CADD II.....	3
CADD1516	CADD Applications II.....	3
CADD1520	SolidWorks Foundations.....	3
CADD1523	Design Calculations I.....	3
CADD1530	Basic Electric Circuits	1

Suggested Technical Studies Semester III

CADD2505	Advanced Drawing Principles I.....	3
CADD2509	Advanced Drawing Principles II	3
CADD2518	Design Calculations II	3
CADD2529	Manufacturing Systems	2
TECH1552	Basic Metal Joining and Fabrication	2

Suggested Technical Studies Semester IV

CADD2510	Design Concepts	3
CADD2514	Computer- Aided Design	3
CADD2522	Machine Design	3
CADD2532	Geometric Dimensioning for Designers	2
CADD2541	Mastercam Fundamentals	2

CADD2542	Reverse Engineering	2
CADD2550	Mechanical Design Technical Communications.....	1

General Education

MNTC Goal Area 1 Communications	3
MNTC Goal Area 7 Diversity	3
MNTC Transfer Electives From Goal Areas 2 - 6 or 8 - 10	9

Estimated cost of books, supplies and materials: 3,615

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Computer-Aided Mechanical Design

Computer-Aided Mechanical Design Diploma (59 Credits)



Program Description

The Computer-Aided Mechanical Design program consists of a concentration of computer-aided design technology and related math and general studies courses. Student learn basic concepts in related fields such as electronics, machine shop, and welding. This program prepares students to create mechanical drawings that meet industry standards. Drawings, whether plotted on paper or in an electronic format are the universal graphic language in the manufacturing industry.

This program immerses students in the product design process, including manufacturing process selection, material selections, design and stress calculations, applying geometric dimensioning and tolerancing, the FEA (finite element analysis) process, cost of product and safety of products to consumers in regard to product design.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Graduates of both concentrations can expect career opportunities in many areas of the engineering field. Graduates will often assist engineers with product design, tool design or product continuation or improvement. Entry-level positions may include: CAD Drafter/ Designer, Engineering Technician, Research and Development Technician, Quality Control or Field Service Technicians and other related areas.

The concentration areas prepare the graduate for advancement from their entry level position into either the designer position in a company or into either a reverse engineering position or a position in the rapid prototyping department.

Suggested Technical Studies Semester I

CADD1502	AutoCAD Foundations	3
CADD1512	Inventor Foundations	3
TECH1545	Technical Computations	3
TECH1556	Basic Manual - Automated Machining	2

Suggested Technical Studies Semester II

CADD1507	Mechanical CADD II.....	3
CADD1516	CADD Applications II.....	3
CADD1520	SolidWorks Foundations.....	3
CADD1523	Design Calculations I.....	3
CADD1530	Basic Electric Circuits	1

Suggested Technical Studies Semester III

CADD2505	Advanced Drawing Principles I.....	3
CADD2509	Advanced Drawing Principles II	3
CADD2518	Design Calculations II	3
CADD2529	Manufacturing Systems	2
TECH1552	Basic Metal Joining and Fabrication	2

Suggested Technical Studies Semester IV

CADD2510	Design Concepts	3
CADD2514	Computer- Aided Design	3
CADD2522	Machine Design	3
CADD2532	Geometric Dimensioning for Designers	2
CADD2541	Mastercam Fundamentals	2

CADD2542	Reverse Engineering	2
CADD2550	Mechanical Design Technical Communications.....	1

General Studies

ENGL1100	Writing for the Workplace	3
GBEH1100	Human Relations	3

Estimated cost of books, supplies and materials: 3,345

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Computer-Aided Design Manufacturing

*Computer-Aided Design Manufacturing Technology
Advanced Technical Certificate (18 Credits)*



Program Description

This advanced certificate allows students to expand the breadth of computer-aided design (CAD) or computerized numerical control (CNC) and related technologies. The cross-functional nature of the advanced certificate broadens their experience in machining or design applications.

Degree Specific Program Requirements: To enroll in this program, a student must have graduated from either the Machine Tool Technology or Mechanical Design Technology program with at least a 3.0 GPA and instructor approval.

Career Opportunities

Technicians with drafting and design background will often assist engineers and designers with the design and development of new products and tools and the modernizing of present equipment. Graduates will find placement opportunities in both large and small companies. The cross-functional nature of the advanced certificate gives graduates options in both machining and design technology.

Suggested Technical Studies - Machine Tool Grads

CADD1502 Mechanical CADD I.....	3
CADD1507 Mechanical CADD II.....	3
CADD1512 CADD Applications I.....	3
CADD1516 CADD Applications II.....	3
CADD1520 SolidWorks Foundations.....	3
CADD2550 Technical Communications.....	1
CADM3502 CMM Operations.....	2

Suggested Technical Studies - Mechanical Design Grads

CADM3502 CMM Operations.....	2
MACH1540 CNC Fundamentals.....	2
MACH2504 CNC Milling/Turning.....	4
MACH2510 Cutting Tool Technology.....	1
MACH2514 Metallurgy.....	1
MACH2542 CNC Milling Setup and Operations with 4th Axis...	4
MACH2545 CNC Turning Setup and Operation.....	4

Estimated cost of books, supplies and materials: 1,010

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Computer Programming

Computer Programmer AAS Degree (71 Credits)



Program Description

E-commerce and the Internet have become an integral daily life. Students will receive extensive exposure to current methodologies, languages, programming procedures, and business data processing applications. Programming students will design and write programs for e-commerce, business applications, and network and mobile environments. Students will develop skills critical to the field in customizing, programming, debugging and testing computer programs along with learning to follow instructions provided by system documentation, review results and make necessary corrections to achieve desired program output. The program emphasizes development of strong communication, problem solving and decision making skills as well as integrating team-based learning - all skills necessary to prepare students for today's work environment.

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons: national or international program certification, national or international standards including skill standards, standards recommended by a primary employer or multiple employers, national specialized program accreditation, state licensure requirements, and/or national practices or standards.

Degree Specific Program Requirements: All students in the Computer Programmer major are required to purchase a laptop computer for their coursework. Students who have earned a grade of "C" or better, in all technical classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the AAS degree.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

The use of stand-alone and networked computers is rapidly increasing in all levels of government and business. Employment potential is outstanding for competent Computer Programmer graduates.

Suggested Technical Studies Semester I

CMSC1203	Structured Programming Logic	3
CMSC1206	Basic Networking/ Security	3
CMSC1212	Web Markup Language.....	3
CMSC1225	Java Language I.....	3

Suggested Technical Studies Semester II

CMSC1215	XML.....	3
CMSC1216	Database Modeling I.....	3
CMSC1217	Data Analytics.....	3
CMSC1255	PHP.....	3
CMSC2266	Java Language II.....	3

Suggested Technical Studies Semester III

CMSC2201	Database Modeling II	3
CMSC2203	C# Programming.....	3
CMSC2204	Mobile Device Programming/Connectivity.....	3
CMSC2206	Python Programming	3
BUSM1290	Job Seeking/Keeping Skills	1

Suggested Technical Studies Semester IV

CMSC2205	Internship	3
CMSC2220	Cryptography	3
CMSC2240	Advanced C# Programming	3
CMSC2268	Network Programming	3
CMSC2279	Systems Analysis and Design	3

General Education

CMST1320	Intro to Communication Studies	3
ENGL1302	Analytical Writing	4
MATH1300	College Algebra	3
MNTC Goal Area 5	Social Sciences	3
MNTC Goal Area 6	Humanities	3

Estimated cost of books, supplies and materials: 2,850

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Culinary Arts

Culinary Arts AAS Degree (66 Credits)



Program Description

The Culinary Arts AAS Degree offers students extensive hands-on cooking experience while including a broad range of liberal arts and management courses to provide students the skills needed to succeed in the complex food service world. The program embraces a wide range of cuisines and cultures which expose students to a variety of cooking techniques, recipes, and ingredients that satisfy today's consumers. As part of the program students will develop nutrition, kitchen procedures, menu planning, and recipe development in specialized courses that each focus on important aspects of culinary development. Additional courses expose students to the business aspects of culinary arts such as financial planning, human resources, customer relations, and the legal environment. Graduates will have a firm grasp of fundamental culinary and management techniques that support successful culinary operations and are demanded by consumers and industry employers.

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons: national or international program certification, national or international standards including skill standards, standards recommended by a primary employer or multiple employers, national specialized program accreditation, state licensure requirements, and/or national practices or standards.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Students who complete the Culinary Arts program will be prepared for culinary positions including sous chef, head/executive chef, kitchen manager, dining room manager, caterer, and hospitality management. Employment opportunities can be found in hotels, restaurants, clubs, healthcare, schools, resorts, and many other food-related operations.

Suggested Technical Studies Semester I

CULN1202	Introduction to Culinary Arts.....	3
CULN1205	Kitchen Operations	3
CULN1210	Servsafe Certification.....	1
CULN1215	Stocks, Soups, Sauces.....	3
CULN1220	Introduction to Pantry Food Preparation	2
CULN1230	Vegetables, Potato, Rice and Farinaceous Products .	2
CULN1235	Introduction to Breakfast	2

Suggested Technical Studies Semester II

CULN1245	Basic Baking	3
CULN1250	Basic Cooking Principles.....	4
CULN1265	Basic Food Production Principles.....	3
CULN1270	Garde Manger	4
CULN1275	Social Etiquette.....	2

Suggested Technical Studies Semester III (May Term)

CULN1280	Foodservice Internship.....	2
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Suggested Technical Studies Semester IV

ACCT1215	Accounting Principles I	4
BUSM2275	Legal Environment of Business.....	3
SAMG1215	Principles of Management	3

Suggested Technical Studies Semester V

BUSM1212	Customer Relationship Management OR	
SAMG1206	Strategic Customer Service.....	3
BUSM1290	Job Seeking/Keeping Skills	1
CPTR1210	Introduction to Computers.....	3

General Education

MNTC Goal Area 1 - Written Technical Writing Recommended ..	3	
MNTC Goal Area 1 - Oral Interpersonal Communications	3	
CRTK1300	Critical Thinking	3
DVRS1304	Diversity and Social Justice	3
ECON1310	Personal Finance	3

Estimated cost of books, supplies and materials: 1,603

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Culinary Arts

Culinary Arts Diploma (38 Credits)



Program Description

The Culinary Arts Program is designed to prepare students for the food service industry by exploring all facets of food preparation, planning, and service. The program provides training in nutrition, sanitation, and the operation of equipment in addition to food preparation techniques. Technical classes are supplemented with a variety of assessments, demonstrations, training, preparation and service experiences. Students will have many opportunities to participate in college and community events that provide practical experience in the field, including membership in the local Chef's Society.

The general studies courses are technically focused and not designed for transfer

Career Opportunities

As a graduate of the program, students will be licensed in ServSafe and may enjoy a career as a chef or cook in hotels, restaurants, resorts, catering, healthcare centers, and more!

Suggested Technical Studies Semester I

CULN1202	Introduction to Culinary Arts.....	3
CULN1205	Kitchen Operations	3
CULN1210	Servsafe Certification.....	1
CULN1215	Stocks, Soups, Sauces.....	3
CULN1220	Introduction to Pantry Food Preparation	2
CULN1230	Vegetables, Potato, Rice and Farinaceous Products .	2
CULN1235	Introduction to Breakfast	2
BUSM1290	Job Seeking/Keeping Skills	1

Suggested Technical Studies Semester II

CULN1245	Basic Baking	3
CULN1250	Basic Cooking Principles.....	4
CULN1265	Basic Food Production Principles.....	3
CULN1270	Garde Manger	4
CULN1275	Social Etiquette.....	2

Suggested Technical Studies Semester III (May Term)

CULN1280	Foodservice Internship.....	2
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General Studies

GBEH1100	Human Relations	3
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Estimated cost of books, supplies and materials: 579

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Dental Assistant

Dental Assistant AAS Degree (60 Credits)



Program Description

The Dental Assistant Program is designed to provide an opportunity for students to acquire background knowledge and develop specialized skills for gaining employment in the dental profession. Specific training is provided in preparing the student for a variety of duties performed by the dental assistant including chairside assisting, infection control procedures, preparing instruments and materials, laboratory procedures, administrative duties and expanded functions such as mechanical polishing and application of sealants.

Degree Specific Requirements: A background check, including fingerprinting, will be completed as a requirement of this program. At the time of the background check submission, students must provide documentation as required by the MN Department of Human Services. If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study, or on your ability to obtain federal, state, and other higher education financial aid. Students who have earned a grade of "C" or better, in all required classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the AAS degree.

Program Accreditation Information: The Dental Assistant Program is accredited by the Commission on Dental Accreditation of the American Dental Association, 211 East Chicago Avenue, Chicago, IL 60611, (312) 440-4563, <http://www.ada.org/en/coda>. Graduates will be eligible to write the Dental Assisting National Board Certification examination and the Minnesota Licensure examination.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC)

Career Opportunities

Dental Assistants' schedules are often flexible and include full-time and part-time opportunities in a variety of settings including general dental practices, public health clinics, insurance companies, dental education facilities and specialty practices such as orthodontics and oral surgery.

Technical Studies Pre-requisites:

MNTC Goal Area 1 Communication (Oral)	3
MNTC Goal Area 1 Communications (Written)	3
MNTC Goal Area 3 Natural Science	4

Prior to entering the Dental Assistant program, students must complete the Accuplacer test with scores above the cutoff point in reading comprehension or successful completion of equivalent general education course work.

In addition the following must be completed: A medical examination, vaccinations against Hepatitis B or a signed release form, Mantoux test, mandatory attendance at an information meeting and background check. Current CPR, AHA Healthcare Provider certification required

Suggested Technical Studies Semester I

DENT1400 Dental Sciences.....	3
DENT1405 Introduction to Dental Assisting	2
DENT1413 Preclinical Dental Assisting.....	2
DENT1415 Infection Control in the Dental Environment	2

Suggested Technical Studies Semester II

DENT1425 Chairside Assisting I.....	3
DENT1435 Dental Materials.....	3
DENT1441 Dental Radiology I.....	3
DENT1445 Expanded Functions I	3

Suggested Technical Studies Semester III

DENT2406 Dental Health.....	1
DENT2424 Chairside Assisting II.....	4
DENT2447 Dental Radiology II	3
DENT2454 Expanded Functions II.....	4

Suggested Technical Studies Semester IV

DENT2413 Dental Practice Management.....	2
DENT2461 Internship	7
DENT2486 Internship Seminar.....	1
DENT2488 Dental Ethics and Jurisprudence.....	1

General Education

MNTC Psychology	3
MNTC Goal Area 2, 6, 7, 8, 9, or 10	3

Estimated cost of books, supplies and materials: 5,550

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Dental Assistant

Dental Assistant Diploma (53 Credits)



Program Description

The Dental Assistant diploma is designed to provide an opportunity for students to acquire background knowledge and develop specialized skills for gaining employment in the dental profession. Specific training is provided in preparing the student for a variety of duties performed by the dental assistant including chairside assisting, infection control procedures, preparing instruments and materials, laboratory procedures, administrative duties and expanded functions such as mechanical polishing and application of sealants.

Degree Specific Requirements: A background check, including fingerprinting, will be completed as a requirement of this program. At the time of the background check submission, students must provide documentation as required by the MN Department of Human Services. If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study, or on your ability to obtain federal, state, and other higher education financial aid. Students who have earned a grade of "C" or better, in all required classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements the diploma.

Accreditation Information: The Dental Assistant Program is accredited by the Commission on Dental Accreditation of the American Dental Association, 211 East Chicago Avenue, Chicago, IL 60611, (312) 440-4563, <http://www.ada.org/en/coda>. Graduates will be eligible to write the Dental Assisting National Board Certification examination and the Minnesota Licensure examination.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC). The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Dental Assistants' schedules are often flexible and include full-time and part-time opportunities in a variety of settings including general dental practices, public health clinics, insurance companies, dental education facilities and specialty practices such as orthodontics and oral surgery.

Technical Studies Pre-requisites:

ENGL1100 Writing for the Workplace 3
GBEH1100 Human Relations 3

Current CPR, AHA Healthcare Provider required

Prior to entering the Dental Assistant program, students must complete the Accuplacer test with scores above the cutoff point in reading comprehension or successful completion of equivalent general education course work.

In addition the following must be completed: A medical examination, vaccinations against Hepatitis B or a signed release form, Mantoux test, mandatory attendance at an informational meeting, and background check.

Suggested Technical Studies Semester I

DENT1400 Dental Sciences..... 3
DENT1405 Introduction to Dental Assisting 2
DENT1413 Preclinical Dental Assisting..... 2
DENT1415 Infection Control in the Dental Environment 2

Suggested Technical Studies Semester II

DENT1425 Chairside Assisting I..... 3
DENT1435 Dental Materials..... 3
DENT1441 Dental Radiology I..... 3
DENT1445 Expanded Functions I 3

Suggested Technical Studies Semester III

DENT2406 Dental Health..... 1
DENT2424 Chairside Assisting II..... 4
DENT2447 Dental Radiology II 3
DENT2454 Expanded Functions II..... 4

Suggested Technical Studies Semester IV

DENT2413 Dental Practice Management..... 2
DENT2461 Internship 7
DENT2486 Internship Seminar..... 1
DENT2488 Dental Ethics and Jurisprudence..... 1

General Education

MNTC - Psychology 3

Estimated cost of books, supplies and materials: 5,110

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Dental Hygienist

Dental Hygiene AAS Degree (80 Credits)



Program Description

The Dental Hygiene Program provides the students with academic and clinical opportunities to acquire the knowledge, skills and attitude necessary to become a dental hygiene professional. A dental hygienist is a member of the dental team who provides direct care to patients under the supervision of a licensed dentist. Patient assessments, taking radiographs, teeth cleaning and polishing, applying preventive agents, nonsurgical periodontal therapies (scaling & root planing), and administering local anesthesia and nitrous oxide.

Upon graduation, students must successfully complete the National Dental Hygiene Board Exam, the Central Regional Board Exam and then obtain a license in the state they wish to practice.

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons: national or international program certification, national or international standards including skill standards, standards recommended by a primary employer or multiple employers, national specialized program accreditation, state licensure requirements, and/or national practices or standards.

Degree Specific Program Requirements: A background check, including fingerprinting, will be completed as a requirement of this program. At the time of the background check submission, students must provide documentation as required by the MN Department of Human Services. If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study, or on your ability to obtain federal, state, and other higher education financial aid. Students who have earned a grade of "C" or better, in all required classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the AAS degree.

Accreditation Information: The Dental Hygiene program is accredited by the Commission on Dental Accreditation of the American Dental Association, 211 East Chicago Avenue, Chicago, IL 60611, (312) 440-4563, <http://www.ada.org/en/coda>.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Licensed dental hygienists can work in many different settings: clinical dental offices, nursing homes, public health agencies, dental and pharmaceutical companies, teaching in dental hygiene education programs and doing dental research.

Technical Studies Pre-requisites:

Human Anatomy/Physiology I (w/lab).....	3
Human Anatomy/Physiology II (w/lab).....	3
Microbiology (w/lab).....	3
Introduction to General Chemistry (w/lab).....	3
MNTC Goal Area 1 Communications Oral.....	3
MNTC Goal Area 1 Communications Written.....	3
MNTC Goal Area 5 Psychology.....	3
MNTC Goal Area 5 Sociology.....	3
PHIL1320 Ethics.....	3

*Applicant may apply only after successful completion of 3 of the 4 science courses listed above. Priority will be given to those students who have completed all 4 of the science courses listed above at an accredited college or university and to those students who have completed the largest portion of the general education component.

*Dental Hygiene applicants: Students being considered for admission into the SCTCC Dental Hygiene program will be limited to retaking classes: a maximum of 1 retake for a science prerequisite course and a maximum of 1 retake for a required general education course.

Suggested Technical Studies Semester I

DEHY1400 Dental Hygiene Seminar I.....	2
DEHY1414 Nutrition and Dental Hygiene.....	2
DEHY1418 Introduction to Radiology.....	2
DEHY1424 Head, Neck and Dental Anatomy.....	3
DEHY1428 General & Oral Pathology.....	3
DEHY1480 Pre-Clinical Dental Hygiene I.....	3

Suggested Technical Studies Semester II

DEHY1402 Dental Hygiene Seminar II.....	2
DEHY1410 Introduction to Dental Materials and Methods.....	2
DEHY1422 Dental Pharmacology.....	2
DEHY1448 Dental Hygiene Radiology II.....	2
DEHY1460 Periodontics I.....	2
DEHY1485 Clinical Dental Hygiene II.....	4

Suggested Technical Studies Semester III

DEHY1404 Clinical Seminar III.....	2
DEHY1421 Dental Hygiene Materials and Methods.....	1
DEHY1440 Community Dental Health I.....	2
DEHY1468 Pain Management.....	2
DEHY1486 Clinical Dental Hygiene III.....	6

Suggested Technical Studies Semester IV

DEHY1406 Clinical Seminar IV.....	2
DEHY1445 Community Dental Health II.....	1
DEHY1464 Periodontics II.....	1
DEHY1488 Clinical Dental Hygiene IV.....	6
DEHY1490 Dental Hygiene Licensure and Jurisprudence.....	1

Estimated cost of books, supplies and materials: 7,580

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Electrical Construction Technology

Electrical Construction Technology AAS Degree (81 Credits)



Program Description

The Electrical Construction Technology Program prepares students for a career as an electrician. The program begins with basic principles and progresses to more technical information. The early part of the program includes D.C. theory, related math, National Electrical Code, shop skills and safety. Students will learn to apply knowledge to actual projects in the shop or mock-ups. Students will receive training in A.C. and D.C. motor and generator theory, transformers, lighting, three phase systems, motor control, solid state, variable frequency drives (VFD) and programmable logic controls (PLC).

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons: national or international program certification, national or international standards including skill standards, standards recommended by a primary employer or multiple employers, national specialized program accreditation, state licensure requirements, and/or national practices or standards.

Accreditation Information: The Electrical Construction Technology Program is approved by MN Department of Labor and Industry, 443 Lafayette Road N., St. Paul, MN 55155, (651) 284-5005, www.dli.mn.gov. Credit is given toward the state electrical license upon completion of this two year course.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

After completing an apprenticeship, the graduate may be eligible to take the state examination for a journey person's license. A master electrician's license can be obtained after an electrician has worked for a number of years and gained further knowledge and skills. The Minnesota State Board of Electricity recognizes this program for credit towards the license.

The properly trained electrician will be called upon to wire buildings ranging from private homes to industrial plants. An electrician may perform maintenance work in industrial plants, office buildings, hospitals, or public buildings. Some electricians may specialize in particular fields such as motor rewinding, machine tool manufacture, appliance repair, or industrial controls.

Suggested Technical Studies Semester I

ELEC1502	Wiring and Materials I.....	5
ELEC1510	National Electrical Code I.....	2
ELEC1518	Applied Electrical Principles & Formulas.....	5
ELEC1523	Drafting Blueprint Reading and Specification.....	4

Suggested Technical Studies Semester II

ELEC1506	Wiring and Materials II.....	5
ELEC1515	National Electrical Code II.....	3
ELEC1526	Applied Electrical Principles & A.C. Fund.	5
ELEC1530	Electric Heat	2
ELEC1534	Safety, Certifications and Skills.....	3

Suggested Technical Studies Semester III

ELEC1538	Industry Skills Development	1
ELEC2502	Residential Wiring I.....	2
ELEC2510	National Electrical Code III.....	2
ELEC2519	Commercial Wiring	3
ELEC2520	Commercial Lighting.....	2
ELEC2522	AC Motor Control I.....	3
ELEC2538	Transformers, Three Phase Systems, and Formulas .	3

Suggested Technical Studies Semester IV

ELEC2506	Residential Wiring II.....	2
ELEC2514	National Electrical Code IV.....	2
ELEC2526	A.C. Motor Control II.....	4

ELEC2532	Solid State & PLC Controls.....	3
ELEC2534	Industrial Systems.....	3
ELEC2540	Low Voltage Systems.....	1
EMSC1420	AHA Heartsaver CPR and First Aid.....	1

General Education

MNTC Goal Area 1 Communications Oral	3
MNTC Goal Area 1 Communications Written	3
MNTC Goal Area 6 Humanities	3
MNTC Goal Area 4 Mathematics and Logic	3
MNTransfer General Education Electives	3

Estimated cost of books, supplies and materials: 2,375

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Electrical Construction Technology

Electrical Construction Technology Diploma (72 Credits)



Program Description

The Electrical Construction Technology Program prepares students for a career as an electrician. The program begins with basic principles and progresses to more technical information. The early part of the program includes D.C. theory, related math, National Electrical Code, shop skills and safety. Students will learn to apply knowledge to actual projects in the shop or mock-ups. Students will receive training in A.C. and D.C. motor and generator theory, transformers, lighting, three phase systems, motor control, solid state, variable frequency drives (VFD) and programmable logic controls (PLC).

Accreditation Information: The Electrical Construction Technology Program is approved by MN Department of Labor and Industry, 443 Lafayette Road N., St. Paul, MN 55155, (651) 284-5005, www.dli.mn.gov. Credit is given toward the state electrical license upon completion of this two year course. Credit is given toward the state electrical license upon completion of this two year course.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

After completing an apprenticeship, the graduate may be eligible to take the state examination for a journeyperson's license. A master electrician's license can be obtained after an electrician has worked for a number of years and gained further knowledge and skills. The Minnesota State Board of Electricity recognizes this program for credit towards the license.

The properly trained electrician will be called upon to wire buildings ranging from private homes to industrial plants. An electrician may perform maintenance work in industrial plants, office buildings, hospitals, or public buildings. Some electricians may specialize in particular fields such as motor rewinding, machine tool manufacture, appliance repair, or industrial controls.

Suggested Technical Studies Semester I

ELEC1502	Wiring and Materials I.....	5
ELEC1510	National Electrical Code I.....	2
ELEC1518	Applied Electrical Principles & Formulas.....	5
ELEC1523	Drafting Blueprint Reading and Specification.....	4

Suggested Technical Studies Semester II

ELEC1506	Wiring and Materials II.....	5
ELEC1515	National Electrical Code II.....	3
ELEC1526	Applied Electrical Principles & A.C. Fund.	5
ELEC1530	Electric Heat	2
ELEC1534	Safety, Certifications and Skills.....	3

Suggested Technical Studies Semester III

ELEC1538	Industry Skills Development	1
ELEC2502	Residential Wiring I.....	2
ELEC2510	National Electrical Code III.....	2
ELEC2519	Commercial Wiring	3
ELEC2520	Commercial Lighting.....	2
ELEC2522	AC Motor Control I.....	3
ELEC2538	Transformers, Three Phase Systems, and Formulas .	3

Suggested Technical Studies Semester IV

ELEC2506	Residential Wiring II.....	2
ELEC2514	National Electrical Code IV.....	2
ELEC2526	A.C. Motor Control II.....	4

ELEC2532	Solid State & PLC Controls.....	3
ELEC2534	Industrial Systems.....	3
ELEC2540	Low Voltage Systems.....	1
EMSC1420	AHA Heartsaver CPR and First Aid.....	1

General Studies

General Studies	6
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Estimated cost of books, supplies and materials: 2,015

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Energy And Electronics

Energy Technical Specialist AAS Degree (60 Credits)



Program Description

This degree program has been developed to train students in the field of energy technology. The Energy Technical Specialist Associate in Applied Science degree will convey the skills and knowledge necessary to be successful in both the traditional and renewable energy fields.

Students enrolled in the Energy Technical Specialist program will study core curriculum providing a strong base in electrical, electronic and mechanical systems. Students may select an area of specialization to complete their program of study from the following: Wind Energy, Ethanol, Biodiesel, Fossil Fuels, or Power Generation.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

The Energy Technical specialist AAS program trains students to work in the growing field of energy and electronics.

Suggested Technical Studies Semester I

ETEC1511	DC Electronics.....	3
ETEC1512	AC Electronics.....	3
ETEC1515	Industrial Safety.....	2
ETEC1517	Maintenance Process and Production	2
RNEW1300	Introduction to Renewable Energy	3

Suggested Technical Studies Semester II

ETEC1507	Digital Electronics	3
ETEC1524	Print Reading and Design	2
ETEC1528	Maintenance Awareness.....	2

Suggested Technical Studies Semester III

ETEC2515	Introduction to Process Control.....	3
ETEC2521	Mechanical Systems	3
ETEC2535	Fluid Power and Control.....	4

Suggested Technical Studies Semester IV

ETEC2543	Programmable Logic Control	3
ETEC2546	Power Plant Technology	4
ETEC2547	Mechanical Fundamentals for Process Control	3
ETEC2570	Advanced Mechanical Systems	3
TECH1552	Basic Metal Joining and Fabrication	2

General Education

MNTC Goal 1 Communications (Written)	
ENGL 1302 RECOMMENDED	3
MNTC Goal 3 Environmental Science	3
MNTC Goal 3 Physics or Chemistry	
PHYS 2300 RECOMMENDED	3
MNTC Goal 4 Mathematics *MATH 1300 RECOMMENDED* ..	3
MNTransfer General Education Electives	3

Estimated cost of books, supplies and materials: 2,472

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Energy And Electronics

Energy Technical Specialist-Nuclear AAS Degree (74 Credits)



Program Description

The Energy Technical Specialist-Nuclear AAS Degree prepares student with both electrical and mechanical technician skills to work at a nuclear facility. This program strives to give students the core training in which safety is paramount. The curriculum meets the national standards for nuclear power generation. SCTCC has partnered with energy consortiums and power generation companies to establish this major and ensure it meets industry and regulatory requirements.

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons: national or international program certification, national or international standards including skill standards, standards recommended by a primary employer or multiple employers, national specialized program accreditation, state licensure requirements, and/or national practices or standards.

Degree Specific Program Requirements: Students in this program have the opportunity to do a job shadow at the local nuclear plant. The nuclear plant requires full access badging, background checks and drug/alcohol screening. Students must earn a grade of B or higher in each required course to meet the program requirements. This program does not accept general education transfer courses to meet program requirements.

Accreditation Information: The Energy Technical Specialist Program – Nuclear is accredited by the Nuclear Energy Institute, 1201 F St. NW, Suite 1100, Washington, D.C. 20004-1218, (202) 739-8000, Fax: (202) 785-4019, <http://www.nei.org>.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Graduates of this program receive a nationally recognized certificate that is accepted at all nuclear facilities. Graduates of the program will have the skills and knowledge necessary to obtain entry-level employment in the nuclear energy industry.

Suggested Technical Studies Semester I

ETEC1511	DC Electronics.....	3
ETEC1512	AC Electronics.....	3
ETEC1515	Industrial Safety.....	2
ETEC1517	Maintenance Process and Production.....	2
RNEW1300	Introduction to Renewable Energy.....	3

Suggested Technical Studies Semester II

ETEC1507	Digital Electronics.....	3
ETEC1524	Print Reading and Design.....	2
ETEC1528	Maintenance Awareness.....	2

Suggested Technical Studies Semester III (Summer)

NUCP2500	Nuclear Energy Fundamentals.....	3
NUCP2512	Nuclear Plant In Processing.....	1
NUCP2516	Nuclear Plant Electrical Job Shadow.....	1
NUCP2520	Nuclear Plant Mechanical Job Shadow.....	1

Suggested Technical Studies Semester IV

ETEC2515	Introduction to Process Control.....	3
ETEC2521	Mechanical Systems.....	3
ETEC2535	Fluid Power and Control.....	4
NUCP2504	Nuclear Plant Materials and Protection.....	4

Suggested Technical Studies Semester V

ETEC2543	Programmable Logic Control.....	3
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ETEC2546	Power Plant Technology.....	4
ETEC2547	Mechanical Fundamentals for Process Control.....	3
ETEC2570	Advanced Mechanical Systems.....	3
NUCP2508	Nuclear Plant Operating Systems.....	4
TECH1552	Basic Metal Joining and Fabrication.....	2

General Education

ENGL1302	Analytical Writing.....	4
ENVR1305	Environmental Science.....	4
PHYS2300	General Physics.....	4
MATH1300	College Algebra.....	3

Estimated cost of books, supplies and materials: 2,472

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Energy And Electronics

Instrumentation & Process Control AAS Degree (60 Credits)



Program Description

The Instrumentation and Process Control program prepares individuals to apply electronic engineering principles and technical skills in the fields of instrumentation measurement and industrial control systems, automated systems, process control, plant equipment maintenance, embedded micro controllers, and data acquisition systems. This program prepares individuals with knowledge and skills in the areas of AC/DC electronics, digital and analog circuits, use of electronic test equipment, use of computers for analysis and problem solving, reading electrical schematics and system diagrams, process and instrument diagrams, scientific methods, and problem solving skills.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Graduates from this program find exciting opportunities as electro-mechanical technicians who install, maintain, and repair electronic equipment and automated systems used in a variety of industries. Examples include aerospace, paper manufacturing, food processing, petro-chemical production, power generation, mining, municipal water and waste water treatment, plant maintenance, medical device testing and calibration, and environmental monitoring and control systems.

Suggested Technical Studies Semester I

ETEC1511	DC Electronics.....	3
ETEC1512	AC Electronics.....	3
ETEC1515	Industrial Safety.....	2
ETEC1517	Maintenance Process and Production	2

Suggested Technical Studies Semester II

ETEC1507	Digital Electronics	3
ETEC1524	Print Reading and Design	2
ETEC1526	Quality Practice	2
ETEC1528	Maintenance Awareness.....	2
ETEC1535	Networking Systems.....	2

Suggested Technical Studies Semester III

ETEC2515	Introduction to Process Control.....	3
ETEC2535	Fluid Power and Control.....	4
ETEC2541	Electrical Motors and Control Systems	3

Suggested Technical Studies Semester IV

ETEC2532	Instrumentation Control and Data Acquisition.....	4
ETEC2542	Electric Motor Control II.....	3
ETEC2543	Programmable Logic Control	3
ETEC2544	Automated Manufacturing Systems	3

General Education

ENGL1303	Technical Writing	3
MATH1300	College Algebra	3
PHYS1305	Conceptual Physics	4
CRTK1300	Critical Thinking	3
MNTC	Goal Area 5 Social Sciences	3

Estimated cost of books, supplies and materials: 2,107

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Energy And Electronics

Instrumentation & Process Control Diploma (54 Credits)



Program Description

The Instrumentation and Process Control program prepares individuals to apply electronic engineering principles and technical skills in the fields of instrumentation measurement and industrial control systems, automated systems, process control, plant equipment maintenance, embedded micro controllers, and data acquisition systems. This program prepares individuals with knowledge and skills in the areas of AC/DC electronics, digital and analog circuits, use of electronic test equipment, use of computers for analysis and problem solving, reading electrical schematics and system diagrams, process and instrument diagrams, scientific methods, and problem solving skills.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).
The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Graduates from this program find exciting opportunities as electro-mechanical technicians who install, maintain, and repair electronic equipment and automated systems used in a variety of industries. Examples include aerospace, paper manufacturing, food processing, petro-chemical production, power generation, mining, municipal water and waste water treatment, plant maintenance, medical device testing and calibration, and environmental monitoring and control systems.

Suggested Technical Studies Semester I

ETEC1511	DC Electronics.....	3
ETEC1512	AC Electronics.....	3
ETEC1515	Industrial Safety.....	2
ETEC1517	Maintenance Process and Production	2

Suggested Technical Studies Semester II

ETEC1507	Digital Electronics	3
ETEC1524	Print Reading and Design	2
ETEC1526	Quality Practice	2
ETEC1528	Maintenance Awareness.....	2
ETEC1535	Networking Systems.....	2

Suggested Technical Studies Semester III

ETEC2515	Introduction to Process Control.....	3
ETEC2535	Fluid Power and Control.....	4
ETEC2541	Electrical Motors and Control Systems	3

Suggested Technical Studies Semester IV

ETEC2532	Instrumentation Control and Data Acquisition.....	4
ETEC2542	Electric Motor Control II.....	3
ETEC2543	Programmable Logic Control	3

General Education

GBEH1100	Human Relations	3
ENGL1100	Writing for the Workplace	3
MATH1300	College Algebra	3
PHYS1305	Conceptual Physics.....	4

Estimated cost of books, supplies and materials: 2,147

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Energy And Electronics

Mechatronics AAS Degree (60 Credits)



Program Description

The Mechatronics Program prepares individuals to apply electronic engineering principles and technical skills in the fields of instrumentation and industrial control systems, digital and analog circuits, automated manufacturing and robotics, manufacturing and facilities maintenance, embedded micro controllers, and telecommunications systems. The program prepares individuals with knowledge and skills in the areas of AC/DC electronics, digital and analog circuits, use of electronic test equipment, use of computers for analysis and problem solving, reading electrical schematics and system diagrams, scientific methods, and problem solving skills. Additional topics include programmable logic controllers (PLCs), industrial automation, process control systems, instrumentation techniques and calibration, microcomputer hardware and network support, computer programming, telecommunications systems, computer aided drafting, and statistical process control.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC). The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Graduates from this program find exciting opportunities as electro-mechanical technicians who install, maintain, and repair electronic equipment and automated systems used in a variety of industries. Examples include aerospace, paper manufacturing, food processing, petro-chemical production, power generation, mining, municipal water and waste water treatment, plant maintenance, medical device testing and calibration, and environmental monitoring and control systems.

Suggested Technical Studies Semester I

ETEC1511	DC Electronics.....	3
ETEC1512	AC Electronics.....	3
ETEC1515	Industrial Safety.....	2
ETEC1517	Maintenance Process and Production.....	2
TECH1552	Basic Metal Joining and Fabrication.....	2

Suggested Technical Studies Semester II

ETEC1507	Digital Electronics.....	3
ETEC1524	Print Reading and Design.....	2
ETEC1526	Quality Practice.....	2
ETEC1528	Maintenance Awareness.....	2
ETEC1535	Networking Systems.....	2

Suggested Technical Studies Semester III

ETEC2521	Mechanical Systems.....	3
ETEC2525	FANUC Robotics Certification.....	2
ETEC2535	Fluid Power and Control.....	4
ETEC2541	Electrical Motors and Control Systems.....	3

Suggested Technical Studies Semester IV

ETEC2542	Electric Motor Control II.....	3
ETEC2543	Programmable Logic Control.....	3
ETEC2570	Advanced Mechanical Systems.....	3

General Education

ENGL1303	Technical Writing.....	3
MATH1300	College Algebra.....	3
PHYS1305	Conceptual Physics.....	4
CRTK1300	Critical Thinking.....	3
MNTC Goal Area 5	Social Sciences.....	3

Estimated cost of books, supplies and materials: 2,521

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Energy And Electronics

Mechatronics Certificate (30 Credits)



Program Description

The Mechatronics certificate program prepares individuals with a fundamental knowledge of AC/DC electronics, digital and analog circuits, use of electronic test equipment, use of computers for analysis and problem solving, and reading electronic schematics.

Career Opportunities

Graduates from this program coupled with prior experience or other education experiences find exciting opportunities in a variety of fields, such as, selling electronic equipment, alarm and security system installers, and electronic assembly. They may also use this certificate to transfer to other programs in electronics, such as biomedical technician, instrumentation and process control technician, and electronics technician programs.

Suggested Technical Studies Semester I

ETEC1511	DC Electronics.....	3
ETEC1512	AC Electronics.....	3
ETEC1515	Industrial Safety.....	2
ETEC1517	Maintenance Process and Production.....	2
MATH1300	College Algebra.....	3
TECH1530	Computer Applications.....	2

Suggested Technical Studies Semester II

ETEC1507	Digital Electronics.....	3
ETEC1524	Print Reading and Design.....	2
ETEC1526	Quality Practice.....	2
ETEC1528	Maintenance Awareness.....	2
ETEC1535	Networking Systems.....	2
PHYS1305	Conceptual Physics.....	4

Estimated cost of books, supplies and materials: 1,741

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Energy And Electronics

Mechatronics Diploma (55 Credits)



Program Description

The Mechatronics Program prepares individuals to apply electronic engineering principles and technical skills in the fields of instrumentation and industrial control systems, digital and analog circuits, automated manufacturing and robotics, manufacturing and facilities maintenance, embedded micro controllers, and telecommunications systems. The program prepares individuals with knowledge and skills in the areas of AC/DC electronics, digital and analog circuits, use of electronic test equipment, use of computers for analysis and problem solving, reading electrical schematics and system diagrams, scientific methods, and problem solving skills. Additional topics include programmable logic controllers (PLCs), industrial automation, process control systems, instrumentation techniques and calibration, microcomputer hardware and network support, computer programming, telecommunications systems, computer aided drafting, and statistical process control.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC). The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Graduates from this program find exciting opportunities as electro-mechanical technicians who install, maintain, and repair electronic equipment and automated systems used in a variety of industries. Examples include aerospace, paper manufacturing, food processing, petro-chemical production, power generation, mining, municipal water and waste water treatment, plant maintenance, medical device testing and calibration, and environmental monitoring and control systems.

Suggested Technical Studies Semester I

ETEC1511	DC Electronics.....	3
ETEC1512	AC Electronics.....	3
ETEC1515	Industrial Safety.....	2
ETEC1517	Maintenance Process and Production.....	2

Suggested Technical Studies Semester II

ETEC1507	Digital Electronics.....	3
ETEC1524	Print Reading and Design.....	2
ETEC1526	Quality Practice.....	2
ETEC1528	Maintenance Awareness.....	2
ETEC1535	Networking Systems.....	2

Suggested Technical Studies Semester III

ETEC2521	Mechanical Systems.....	3
ETEC2525	FANUC Robotics Certification.....	2
ETEC2535	Fluid Power and Control.....	4
ETEC2541	Electrical Motors and Control Systems.....	3

Suggested Technical Studies Semester IV

ETEC2542	Electric Motor Control II.....	3
ETEC2543	Programmable Logic Control.....	3
ETEC2570	Advanced Mechanical Systems.....	3

General Studies

GBEH1100	Human Relations.....	3
ENGL1100	Writing for the Workplace.....	3
MATH1300	College Algebra.....	3
PHYS1305	Conceptual Physics.....	4

Estimated cost of books, supplies and materials: 2,161

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Energy And Electronics

Robotics And Automation Technology AAS Degree (60 Credits)



Program Description

The Robotics and Automation Technology program prepares individuals for the future of manufacturing. As production systems become more streamlined, the equipment that is used becomes more complex. Employers are looking for intelligent technicians who can build, repair, install, maintain, and program manufacturing equipment, as well as solve engineering problems and design robotic and automated systems. This program prepares individuals with knowledge and skills in the areas of Robotic Programming, Electronics, Flexible Manufacturing, CAD Systems, Industrial Communications and Overall System Integration. Technologies such as robot controllers, sensors, and electrical control systems have created a need for highly specialized training that this degree offers.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Graduates from the Robotics and Automation Technology program find exciting employment opportunities as robotics/automation technicians in building, installing, maintaining, programming and repairing robotic & automated equipment used in a variety of industries such as, automated manufacturing, robotics, aerospace, paper manufacturing, food processing, petro-chemical production, power generation, mining, maintenance and telecommunications.

Suggested Technical Studies Semester I

ETEC1511	DC Electronics.....	3
ETEC1512	AC Electronics.....	3
ETEC1515	Industrial Safety.....	2
ETEC1517	Maintenance Process and Production	2

Suggested Technical Studies Semester II

ETEC1507	Digital Electronics	3
ETEC1524	Print Reading and Design	2
ETEC1526	Quality Practice	2
ETEC1528	Maintenance Awareness.....	2
ETEC1535	Networking Systems.....	2

Suggested Technical Studies Semester III

ETEC2521	Mechanical Systems	3
ETEC2525	FANUC Robotics Certification.....	2
ETEC2535	Fluid Power and Control.....	4
ETEC2541	Electrical Motors and Control Systems	3

Suggested Technical Studies Semester IV

ETEC2542	Electric Motor Control II.....	3
ETEC2543	Programmable Logic Control	3
ETEC2551	Robotic Operations	3
ETEC2575	Vision Systems for Robots.....	2

General Education

ENGL1303	Technical Writing	3
MATH1300	College Algebra	3
PHYS1305	Conceptual Physics.....	4
CRTK1300	Critical Thinking	3
MNTC	Goal Area 5 Social Sciences	3

Estimated cost of books, supplies and materials: 2,492

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Energy And Electronics

Robotics And Automation Technology Diploma (57 Credits)



Program Description

The Robotics and Automation Technology program prepares individuals for the future of manufacturing. As production systems become more streamlined, the equipment that is used becomes more complex. Employers are looking for intelligent technicians who can build, repair, install, maintain, and program manufacturing equipment, as well as solve engineering problems and design robotic and automated systems. This program prepares individuals with knowledge and skills in the areas of Robotic Programming, Electronics, Flexible Manufacturing, CAD Systems, Industrial Communications and Overall System Integration. Technologies such as new generation robot controllers, sensors, and electrical control systems have created a need for a highly specialized training that this degree offers.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC). The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Graduates from the Robotics and Automation Technology program find exciting employment opportunities as robotics/automation technicians in building, installing, maintaining, programming and repairing robotic & automated equipment used in a variety of industries such as, automated manufacturing, robotics, aerospace, paper manufacturing, food processing, petro-chemical production, power generation, mining, maintenance and telecommunications.

Suggested Technical Studies Semester I

ETEC1511	DC Electronics.....	3
ETEC1512	AC Electronics.....	3
ETEC1515	Industrial Safety.....	2
ETEC1517	Maintenance Process and Production.....	2

Suggested Technical Studies Semester II

ETEC1507	Digital Electronics.....	3
ETEC1524	Print Reading and Design.....	2
ETEC1526	Quality Practice.....	2
ETEC1528	Maintenance Awareness.....	2
ETEC1535	Networking Systems.....	2

Suggested Technical Studies Semester III

ETEC2521	Mechanical Systems.....	3
ETEC2525	FANUC Robotics Certification.....	2
ETEC2535	Fluid Power and Control.....	4
ETEC2541	Electrical Motors and Control Systems.....	3

Suggested Technical Studies Semester IV

ETEC2542	Electric Motor Control II.....	3
ETEC2543	Programmable Logic Control.....	3
ETEC2551	Robotic Operations.....	3
ETEC2575	Vision Systems for Robots.....	2

General Education

GBEH1100	Human Relations.....	3
ENGL1100	Writing for the Workplace.....	3
MATH1300	College Algebra.....	3
PHYS1305	Conceptual Physics.....	4

Estimated cost of books, supplies and materials: 2,492

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Farm Management

Farm Business Management Diploma (60 Credits)

Advanced Farm Business Management Certificate (30 Credits)



Program Description

The Farm Business Management Program is concerned with the economic principles and agricultural practices used in making decisions about alternative ways of using land, labor, capital and management ability to make a profit in farming. Information about farm business relationships, legal aspects of estate planning, partnerships, trusts, and business transfers from older to younger farmers is available when needed.

Students learn a system of a farm business record keeping necessary for computerized farm business analysis. This is the core of the instructional program. Instructional activities include the annual series of class meetings and individual conferences with farmers and others concerned with a farm operated by a family unit. Instruction is based on the economic, social, and cultural goals of the family and business unit.

DIPLOMA Technical Courses

Year 1

FBMT1211	Introduction to Farm Business Management.....	4
FBMT1112	Foundations for Farm Business Management	4
FBMT1213	Managing a Farm System in a Global Economy	2

Year 2

FBMT1121	Preparation for Farm Business Analysis.....	4
FBMT1122	Implementing the System Management Plan	4
FBMT1223	Using System Analysis in Total Farm Planning	2

Year 3

FBMT1131	Managing and Modifying Farm System Data	4
FBMT1132	Interpreting and Using Farm System Data	4
FBMT1233	Application of Productive Enterprise Information ...	2

Year 4

FBMT2141	Interpreting and Evaluation of Financial Data.....	4
FBMT2142	Interpreting Trends in Business Planning	4
FBMT2243	Using Financial Instruments in Farm System Management.....	2

Year 5

FBMT2151	Strategies in Farm System Data Management.....	4
FBMT2152	Integrating System Information for Financial Planning	4
FBMT2253	System Plans and Projections	2

Year 6

FBMT2161	Examination of the Context of Farm System Management.....	4
FBMT2162	Refining Farm System Management	4
FBMT2263	Evaluating Farm System Programs	2

Advanced Certificate Technical Courses

Year 1

FBMT2930	Fundamentals of Financial Mgmt. as it relates to Risk Mgmt.....	3
FBMT2931	Applied Financial Management as it relates to Risk Management.....	3
FBMT2950	Directed Study - Decision Making	2
FBMT2951	Directed Study - Communications.....	2

Year 2

FBMT2932	Fundamentals of Financial Mgmt./Strategic Planning Emphasis.....	3
FBMT2933	Applied Financial Mgmt./Strategic Planning Emphasis.....	3
FBMT2952	Directed Studies in Modern Agricultural Technology	2
FBMT2953	Directed Studies in Farm Business and/or Family Transition	2

Year 3

FBMT2934	Fundamental of Financial Management/ Business Plan Emphasis.....	3
FBMT2935	Applications of Financial Management/ Business Plans.....	3
FBMT2954	Directed Study - Personnel Management	2
FBMT2955	Directed Study - Enterprise Alternatives	2

Estimated cost of books, supplies and materials: 325

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Finance And Credit

Finance And Credit AAS Degree (60 Credits)



Program Description

The Finance and Credit Program will prepare students for career opportunities in the Finance and Credit industry. Preparing students for a diverse employment market, courses cover a variety of business related areas including accounting, banking, communications, computer applications, management, math, and sales.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Finance and Credit graduates have found many job opportunities in a variety of businesses such as commercial banks, credit unions, finance companies, collection agencies, medical facilities, mortgage companies, property management associations, and in the credit departments of retail, wholesale, and service organizations.

Suggested Technical Studies Semester I

ACCT1215	Accounting Principles I	4
BUSM1267	Introduction to Business	2
CPTR1210	Introduction to Computers.....	3
FNCR1220	Principles of Banking	3

Suggested Technical Studies Semester II

ACCT1216	Accounting Principles II.....	4
ACCT1219	Spreadsheets-Microsoft Excel	2
SAMG1206	Strategic Customer Service.....	3
SAMG1251	Financial Strategies for Business.....	3

Suggested Technical Studies Semester III

BUSM2275	Legal Environment of Business.....	3
FNCR1260	Risk Management and Commercial Real Estate	3
SAMG1211	Professional Sales Fundamentals.....	3
SAMG1215	Principles of Management	3

Suggested Technical Studies Semester IV

FNCR1250	Credit Law	3
FNCR2245	Consumer Lending.....	3
FNCR2275	Internship	3

General Education

ECON1310	Personal Finance.....	3
MNTC Goal Area 1	Communications-Oral	3

MNTC Goal Area 1	Communications-Written	3
MNTC Goal Area 2	Critical Thinking	3
MNTC Goal Area 4	Mathematics and Logic	3

Estimated cost of books, supplies and materials: 2,000

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Finance And Credit

Finance And Credit Diploma (54 Credits)



Program Description

The Finance and Credit Program will prepare students for career opportunities in the Finance and Credit industry. Preparing students for a diverse employment market, courses cover a variety of business related areas including accounting, banking, communications, computer applications, management, math, and sales.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).
The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Finance and Credit graduates have found many job opportunities in a variety of businesses such as commercial banks, credit unions, finance companies, collection agencies, medical facilities, mortgage companies, property management associations, and in the credit departments of retail, wholesale, and service organizations.

Suggested Technical Studies Semester I

ACCT1215	Accounting Principles I	4
BUSM1267	Introduction to Business	2
CPTR1210	Introduction to Computers.....	3
FNCR1220	Principles of Banking	3

Suggested Technical Studies Semester II

ACCT1216	Accounting Principles II.....	4
ACCT1219	Spreadsheets-Microsoft Excel	2
SAMG1206	Strategic Customer Service.....	3
SAMG1251	Financial Strategies for Business.....	3

Suggested Technical Studies Semester III

BUSM2275	Legal Environment of Business.....	3
FNCR1260	Risk Management and Commercial Real Estate	3
SAMG1211	Professional Sales Fundamentals.....	3
SAMG1215	Principles of Management	3

Suggested Technical Studies Semester IV

FNCR1250	Credit Law	3
FNCR2245	Consumer Lending.....	3
FNCR2275	Internship	3

General Education

ECON1310	Personal Finance	3
General Studies - Written Communication		3
General Studies - Human Relations		3

Estimated cost of books, supplies and materials: 2,000

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Health Data Specialist

Health Data Specialist AAS Degree (60 Credits)



Program Description

The Health Data Specialist (HDS) program at SCTCC integrates curriculum from the health information technology and computer programming field to meet the changing data processing needs of the healthcare industry. As healthcare information moves to electronic platforms, the HDS program gives students a solid background in security, database modeling and cryptography, all relevant skills in the storage, maintenance and use of digital healthcare data.

Students will apply computer programming, troubleshooting, and information technology skills to the installation, maintenance, and upgrade of standard, customized or proprietary medical software and associated hardware. The HDS program provides instruction in telecommunications, electronic healthcare records software applications, computer security and data privacy. Students will also use varied electronic health record software applications to replicate patient information and patient encounters. Legal issues and data security and integrity are covered in this program.

Degree Specific Program Requirements:

All students in this program must have a laptop meeting current specifications of the program as found on the SCTCC website. Students who have earned a grade of "C" or better, in all technical classes, as well as an overall GPA of 2.5 or better will have satisfied the program requirements for the AAS degree. If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study, or on your ability to obtain federal, state, and other higher education financial aid.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Jobs in these areas include healthcare integration, healthcare systems analyst, clinical information technology consultant, technology support specialist, data/application analyst, application specialist, documentation specialist, and clinical quality data coordinator.

Suggested Technical Studies Semester I

CMSC1203	Structured Programming Logic	3
CMSC1212	Web Markup Language.....	3
CMSC1225	Java Language I.....	3
HITM1215	Health Information Foundations.....	3
HITM1228	Administrative Medical Terminology.....	3

Suggested Technical Studies Semester II

CMSC1216	Database Modeling I.....	3
CMSC1217	Data Analytics.....	3
CMSC1255	PHP.....	3

Suggested Technical Studies Semester III

CMSC1206	Basic Networking/ Security.....	3
CMSC2201	Database Modeling II	3
HITM2212	Quality Improvement and Healthcare Statistics	3
HITM2220	Legal Aspects of Health Information.....	3

Suggested Technical Studies Semester IV

BUSM1212	Customer Relationship Management.....	3
CMSC2220	Cryptography	3
HITM1240	Computerized Health Information.....	3

General Education

MATH1300	College Algebra	3
MNTC Goal Area 1	Communications-Written	3

MNTC Goal Area 1	Communications-Oral	3
MNTC Goal Area 5	Social Sciences	3
MNTC Goal Area 6	Humanities	3

Estimated cost of books, supplies and materials: 2,350 plus laptop

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Health Information Technology

Health Information Technology AAS Degree (64 Credits)



Program Description

Health Information Management (HIT) combines the disciplines of medicine, information management, and computer technology within the healthcare industry. The Health Information Technology (HIT) curriculum includes courses in computer applications, biological sciences, medicine, and health information collection, processing, retrieval, evaluation, dissemination and management, as well as general education. The provision for technical and managerial experience is an important aspect of the curriculum. The curriculum includes an educational clinical internship, during which students report to a healthcare facility and experience activities in the environment of the workplace.

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons: national or international program certification, national or international standards including skill standards, standards recommended by a primary employer or multiple employers, national specialized program accreditation, state licensure requirements, and/or national practices or standards.

Degree Specific Program Requirements: All students in this program must have a laptop meeting current specifications of the program as found on the SCTCC website. Students who have earned a grade of "C" or better, in all technical courses will have satisfied the program requirements for the AAS degree. If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study, or on your ability to obtain federal, state, and other higher education financial aid. Some students may need to meet site-specific internship requirements which may include completion of the following: confidentiality agreements, health forms, physical examination, drug test(s), immunization, or annual Mantoux (TB) screening.

Accreditation Information: The Health Information Technology Program is accredited by the Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM), 223 North Michigan Avenue, 21st Floor, Chicago, IL 60601-5800, (312) 223-1100, www.cahiim.org .

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Jobs in these areas include healthcare integration, healthcare systems analyst, clinical information technology consultant, technology support specialist, data/application analyst, application specialist, documentation specialist, and clinical quality data coordinator.

Technical Studies Pre-requisites:

*BUSM1207 Basic Keyboarding is a developmental course, required only if students are unable to key text at a speed of 35 words per minute with five or fewer errors on a 2 minute timing. Students must show proof with a high school transcript, Articulated Credit certificate or other documentation showing they have completed a keyboarding course that meets these requirements. Otherwise, this course is available fall and spring semester.

BUSM1207 Basic Keyboarding..... 1

Suggested Technical Studies Semester I

HITM1215 Health Information Foundations..... 3
 HITM1220 Legal Aspects of Health Information..... 3
 HITM1228 Administrative Medical Terminology..... 3
 HITM1229 Administrative Pharmacology 3

Suggested Technical Studies Semester II

HITM1227 ICD-CM Coding 3
 HITM1235 ICD-PCS Coding 2
 HITM1244 Anatomy and Physiology for Health Information 4
 HITM1250 Data and Software Applications for HIT 3

Suggested Technical Studies Semester III

HITM1226 CPT Coding 3
 HITM2204 Administrative Pathophysiology 3

HITM2209 HIT Professional Practice Experience I..... 2
 HITM2212 Quality Improvement and Healthcare Statistics 3
 HITM2215 HIT Management & Supervision..... 3

Suggested Technical Studies Semester IV

HITM1240 Computerized Health Information 3
 HITM2210 Medical Billing and Reimbursement 3
 HITM2211 HIT Professional Practice Experience II 1
 HITM2224 Advanced Medical Coding 3
 HITM2244 HIT Comprehensive Review 1

General Education

MNTC Goal Area 1 Communications Oral 3
 MNTC Goal Area 1 Communications Written 3
 MNTC Goal Area 4 Mathematics and Logic 3
 MNTC Goal Area 2 or 6 Humanities or Critical Thinking 3
 MNTC Goal Area 5 Social Sciences 3

Estimated cost of books, supplies and materials: 3,320

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Health Information Technology

Office Technology Assistant/Medical-Diploma (36 Credits)



Program Description

Medical Office Technology Assistants work with physicians and other medical support staff. The Medical Office Technology students learn insurance coding and reimbursement, computerized medical records, and other medical office procedures.

Degree Specific Program Requirements: All students in this program must have a laptop meeting current specifications of the program as found on the SCTCC website. Students who have earned a grade of "C" or better, in all technical courses will have satisfied the program requirements for the diploma. If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study, or on your ability to obtain federal, state, and other higher education financial aid.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Medical Office Technology Assistants become employed in clinics, hospitals, insurance offices, medical testing facilities, long-term care facilities, and industrial medical facilities. After a few years of employment, the assistants may decide to do remote billing or medical coding.

Technical Studies Pre-requisites:

BUSM1207 Basic Keyboarding..... 1
*BUSM1207 Basic Keyboarding is a developmental course, required only if students are unable to key text at a speed of 35 words per minute with five or fewer errors on a 2 minute timing. Students must show proof with a high school transcript, Articulated Credit certificate or other documentation showing they have completed a keyboarding course that meets these requirements. Otherwise, this course is available fall and spring semester.

Suggested Technical Studies Semester I

HITM1215 Health Information Foundations..... 3
HITM1220 Legal Aspects of Health Information..... 3
HITM1226 CPT Coding 3
HITM1228 Administrative Medical Terminology..... 3
HITM1229 Administrative Pharmacology 3

Suggested Technical Studies Semester II

HITM1227 ICD-CM Coding 3
HITM1235 ICD-PCS Coding 2
HITM1240 Computerized Health Information..... 3
HITM1244 Anatomy and Physiology for Health Information 4
HITM1250 Data and Software Applications for HIT 3
HITM2210 Medical Billing and Reimbursement..... 3

General Education

DVRS1304 Diversity and Social Justice..... 3

Estimated cost of books, supplies and materials: 2,918

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Health Sciences Broad Field

Health Sciences Broad Field AS Degree (60 Credits)



Program Description

The Health Sciences AS degree is a comprehensive, 60 credit degree designed for students who seek careers in a health field; moreover, it supports transfer to a baccalaureate degree (BS) in a related scientific or technical field such as Nursing, Dental Hygiene, or Kinesiology.

The purpose of this program is to give students a solid foundation in the sciences required for application to the SCTCC Health and Nursing programs and to allow a more seamless transfer to a baccalaureate degree major or program in the sciences, math or other health care or medical field.

HEALTH SCIENCES BROAD FIELD REQUIREMENTS

MNTC Goal 1 Communication

ENGL 1302 Analytical Writing (required)4

AND

Choose one from:

CMST 1320 Intro to Communication Studies OR

CMST 2310 Interpersonal Communication.....3

MNTC Goal 3 Natural Sciences

BLGY 1325 Nutrition3

BLGY 1351 General Biology4

BLGY 2310 Human Anat/Phys I4

BLGY 2320 Human Anat/Phys II.....4

BLGY 2330 Microbiology4

CHEM 1340 Intro to General Chemistry.....4

MNTC Goal Area 4 Mathematical/Logical Reasoning

MATH 1300 College Algebra3

MATH 1350 Intro to Statistics.....3

MNTC Goal 5 Social, Behavior Sciences and History

PSYC 1300 Intro to Psychology3

PSYC 1304 Life Span Development3

MNTC Goal 7 Human Diversity

DVRS 1304 Diversity and Social Justice..... 3

MNTC Goal 9 (and 6) Ethic & Civic Resp.

PHIL 1320 Ethics..... 3

Elective Credits 12

These can be additional MNTC courses or other college level courses including program specific courses. Please consult with your advisor for course selection.

Estimated cost of books, supplies and materials:

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Heating Air Conditioning & Refrigeration

Heating Air Conditioning & Refrigeration Commercial
AAS Degree (72 Credits)



Program Description

The Heating, Air Conditioning, and Refrigeration Technology Program prepares students to enter the heating, ventilation, air conditioning, and refrigeration field. First year emphasizes residential service, maintenance, and installation of forced air furnaces, heat pumps, and air conditioning systems. Second year emphasizes commercial service, maintenance, and installation of heating, air conditioning, and refrigeration systems. Students will gain knowledge in troubleshooting of electrical controls, motors, service and maintenance of refrigeration, heating and air conditioning systems and equipment.

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons: national or international program certification, national or international standards including skill standards, standards recommended by a primary employer or multiple employers, national specialized program accreditation, state licensure requirements, and/or national practices or standards.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Employment is available with heating, air conditioning, and refrigeration service companies; wholesale supply companies; maintenance positions at hospitals, schools, supermarkets, etc. Other positions include sales, installation, and design, and manufacturer representatives. Technicians trained in this field will perform preventive maintenance to keep systems operating efficiently and respond to service calls to perform repairs to systems as needed. Service technicians will work alone much of the time and use their training and knowledge to diagnose systems and perform needed repairs.

Suggested Technical Studies Semester I

HART1502	Copper and Gas Piping	1
HART1510	Sheetmetal.....	1
HART1514	Forced Air Heating	5
HART1518	Electrical Controls for Heating and A/C.....	4
HART1540	Internship - Residential.....	2

Suggested Technical Studies Semester II

HART1506	Schematics & Blue Print Reading	3
HART1522	Installation of Heating and A/C	3
HART1526	Principles of Air Conditioning.....	4
HART1530	Heat Pumps.....	2
HART1534	Troubleshooting Heating & A/C.....	3
HART1538	HART Job Preparation.....	1

Suggested Technical Studies Semester III

HART2506	Commercial Refrigeration I.....	4
HART2510	Commercial Electrical and Controls.....	3
HART2526	Commercial Heating and HVAC Systems.....	3
HART2530	Commercial Load Calculating.....	2
HART2540	Internship - Commercial.....	2

Suggested Technical Studies Semester IV

HART2502	Commercial Refrigeration II.....	4
HART2514	Compressor Operation & Troubleshooting.....	3
HART2518	Commercial Troubleshooting	2

HART2522	Commercial Air Conditioning	3
HART2534	Commercial HVAC Controls.....	2

General Education

MNTC Goal Area 1 Communications-Oral	3
MNTC Goal Area 1 Communications-Written	3
MNTC Goal Area 4 Mathematics	3
MNTransfer General Education Electives	6

Estimated cost of books, supplies and materials: 2,605

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Heating Air Conditioning & Refrigeration

Heating Air Conditioning & Refrigeration Commercial Diploma (66 Credits)



Program Description

The Heating, Air Conditioning, and Refrigeration Technology Program prepares workers to enter the heating, ventilation, air conditioning, and refrigeration field. First year emphasizes residential service, maintenance, and installation of forced air furnaces, heat pumps, and air conditioning systems. Second year emphasizes commercial service, maintenance, and installation of heating, air conditioning, and refrigeration systems. Students will gain knowledge in troubleshooting of electrical controls, motors, service and maintenance of refrigeration, heating and air conditioning systems and equipment.

Well-trained service technicians are in great demand in this rapidly growing trade. Service, maintenance and proper installation are of great concern to the customer. Technicians trained in this field will perform preventive maintenance to keep systems operating efficiently and respond to service calls to perform repairs to systems as needed. Service technicians will work alone much of the time and use their training and knowledge to diagnose systems and perform needed repairs. The service technician must also have good customer relation skills.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Employment is available with heating, air conditioning, and refrigeration service companies; wholesale supply companies; maintenance positions at hospitals, schools, supermarkets, etc. Other positions include sales, installation, and design, and manufacturer representatives.

Suggested Technical Studies Semester I

HART1502	Copper and Gas Piping	1
HART1510	Sheetmetal.....	1
HART1514	Forced Air Heating	5
HART1518	Electrical Controls for Heating and A/C.....	4
HART1540	Internship - Residential.....	2

Suggested Technical Studies Semester II

HART1506	Schematics & Blue Print Reading	3
HART1522	Installation of Heating and A/C	3
HART1526	Principles of Air Conditioning.....	4
HART1530	Heat Pumps.....	2
HART1534	Troubleshooting Heating & A/C.....	3
HART1538	HART Job Preparation.....	1

Suggested Technical Studies Semester III

HART2506	Commercial Refrigeration I.....	4
HART2510	Commercial Electrical and Controls.....	3
HART2522	Commercial Heating and HVAC Systems	3
HART2530	Commercial Load Calculating.....	2
HART2540	Internship - Commercial	2

Suggested Technical Studies Semester IV

HART2502	Commercial Refrigeration II.....	4
HART2514	Compressor Operation & Troubleshooting.....	3
HART2518	Commercial Troubleshooting	2

HART2526	Commercial Air Conditioning	3
HART2534	Commercial HVAC Controls.....	2

General Studies

ENGL1100	Writing for the Workplace	3
GBEH1100	Human Relations	3
General Studies - Electives		3

Estimated cost of books, supplies and materials: 2,405

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Heating Air Conditioning & Refrigeration

Heating Air Conditioning & Refrigeration Residential Diploma (35 Credits)



Program Description

The Heating, Air Conditioning, and Refrigeration Technology Program prepares workers to enter the heating, ventilation, air conditioning, and refrigeration field. This diploma emphasizes residential service, maintenance, and installation of forced air furnaces, heat pumps, and air conditioning systems. Students will gain knowledge in troubleshooting of electrical controls, motors, service and maintenance of residential heating and air conditioning systems.

Well-trained service technicians are in great demand in this rapidly growing trade. Service, maintenance and proper installation are of great concern to the customer. Technicians trained in this field will perform preventive maintenance to keep systems operating efficiently and respond to service calls to perform repairs to systems as needed. Service technicians will work alone much of the time and use their training and knowledge to diagnose systems and perform needed repairs. The service technician must also have good customer relation skills.

The general studies courses are technically focused and not designed for transfer

Career Opportunities

Employment is available with heating, air conditioning, and refrigeration service companies; wholesale supply companies; maintenance positions at hospitals, schools, supermarkets, etc. Other positions include sales, installation, and design, and manufacturer representatives.

Suggested Technical Studies Semester I

HART1502	Copper and Gas Piping	1
HART1510	Sheetmetal.....	1
HART1514	Forced Air Heating	5
HART1518	Electrical Controls for Heating and A/C.....	4
HART1540	Internship - Residential.....	2

Suggested Technical Studies Semester II

HART1506	Schematics & Blue Print Reading	3
HART1522	Installation of Heating and A/C	3
HART1526	Principles of Air Conditioning	4
HART1530	Heat Pumps.....	2
HART1534	Troubleshooting Heating & A/C.....	3
HART1538	HART Job Preparation.....	1

General Studies

ENGL1100	Writing for the Workplace	3
GBEH1100	Human Relations	3

Estimated cost of books, supplies and materials: 2,185

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Information Technology Infrastructure

Network Administration AAS Degree (60 Credits)



Program Description

The Network Administration major reflects current Information Technology (IT) industry requirements, with a focus on certifications. Students learn theoretical knowledge and hands-on proficiency in a high-demand industry. General Education courses help to develop student interpersonal communications abilities and other important "soft skills" needed in the IT field. The capstone course includes comprehensive lab and internship experiences, exposing students to actual IT scenarios and work environments, providing them the opportunity to demonstrate their abilities in the presence of prospective employers.

Degree Specific Program Requirements: Students who have earned a grade of "C" or better, in all required classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the AAS degree.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Employment includes positions in IT Helpdesk, desktop and server assembly and configuration, systems upgrade and repair, user training, and more. The curriculum includes a strong combination of skills, which combined with very attainable certifications, results in excellent job placement potential.

Suggested Technical Studies Semester I

MSNA1214	Windows Desktop Operating Systems	3
MSNA1230	Introduction to Networks I.....	2
MSNA1235	Introduction to Virtualization.....	2
MSNA1240	Hardware Support.....	3

Suggested Technical Studies Semester II

BUSM1290	Job Seeking/Keeping Skills.....	1
MSNA1213	MS Server Infrastructure OS.....	3
MSNA1245	Software Support.....	2
MSNA1255	Introduction to Networks II.....	2
MSNA2211	Linux Server.....	3

Suggested Technical Studies Semester III

MSNA1205	Intro to Help Desk.....	3
MSNA1225	Cisco Routing & Switching Essentials.....	3
MSNA2201	MS Server AD Configuration.....	3
MSNA2245	IT Security Fundamentals.....	2

Suggested Technical Studies Semester IV

MSNA2215	MSNA Internship.....	2
MSNA2226	MSNA Capstone.....	2
MSNA2235	Cisco Routing & Switching - Scaling Networks.....	3
MSNA2260	MS Server Applications.....	3

Technical Electives

Choose from: CMSC1203,1212 BUSM2210	3
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General Education

CMST2302	Small Group Communication	3
CRTK1300	Introduction to Critical Thinking	3
MNTC Goal Area 1 Communications-Written	3	
MNTC Goal Area 1 Communications-Oral	3	
MNTC Goal Area 4 Mathematics and Logic (Excludes MATH1331).....	3	

Estimated cost of books, supplies and materials: 1,500

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Information Technology Infrastructure

PC Specialist Diploma (32 Credits)



Program Description

The PC Specialist diploma will train students, through theory and hands-on practice, in basic computer hardware, operating system, networking and application installation, configuration and use. The diploma can be used as a stand-alone course of study or as an opportunity for students to continue their education in the information technology field.

Technical courses include microcomputer hardware, software, networking and computer security, as well as application skills.

Degree Specific Program Requirements: Students who have earned a grade of "C" or better, in all technical classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the diploma.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Graduates of the PC Specialist major will be able to enter the job market as entry level help desk workers in the Information Technology field. PC Specialists will provide end users with basic hardware, operating system software and networking support, as well as application program use and troubleshooting.

Suggested Technical Studies Semester I

MSNA1205	Intro to Help Desk	3
MSNA1214	Windows Desktop Operating Systems	3
MSNA1230	Introduction to Networks I.....	2
MSNA1235	Introduction to Virtualization.....	2
MSNA1240	Hardware Support.....	3
MSNA2245	IT Security Fundamentals.....	2

Suggested Technical Studies Semester II

BUSM1290	Job Seeking/Keeping Skills	1
MSNA1213	MS Server Infrastructure OS	3
MSNA1245	Software Support	2
MSNA1255	Introduction to Networks II	2

Technical Electives

Choose from: CMSC1203,1212 BUSM2210, MSNA2201,2211... 3

General Education

ENGL1100	General Studies - Written Communication	3
GBEH1100	General Studies - Human Relations	3

Estimated cost of books, supplies and materials: 800

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Land Surveying/Civil Engineering

Land Surveying/Civil Engineering AAS Degree (70 Credits)



Program Description

The Land Surveying/Civil Engineering Program prepares individuals for employment as engineering/surveying technicians. Students learn surveying and drafting techniques, along with design and construction practices pertaining to sewer, water, streets, roads, and land surveying. Students are introduced to modern surveying equipment; computer applications; computer aided drafting and design, and surveying methods.

Technicians must be able to work with other professional people, as well as the general public on a day-to-day basis. Working conditions for technicians may involve a variety of indoor and/or outdoor settings. Problem solving and critical thinking skills are essential to this profession.

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons: national or international program certification, national or international standards including skill standards, standards recommended by a primary employer or multiple employers, national specialized program accreditation, state licensure requirements, and/or national practices or standards.

Degree Specific Program Requirements: Students who have earned a grade of "C" or better, in all technical classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the AAS degree.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Technicians may be employed by state, county and city governmental agencies, contractors, private engineering or land surveying firms in a wide range of starting positions. Civil Engineering design, boundary surveying, computer application, testing of materials, construction surveying and inspection, estimating and general design work are just a few examples of career possibilities.

Suggested Technical Studies Semester I

LSCE1510	Civil Drafting Methods.....	3
LSCE1518	Materials, Estimating, and Specifications.....	3
LSCE1530	Survey Fundamentals.....	5

Suggested Technical Studies Semester II

LSCE1502	Surveying Principles I.....	3
LSCE1506	Advanced Survey.....	5
LSCE1514	Civil CADD I.....	3
LSCE1527	Technical Computations II.....	3

Suggested Technical Studies Semester III

LSCE2502	Control and Digital Surveys	5
LSCE2514	Civil CADD II	3
LSCE2518	Utility Design I.....	3
LSCE2526	Subdivision Design.....	4

Suggested Technical Studies Semester IV

LSCE2506	Construction Design and Surveying Principles	5
LSCE2510	Surveying Principles II	3
LSCE2522	Civil CADD III.....	3
LSCE2530	Utility Design II.....	3

General Education

MATH1300	College Algebra	3
MATH1321	College Trigonometry.....	3

MNTC Goal Area 1 Communications-Oral	3
MNTC Goal Area 1 Communications-Written	4
MNTC Goal Area 2, 5, 6 or 7	3

Estimated cost of books, supplies and materials: 2,995

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Land Surveying/Civil Engineering

Land Surveying/Civil Engineering Diploma (63 Credits)



Program Description

The Land Surveying/Civil Engineering Program prepares individuals for employment as engineering/surveying technicians. Students learn surveying and drafting techniques, along with design and construction practices pertaining to sewer, water, streets, roads, and land surveying. Students are introduced to modern surveying equipment; computer applications; computer aided drafting and design, and surveying methods.

Technicians must be able to work with other professional people, as well as the general public on a day-to-day basis. Working conditions for technicians may involve a variety of indoor and/or outdoor settings. Problem solving and critical thinking skills are essential to this profession.

Degree Specific Program Requirements: Students who have earned a grade of "C" or better, in all technical classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the diploma.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Technicians may be employed by state, county and city governmental agencies, contractors, private engineering or land surveying firms in a wide range of starting positions. Civil Engineering design, boundary surveying, computer application, testing of materials, construction surveying and inspection, estimating and general design work are just a few examples of career possibilities.

Suggested Technical Studies Semester I

LSCE1510	Civil Drafting Methods.....	3
LSCE1518	Materials, Estimating, and Specifications.....	3
LSCE1530	Survey Fundamentals.....	5
TECH1545	Technical Computations	3

Suggested Technical Studies Semester II

LSCE1502	Surveying Principles I.....	3
LSCE1506	Advanced Survey.....	5
LSCE1514	Civil CADD I.....	3
LSCE1527	Technical Computations II.....	3

Suggested Technical Studies Semester III

LSCE2502	Control and Digital Surveys	5
LSCE2514	Civil CADD II	3
LSCE2518	Utility Design I	3
LSCE2526	Subdivision Design.....	4

Suggested Technical Studies Semester IV

LSCE2506	Construction Design and Surveying Principles	5
LSCE2510	Surveying Principles II	3
LSCE2522	Civil CADD III.....	3
LSCE2530	Utility Design II.....	3

General Education

General Studies ENGL 1100 or MNTC Goal Area 1.....	3
General Studies GBEH 1100 or MNTC Goal Area 5	3

Estimated cost of books, supplies and materials: 2,795

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Liberal Arts and Transfer

Biology Transfer Pathway AS Degree 60 Credits (Pending MinnState approval)



Program Description

The Biology Transfer Pathway AS degree offers students an opportunity to complete an associate degree that fully transfers to a Biology bachelor's degree program at any one of seven universities within the Minnesota State system* that offers the major. The entire curriculum has been carefully designed to meet designated bachelor's degree program requirements for transfer students planning initial study at one of the 30 community and technical colleges of Minnesota State that offers the pathway. Students planning to transfer outside of the Minnesota State system are advised to consult with their intended transfer institution to determine transferability of the courses in this curriculum.

* The Minnesota State universities are Bemidji State University; Metropolitan State University; Minnesota State University, Mankato; Minnesota State University Moorhead; St. Cloud State University; Southwest Minnesota State University; and Winona State University.

GENERAL REQUIREMENTS:

1. A minimum of 60 semester credits in courses numbered 1000 or above.
2. A minimum grade point average (GPA) of 2.0 at SCTCC in courses numbered 1000 or above.
3. A minimum of 20 semester credits applied toward the degree must be taken from SCTCC.
4. Completion of specific degree requirements below.

BIOLOGY TRANSFER PATHWAY REQUIREMENTS:

C or better grades will be applicable to the major

MNTC Goal 1 Communications:

ENGL 1302 Analytical Writing 4 Credits
AND

Choose one from:

CMST 1320 Intro to Communication Studies OR
CMST 2310 Interpersonal Communication 3 Credits

MNTC Goal 3 Natural Sciences:

Biology Requirements:

BLGY 1351 General Biology I..... 4 Credits
BLGY 1355 General Biology II 4 Credits
BLGY 2340 Genetics..... 4 Credits

Select One of the Following:

BLGY 2330 Microbiology..... 4 Credits
OR (Completed at another institution)
General Ecology with Lab 4 Credits
Cell Biology (upper division) with Lab 4 Credits

Chemistry Requirements:

CHEM 1350 General Chemistry I 4 Credits
CHEM 1355 General Chemistry II..... 4 Credits

MNTC Goal 4 Math Requirements:

Choose two courses from: MATH 1300, MATH 1321, MATH 1380, MATH 2310, MATH 2320 6 credits

MNTC Goal 5 Social, Behavior Sciences and History:

Choose one class 3 Credits

MNTC Goal 6 Humanities and Fine Arts

Choose one class 3 Credits

Elective Credits: 17 credits

These can be additional MNTC courses or other college level courses including specific program requirements. Please consult with your advisor for course selection. Useful elective credits within the sciences may include:

Geology, Calculus, Anatomy and Physiology, Organic Chemistry I and II, Physics, Environmental Science, and Statistics.

A total of 60 credits is required to complete the Biology Transfer Pathways AS degree.

Completion of the Biology Transfer Pathway AS degree does NOT fulfill requirements for the AA or MNTC

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Liberal Arts and Transfer

Coaching Certificate (15 Credits)



Program Description

The Coaching certificate is ideal for students planning a career as an educator, students planning to coach interscholastic sports, licensed high school teachers preparing for head coaching positions, and students seeking to develop a foundation for future coaching opportunities at any level. The Coaching certificate provides students with a background in coaching styles and methods. It also prepares students to deal with the mental aspect of coaching and sports. Prevention and care for athletic injuries, and treating athletic related emergencies is also covered. Specific coaching and training techniques for football, volleyball, basketball, baseball and softball are also included.

Career Opportunities

The Coaching certificate meets the requirements of the Minnesota State High School League and Minnesota Statute 122A.33, which dictates the minimum coaching education necessary to be a head coach at the high school level. Many youth sports organizations also recommend the coursework included in the Coaching certificate.

Required Technical Studies

HPER1315	Sports Related First Aid and CPR/AED	2
HPER1320	Prevention and Care of Athletic Injuries	2
HPER1325	Psychology of Sports and Coaching	3
HPER1330	Coaching Methods	3
HPER1360	Weight Training and Conditioning	1

Technical Electives, Choose 4 credits from:

HPER1335	Football Coaching Theory and Skills Improvement..	2
HPER1340	Volleyball Coaching Theory and Skills	2
HPER1345	Basketball Coaching Theory and Skills Improvement	2
HPER1355	Baseball Coaching Theory and Skills Improvement	2
HPER1365	Softball Coaching Theory and Skills Improvement .	2

Estimated cost of books, supplies and materials: 550

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Liberal Arts and Transfer

Liberal Arts and Sciences AA Degree (60 Credits)



Program Description

This degree constitutes the first two years of a baccalaureate degree at most colleges and universities anywhere in the world. The AA Degree provides students with a broad base of classes to help develop key communication and critical thinking skills and exposes students to new and diverse ideas. An Associate of Arts Degree is a stackable credential that students can use in a career or as a basis for further academic studies.

Minnesota Transfer Curriculum (MnTC)

This curriculum is designed for those students who intend on transferring to another college or university within the Minnesota State Colleges and Universities (MinnState) system and was designed to give students certainty on how their general education courses transfer within MinnState. The MnTC is the core of the Associate in Arts Degree and serves as the key to all undergraduate education at SCTCC and all MinnState institutions. The courses that students complete at SCTCC can help them earn a degree at any MinnState institution and are often transferable to other colleges and universities.

DEGREE SPECIFIC PROGRAM REQUIREMENTS:

1. A minimum of 60 semester credits in courses numbered 1000 or above.
2. A minimum grade point average (GPA) of 2.0 at SCTCC in courses numbered 1000 or above. Students who have transferred to SCTCC must have a minimum GPA of 2.0 in SCTCC courses and accepted transfer courses for the MnTC.
3. A minimum of 20 semester credits applied toward the degree must be taken from SCTCC.
4. Completion of specific degree requirements below.

A detailed planner for the Associate of Arts Degree can be found at:
www.sctcc.edu/aa-degree.

2017-18 AA Degree requirements:

Minnesota Transfer Curriculum (MnTC) Requirements - 40 credits in 10 goal areas

These two criteria must be met to complete the MnTC:

- All ten goal areas listed below must be completed.
- At least 40 semester credits from courses listed in the MnTC must be satisfactorily completed. One course may satisfy more than one goal area, but the course credits may be counted only once.

Goal 1 Communication Written

ENGL 1302 Analytical Writing (required) 4 Credits

OR

ENGL 1308 and 1309 Stretch Analytical Writing I & II

Goal 1 Communication ORAL 3 Credits

Choose from CMST 1320, 2300, 2302, 2310, 2315

Goal 2 Critical Thinking (one course)

CRTK 1300 Critical Thinking (required)..... 3

Goal 3 Natural Sciences (two courses from two different

subjects, one must be lab course) 7

Goal 4 Mathematical/Logical Reasoning (one course)..... 3

Goal 5 History and the Social and Behavior Sciences

(three courses from three different subjects)..... 9

Goal 6 The Humanities and Fine Arts (three courses from different subjects) 9

Goal 7 Human Diversity (two courses)

DVRS1304 required 6

Goal 8 Global Perspective (one course)..... 3

Goal 9 Ethical and Civic Responsibility (one course)..... 3

Goal 10 People and the Environment (one course).....3

Wellness Requirement..... 2
Choose from: BLGY 1325, HPER 1310, 1360, PSYC 1350

Elective Credits 18

(After completing the MNTC, the balance of the 60 semester credits for the degree may be met by taking college-level course-work appropriate to the student's transfer program).

For full MNTC course listings go to <http://www.sctcc.edu/prospective-students/programs-majors/mntransfer-courses>.

Estimated cost of books, supplies and materials:

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Liberal Arts and Transfer

Psychology Transfer Pathway AA Degree (60 Credits) (Pending MinnState approval)



Program Description

The Psychology Transfer Pathway AA degree offers students an opportunity to complete an associate degree that fully transfers to a Psychology bachelor's degree program at any one of seven universities within the Minnesota State system* that offers the major. The entire curriculum has been carefully designed to meet designated bachelor's degree program requirements for transfer students planning initial study at one of the 30 community and technical colleges of Minnesota State that offers the pathway. Students planning to transfer outside of the Minnesota State system are advised to consult with their intended transfer institution to determine transferability of the courses in this curriculum.

* The Minnesota State universities are Bemidji State University; Metropolitan State University; Minnesota State University, Mankato; Minnesota State University Moorhead; St. Cloud State University; Southwest Minnesota State University; and Winona State University.

GENERAL REQUIREMENTS:

1. A minimum of 60 semester credits in courses numbered 1000 or above.
2. A minimum grade point average (GPA) of 2.0 at SCTCC in courses numbered 1000 or above. Students who have transferred to SCTCC must have a minimum GPA of 2.0 in SCTCC courses and accepted transfer courses for the MnTC.
3. A minimum of 20 semester credits applied toward the degree must be taken from SCTCC.
4. Completion of specific degree requirements below.

Psychology Transfer Pathway Requirements

Completion of the Minnesota Transfer Curriculum (MnTC)

These criteria must be met to complete the MnTC:

- All ten goal areas listed in this planner must be completed. One course may satisfy more than one goal area, but the course credits may be counted only once.
- The transfer pathway may require specific courses in some goal areas.

Psychology Transfer Pathway Courses

Required Courses:

PSYC 1300 Intro to Psychology 3 Credits
PSYC 2330 Statistics for Psychology 4 Credits

Select One of the Following:

PSYC 1304 Lifespan Developmental
 Psychology 3 Credits
PSYC 2310 Abnormal Psychology 3 Credits
PSYC 2320 Social Psychology 3 Credits

Psychology Elective

May be a course from the list above or another

Psychology course 3 Credits

Math Requirement (Select one of the following)

MATH 1300 College Algebra 3 Credits
MATH 1350 Introduction to Statistics 3 Credits

AA Degree Wellness Requirement

Wellness Requirement..... 2 Credits
Choose from: BLGY 1325, HPER 1310, 1360, PSYC 1350

A total of 60 credits is required to complete the Psychology Transfer Pathways AA degree.

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Marketing and Design

Marketing and Design AAS Degree (64 Credits)



Program Description

The marketing and design student studies the various forms of communication mediums while developing the design skills and creative talent necessary to market ideas, concepts and products. This program covers all general marketing concepts including strategic planning, consumer buying behavior, account management, copywriting, e-marketing, public relations, advertising, branding, media planning, promotions, marketing research, along with team building, photography and basic graphic design.

Innovation, confidence, organizational skills, and strong leadership skills are developed throughout the curriculum with a substantial focus on communications – oral, written, and interpersonal. The marketing and design field is an exciting career choice with unlimited opportunity for creativity and job advancement. It’s estimated that more than one third of all Americans have marketing activities in their positions.

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons: national or international program certification, national or international standards including skill standards, standards recommended by a primary employer or multiple employers, national specialized program accreditation, state licensure requirements, and/or national practices or standards.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Employment opportunities exist within marketing firms, advertising agencies, newspapers, in-house advertising departments, social media companies, magazine publishers, radio and television stations, media research companies, direct marketing and outdoor advertising businesses.

Technical Studies Semester I

MKAD1200 Introduction to Advertising.....	3
MKAD1211 Adobe InDesign.....	3
MKAD1221 Adobe Photoshop.....	3
MKAD1230 Writing Copy That Sells.....	2
MKAD2240 The Northway Group.....	2

Technical Studies Semester II

MKAD1216 Adobe Illustrator.....	3
MKAD1265 Visual Design.....	3
MKAD1270 Media Research and Planning.....	3
MKAD2240 The Northway Group.....	2
SAMG1200 Principles of Marketing.....	3

Technical Studies Semester III

MKAD2240 The Northway Group.....	2
MKAD2260 Strategic Brand Communications Campaign.....	4
SAMG1221 Branding and Promotion.....	3

Technical Studies Semester IV

MKAD2250 Retail Advertising.....	3
MKAD2275 Social Media and Digital Marketing.....	3
MKAD2290 Portfolio Practicum.....	3
ADWD1235 Web Design Fundamentals.....	3

General Education

ART1340 Digital Photography.....	4
MNTC Goal Area 1 Communications - Oral.....	3
MNTC Goal Area 1 Communications - Written.....	3
MNTC Goal Area 5 or 9 Social, Behavior Sciences or Ethical/Civic Responsibility.....	3
MNTransfer General Education Electives.....	3

Estimated cost of books, supplies and materials: 1,458

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Marketing and Design

Marketing and Design Diploma (33 Credits)



Program Description

The marketing and design diploma student studies the various forms of communication mediums while developing design skills and creative talent. This program covers basic general marketing concepts including copywriting, advertising, media planning, along with team building, and basic graphic design.

The marketing and design field is an exciting career choice with unlimited opportunity for creativity and job advancement. It's estimated that more than one third of all Americans have marketing activities in their positions.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

This program prepares students for entry level positions in the advertising field.

Technical Studies Semester I

MKAD1200 Introduction to Advertising.....	3
MKAD1211 Adobe InDesign.....	3
MKAD1221 Adobe Photoshop.....	3
MKAD1230 Writing Copy that Sells.....	2
MKAD2240 The Northway Group.....	2

Technical Studies Semester II

MKAD1216 Adobe Illustrator.....	3
MKAD1265 Visual Design.....	3
MKAD1270 Media Research and Planning	3
MKAD2240 The Northway Group.....	2
SAMG1200 Principles of Marketing	3

General Education

MNTC Goal Area 1 Communications - Oral	3
MNTC Goal Area 1 Communications - Written	3

Estimated cost of books, supplies and materials: 1,458

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Medium/Heavy Truck Technician

Medium/Heavy Truck Technician AAS Degree (72 Credits)



Program Description

The Medium/Heavy Truck Technician Program is designed to provide individuals with the knowledge and skills needed for an entry-level technician position in the trucking industry. Students perform maintenance, repair, and overhaul on medium/heavy duty trucks and tractor/trailer vehicles in this program. Students develop and practice their skills in a well-equipped shop and study challenging areas, such as truck computers, diesel engines, electrical systems, suspension, air-brakes, and power-train. Students also explore welding, transport refrigeration, automatic transmissions, and truck body repair.

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons: national or international program certification, national or international standards including skill standards, standards recommended by a primary employer or multiple employers, national specialized program accreditation, state licensure requirements, and/or national practices or standards.

Accreditation Information: The Medium/Heavy Truck program is certified by the National Automotive Technicians Education Foundation, Inc. (NATEF), 101 Blue Seal Drive, Suite 101, Leesburg, VA 20175, (703) 669-6650, www.natef.org. The Medium Heavy Truck Technician Program is ASE Certified and graduates are prepared for the Automotive Service Excellence examinations.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Upon graduation, medium/heavy truck technicians may wish to specialize in one phase of the field, such as component rebuilding, transport refrigeration, or preventive maintenance. There are also opportunities for AAS Degree graduates as medium/heavy truck technicians, shop supervisors, dealer and factory representatives.

Suggested Technical Studies Semester I

MHTT1507	Mobile Hydraulics	3
MHTT1522	Truck Electrical Systems	2
MHTT1526	Truck and Trailer Preventative Maintenance.....	3
TRAN1502	General Service.....	2
TRAN1504	Electricity and Electronic Principles	3
TRAN1518	Transportation Hazardous Materials.....	1

Suggested Technical Studies Semester II

MHTT1503	Diesel Engine Fundamentals	3
MHTT1508	Truck Computer Systems.....	2
MHTT1514	Truck Brake Systems	4
MHTT1518	Truck Steering/Suspension	3
TRAN1520	Workplace Perceptions and Expectations	2

Suggested Technical Studies Semester III

MHTT1510	Truck Power Train	4
MHTT1530	Welding OR	
MHTT2514	Gas Engines and Alternative Fuel Systems	3
MHTT2502	Heavy Duty Diesel Engine Repair Procedures.....	4
MHTT2518	Automatic and Automated Manual Transmissions... ..	3
TRAN2514	Basic Air Conditioning	2

Suggested Technical Studies Semester IV

MHTT2506	Diesel III	4
MHTT2522	Electrical III	3

MHTT2530	Truck Heating and AC Systems.....	2
MHTT2546	Truck Preventive Maintenance and Troubleshooting	4

General Education

MNTC Goal Area 1 Communications-Written	3
MNTC Goal Area 1 Communications-Oral	3
MNTC Goal 2 - Critical Thinking	3
MNTC Goals 3 through 10	6

Estimated cost of books, supplies and materials: 5,186

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Medium/Heavy Truck Technician

Medium/Heavy Truck Technician Diploma (63 Credits)



Program Description

The Medium/Heavy Truck Technician Program is designed to provide individuals with the knowledge and skills needed for an entry-level technician position in the trucking industry. Students perform maintenance, repair, and overhaul on medium/heavy duty trucks and tractor/trailer vehicles in this program. Students develop and practice their skills in a well-equipped shop and study challenging areas, such as truck computers, diesel engines, electrical systems, suspension, air-brakes, and power-train. Students also explore welding, transport refrigeration, automatic transmissions, and truck body repair.

Accreditation Information: The Medium/Heavy Truck program is certified by the National Automotive Technicians Education Foundation, Inc. (NATEF), 101 Blue Seal Drive, Suite 101, Leesburg, VA 20175, (703) 669-6650, www.natef.org. The Medium Heavy Truck Technician Program is ASE Certified and graduates are prepared for the Automotive Service Excellence examinations.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Upon graduation, medium/heavy truck technicians may wish to specialize in one phase of the field, such as component rebuilding, transport refrigeration, or preventive maintenance.

Suggested Technical Studies Semester I

MHTT1507	Mobile Hydraulics	3
MHTT1522	Truck Electrical Systems	2
MHTT1526	Truck and Trailer Preventative Maintenance.....	3
TRAN1502	General Service.....	2
TRAN1504	Electricity and Electronic Principles	3
TRAN1518	Transportation Hazardous Materials.....	1

Suggested Technical Studies Semester II

MHTT1503	Diesel Engine Fundamentals	3
MHTT1508	Truck Computer Systems.....	2
MHTT1514	Truck Brake Systems	4
MHTT1518	Truck Steering/Suspension	3
TRAN1520	Workplace Perceptions and Expectations	2

Suggested Technical Studies Semester III

MHTT1510	Truck Power Train	4
MHTT2502	Heavy Duty Diesel Engine Repair Procedures	4
MHTT2518	Automatic and Automated Manual Transmissions...	3
TRAN2514	Basic Air Conditioning	2
MHTT1530	Welding OR	
MHTT2514	Gas Engines and Alternative Fuels	3

Suggested Technical Studies Semester IV

MHTT2506	Diesel III	4
MHTT2522	Electrical III	3

MHTT2530	Truck Heating and AC Systems.....	2
MHTT2546	Truck Preventive Maintenance and Troubleshooting	4

General Studies

General Studies Communications-Written	3
General Studies Electives	3

Estimated cost of books, supplies and materials: 4,926

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Nursing (A.D.N)

Nursing - LPN To ADN Mobility AS Degree (64 Credits)



Program Description

This program is designed for graduates from Practical Nursing programs. The nursing program includes a focus on Gerontology as healthcare practitioners are serving a growing population of patients with longer life expectancy. Supervised clinical experience is provided in hospital departments such as pediatrics, mental health, maternity, and surgery. Clinical experiences also include rural and community hospital settings, specialized dementia care facilities, and ambulatory clinics. Graduates are eligible to articulate to BSN/BAN programs in the MinnState system as part of the MinnState Nursing Articulation Agreement.

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons: national or international program certification, national or international standards including skill standards, standards recommended by a primary employer or multiple employers, national specialized program accreditation, state licensure requirements, and/or national practices or standards.

Degree Specific Program Requirements: A background check, including fingerprinting, will be completed as a requirement of this program. At the time of the background check submission, students must provide documentation as required by the MN Department of Human Services. If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study, or on your ability to obtain federal, state, and other higher education financial aid. Students who have earned a grade of "C" or better, in all required classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the AS degree. Students will receive 9 credits for their PN education and must be currently licensed as an LPN at the time of application. Students must also complete the required 31 General Education credits and 24 Professional Nursing credits to receive a Nursing, RN AS degree for a total of 64 credits.

Accreditation Information: The Nursing A.D.N. Program is approved by the Minnesota State Board of Nursing, 2829 University Ave SE, 2nd Floor, Minneapolis, MN 55414-3253, (612) 617-2270 or (888) 234-2690, <http://mn.gov/boards/nursing>. Graduates of this program are eligible to apply to take the National Council Licensure Examination (NCLEX-RN), which is required for practice as a Registered Nurse.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

A nursing career enables a graduate to help where help is greatly needed. The big demand can also translate into registered nursing jobs with enticing perks and attractive nursing salaries for skilled and qualified applicants.

Technical Studies Pre-requisites:

BLGY2310	Human Anatomy/Physiology I	4
BLGY2320	Human Anatomy/Physiology II	4
BLGY2330	Microbiology	4
CMST2310	Interpersonal Communication OR	
CMST1320	Introduction to Communication Studies	3
ENGL1302	Analytical Writing	4
PHIL1320	Ethics	3
PSYC1304	Life Span Developmental Psychology.....	3
BLGY1325	Nutrition.....	3
GERO1300	Introduction to Gerontology	3
	Practical Nursing Credits granted for advanced standing	9

* A minimum grade of "C" of better and a cumulative GPA of 3.0 or above in all Acceptance coursework is required to be considered for admission and must be maintained. LPN Credits granted for advanced standing

*THE FOLLOWING LICENSE/REGISTRATIONS MUST BE CURRENT AND ON FILE PRIOR TO ADMISSION INTO THE PROGRAM -- CPR/AED - Adult, Child & Infant (Health Care Provider Level)--Minn. Board of Nursing LPN License

Technical Studies Semester I

NURS2401	Transitional Nursing Concepts	3
NURS2415	Nursing Concepts I	5
NURS2418	Clinical Concepts I	4

Technical Studies Semester II

NURS2411	Professional Nursing Concepts	3
NURS2421	Nursing Concepts II	5
NURS2424	Clinical Concepts II	4

Estimated cost of books, supplies and materials: 2,420

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Office Administration

Office Administration AAS Degree (60 Credits)



Program Description

The Office Administration AAS Degree prepares a graduate for a variety of administrative and clerical support functions. The program consists of core administrative courses designed to develop basic office skills, including keyboarding, oral and written communications, business math skills (10-key), customer service, and computer operations.

Office Administration AAS Degree graduates successfully complete internships in a variety of general, legal, medical, educational, and governmental offices. Internship sites serve as potential employment and references. Graduates are employed in a variety of firms and organizations.

Degree specific requirements: All students are required to purchase a program-specific laptop.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Administrative support is needed in all job sectors: business, education, government, health, manufacturing, and more.

Suggested Technical Studies Semester I

ACCT1215	Accounting Principles I	4
ADMS1203	Microsoft Software in Business I	3
ADMS1207	Administrative Office Procedures	3
BUSM1267	Introduction to Business	2
SAMG1206	Strategic Customer Service	3

Suggested Technical Studies Semester II

ADMS1204	Microsoft Software in Business II	3
ADMS1208	Administrative Support Applications	3
BUSM2275	Legal Environment of Business	3
SAMG1215	Principles of Management	3

Technical Electives - Choose 15 Credits From:

ACCT1216	Accounting Principles II	4
ACCT1217	Cost Accounting	4
ACCT1225	QuickBooks	3
ACCT2229	Managerial Accounting	4
BUSM1260	Applied Business Mathematics/Calculators	3
BUSM1290	Job Seeking/Keeping Skills	1
BUSM2210	Project Management	3
CMSC1203	Structured Programming Logic	3
CMSC1206	Basic Networking/ Security	3
CMSC1216	Database Modeling I	3
CMSC1217	Data Analytics	3
HITM1215	Health Information Foundations	3
HITM1225	Introduction to Health Information Technology	3
HITM1228	Administrative Medical Terminology	3
HITM1240	Computerized Health Information	3
LEGL1203	Legal Research and Writing	4
LEGL1206	Paralegal Basic Law I	3
LEGL1210	Ethics for Legal Professionals	2
LEGL1215	Paralegal Basic Law II	3
MKAD2275	Social Media and Digital Marketing	3
MSNA1214	Windows Desktop Operating Systems	3
MSNA1230	Introduction to Networks I	2

MSNA1240	Hardware Support	3
MSNA1245	Software Support	2
SAMG1200	Principles of Marketing	3
SAMG1211	Professional Sales Fundamentals	3
SAMG1215	Principles of Management	3
SAMG2270	Managing Human Resources	3
SAMG2280	Sales Force Management	3

Technical Studies - Internship

ADMS2211	Administrative Support AAS Internship	3
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General Education

ENGL1303	Technical Writing	3
MNTC Goal Area 1	Communications-Oral	3
MNTC Goal Area 2	Critical Thinking	3
MNTC Goal Area 7	Diversity	3
MNTC Goal Area 9	Ethic and Civic Responsibility	3

Estimated cost of books, supplies and materials: 3,600

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Paramedicine

Community Paramedic Certificate (13 Credits)



Program Description

The program will provide paramedics with education and training to expand their emergency medical services to more broadly serve communities in the areas of primary care, public health, disease management, prevention and wellness, mental health and oral health. The Community Paramedic program incorporates theoretical knowledge with extensive clinical application and experience. This training provides students with the opportunity to enter the field with the skills and knowledge to guide patients in their overall health needs.

Accreditation:

The Community Paramedic is approved by the State of Minnesota Emergency Medical Service Board (EMSRB), 2829 University Ave SE, Suite 310, Minneapolis, MN 55414, (651) 201-2800, Fax: (651) 201-2812, <https://mn.gov/boards/emsrb> . Graduates will be eligible for certification by EMSRB and the national certification exam (CP-C).

Degree Specific Program Requirements: Current certified Paramedics will be eligible to enroll in the Community Paramedic Program; two years of full time experience as a Paramedic will be required upon completion of this program. A background check, including fingerprinting, will be completed as a requirement of this program. At the time of the background check submission, students must provide documentation as required by the MN Department of Human Services. If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study, or on your ability to obtain federal, state, and other higher education financial aid.. Students who have earned a grade of "C" or better, in all required classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the certificate.

Career Opportunities

Career opportunities for Community Paramedics include: private ambulance services, hospitals, industry, and city health agencies. Some of the roles include Community Paramedic, Care Coordinator, and Paramedic.

Required Technical Studies

IHCP2010	Community Based Needs & Strategies for Care	3
IHCP2015	The Role of the Community Paramedic in the Continuum of Care.....	3
IHCP2020	Community Assessment, Resources, & Interaction..	3
IHCP2025	Community Paramedic Internship	4

Estimated cost of books, supplies and materials: 700

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Paramedicine

Paramedicine AAS Degree (64 Credits)



Program Description

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons: national or international program certification, national or international standards including skill standards, standards recommended by a primary employer or multiple employers, national specialized program accreditation, state licensure requirements, and/or national practices or standards.

Degree Specific Program Requirements: All Paramedicine students are required to have an iPad and required software. A background check, including fingerprinting, will be completed as a requirement of this program. At the time of the background check submission, students must provide documentation as required by the MN Department of Human Services. If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study, or on your ability to obtain federal, state, and other higher education financial aid. Students who have earned a grade of "C" or better, in all required classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the AAS degree.

Accreditation Information: The Paramedicine program is accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP), 1361 Park Street, Clearwater, FL 33756, (727) 210-2350, Fax: (727) 210-2350, <http://www.caahep.org>. Committee on Accreditation of Educational Programs for EMS Professions (CoAEMSP), Suite 111-312, 8301 Lakeview Parkway, Rowlett, TX 75088, (214) 703-8992, www.coaemsp.org and MN Emergency Medical Services Regulatory Board (EMSRB), 2829 University Ave SE, Suite 310, Minneapolis, MN 55414, (651) 201-2800, Fax: (651) 201-2812, www.mn.gov/boards/emsrb.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Career opportunities for paramedics include: private ambulance companies, hospitals, industry, city health agencies, fire departments and law enforcement agencies. Park services, ski patrols and other groups in many countries often educate their personnel to become Emergency Medical Technicians or Paramedics as part of their duties.

Technical Studies Pre-requisites:

HLTH1440	Medical Terminology.....	1
BLGY1321	Human Biology.....	4

*AHA CPR for Healthcare Provider and EMT Basic are also required before beginning the Paramedicine program. (must submit AHA CPR and MN EMSRB EMT-B card)

*In addition the following must be completed: A medical examination, vaccinations against Hepatitis B or signed release form, Mantoux test, mandatory attendance at an informational meeting and background check.

Suggested Technical Studies Semester I

EMSP1401	EMS Operations.....	3
EMSP1402	Paramedicine Skills I.....	3
EMSP1403	Introduction to Pharmacology	1
EMSP1405	Medical Emergencies.....	3

Suggested Technical Studies Semester II

EMSP1404	Emergency Pharmacology for Paramedics.....	2
EMSP1407	Cardiology I.....	2
EMSP1410	Cardiology II.....	4
EMSP1432	Support Services Internship.....	2

Suggested Technical Studies Semester III (Summer)

EMSP1409	Paramedicine Skills II.....	2
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EMSP1441	ALS Ambulance Internship	2
EMSP2438	Emergency Department Internship.....	3

Suggested Technical Studies Semester IV

EMSP2412	Paramedicine Skills III	2
EMSP2420	Specialized Populations	2
EMSP2425	Advanced Trauma Care	2
EMSP2430	ALS Ambulance Internship II.....	2
EMSP2435	Critical Care Internship.....	2

Suggested Technical Studies Semester V

EMSP2442	Acute Care Internship	2
EMSP2481	Paramedicine Internship	6
EMSP2485	Paramedicine Skills IV	2

General Education

CMST1320	Intro to Communication Studies	3
CRTK1300	Critical Thinking	3
PSYC1304	Lifespan Developmental Psychology	3
MNTC	Goal Area 1 Communications-Written	3

Estimated cost of books, supplies and materials: 1,905

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Plumbing

Plumbing, Shop Management AAS Degree (60 Credits)



Program Description

The Plumbing Program is designed to give students a series of experiences with a wide variety of tasks normally performed by a plumber. Some areas included are installation of fixtures, pipe threading, use of tools and equipment, hot and cold water supply, drainage systems, fabrication and testing, maintenance and repair of plumbing, and hydronic heating. Students choosing an AAS degree will find added emphasis on shop management and communication skills.

Related material covered includes blueprint reading and sketching, plumbers' mathematics, the Minnesota State Plumbing Code, and a considerable amount of trade knowledge. The building construction industry is moving ahead rapidly and becoming more complex each year. There is a need for people with the desire and ambition to learn the basics of plumbing and enter the field as apprentices.

Plumbers must keep informed on the latest developments in sanitary science. They contribute to the public health and welfare by means of well-designed and properly installed plumbing.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

The plumbing industry presents many outstanding opportunities for advancement and success in residential, commercial, industrial and service plumbing.

Suggested Technical Studies Semester I

PLBG1504	Piping Procedures I.....	5
PLBG1508	Plumbing Calculations I.....	4
PLBG1510	Minnesota State Plumbing Code I.....	3
PLBG1518	Blueprint Reading and Estimating I.....	4

Suggested Technical Studies Semester II

PLBG1514	Minnesota State Plumbing Code II.....	3
PLBG1520	Blueprint Reading and Estimating II.....	3
PLBG1524	Plumbing Calculations II.....	3
PLBG1530	Piping Procedures II.....	3
PLBG1538	Plumbing Internship.....	2
PLBG1544	Career Planning/Customer Relations.....	1

Technical Electives

Technical Electives	9
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General Education

CMST1320	Intro to Communication Studies	3
ENGL1302	Analytical Writing	4
MNTC Goal Area 6	Humanities	3
MNTC Goal Area 4	Mathematics and Logic	3
MNTC Goal Area 5	Social Sciences	3
MNTransfer	General Education Electives	4

Estimated cost of books, supplies and materials: 1,710

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Plumbing

Plumbing Diploma (37 Credits)



Program Description

The Plumbing Program is designed to give students a series of experiences with a wide variety of tasks normally performed by a plumber. Some areas included are installation of fixtures, pipe threading, use of tools and equipment, hot and cold water supply, drainage systems, fabrication and testing, maintenance and repair of plumbing, and hydronic heating.

Related material covered includes blueprint reading and sketching, plumbers' mathematics, the Minnesota State Plumbing Code, and a considerable amount of trade knowledge. The building construction industry is moving ahead rapidly and becoming more complex each year. There is a need for people with the desire and ambition to learn the basics of plumbing and enter the field as apprentices.

Plumbers must keep informed on the latest developments in sanitary science. They contribute to the public health and welfare by means of well-designed and properly installed plumbing.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

The plumbing industry presents many outstanding opportunities for advancement and success in residential, commercial, industrial and service plumbing.

Suggested Technical Studies Semester I

PLBG1504	Piping Procedures I.....	5
PLBG1508	Plumbing Calculations I	4
PLBG1510	Minnesota State Plumbing Code I.....	3
PLBG1518	Blueprint Reading and Estimating I	4

Suggested Technical Studies Semester II

PLBG1514	Minnesota State Plumbing Code II.....	3
PLBG1520	Blueprint Reading and Estimating II	3
PLBG1524	Plumbing Calculations II	3
PLBG1530	Piping Procedures II	3
PLBG1538	Plumbing Internship.....	2
PLBG1544	Career Planning/Customer Relations.....	1

General Studies

GBEH1100	Human Relations	3
General Studies - Electives	3

Estimated cost of books, supplies and materials: 1,240

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Practical Nursing

Practical Nursing Diploma (40 Credits)



Program Description

Practical Nursing is a challenging, meaningful, and fulfilling career with the benefits of intellectual stimulation, attractive earning potential, and personal rewards. The program is designed to prepare interested men and women to provide nursing care in a variety of patient care settings. The focus of the provision of care includes promotion of health, prevention of illness, holistic and restorative interventions, and acute and long-term care practice.

Degree Specific Program Requirements: A background check, including fingerprinting, will be completed as a requirement of this program. At the time of the background check submission, students must provide documentation as required by the MN Department of Human Services. If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study, or on your ability to obtain federal, state, and other higher education financial aid. Students who have earned a grade of "C" or better, in all required classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the diploma. All required practical nursing, PRSG prefix, courses must be completed at SCTCC. The program exists to educate and prepare individuals to complete the National Council Licensure Exam (NCLEX-PN).

Accreditation Information: The Practical Nursing Program is approved by the Minnesota State Board of Nursing, 2829 University Ave SE, 2nd Floor, Minneapolis, MN 55414-3253, (612) 617-2270 or (888) 234-2690, <http://mn.gov/boards/nursing> accredited by the Higher Learning Commission, and is accredited by the Accreditation Commission for Education in Nursing (ACEN), 3343 Peachtree Road NE, Suite 850, Atlanta, GA 30326, (404) 975-5000, www.acenursing.org.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

There are many choices for employment for Practical Nursing graduates including hospitals, nursing homes, medical offices, and home health care. LPNs may be hired as private nurses. Many health insurance companies are hiring LPNs to answer patients' questions concerning health needs. The Practical Nursing program provides an educational foundation for career mobility to associate or baccalaureate RN programs.

Technical Studies Prerequisites

HLTH1440	Medical Terminology.....	1
BLGY1321	Human Biology.....	4
PSYC1304	Life Span Developmental Psychology.....	3
MNTC Goal Area 1 - Written Communication	3
(ENGL1302 Analytical Writing is required for A.D.N.)		

*Current CPR/AED Adult, Child & Infant (Health Care Provider level) AND HLTH1402 Nursing Assistant or verification of completion of a 75 hours NA course.

* Applicant may only apply after successful completion of prerequisite requirements. These courses must be completed prior to starting the program. In addition, students must have completed the Accuplacer with scores above the cutoff points for Practical Nursing or successful completion of equivalent course work.

* A minimum grade of "C" or better and a cumulative GPA of 2.5 or above in prerequisite coursework is required to be considered for admission and must be maintained.

Technical Studies Semester I

PRSG2401	Medical Surgical Nursing I.....	3
PRSG2409	Basic Nursing Concepts.....	3
PRSG2419	Nursing Skills	3
PRSG2429	Essentials of Clinical Pharmacology	2
PRSG2439	Clinical Application I.....	3

Technical Studies Semester II

PRSG2402	Medical Surgical Nursing II	3
PRSG2411	Bridging to Nursing Practice	2
PRSG2440	Clinical Application II	5
PRSG2450	Maternal Child Nursing	3
PRSG2460	Mental Health Nursing	2

Estimated cost of books, supplies and materials: 1,740

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Sales, Management, Marketing

Sales, Management, Marketing AAS Degree (60 Credits)



Program Description

This degree program is designed for students who want to start their career in sales, management or marketing. The program introduces students to a broad base of sales, marketing and management related knowledge and includes experiences and opportunities for students to network and make connections in the community while they attend classes.

Students develop skills in business applications, including communication, sales, prospecting, marketing, customer relationship management, managing a business, supervising employees, and related technology applications. Courses emphasize practical business related knowledge and hands-on learning. During the program, students complete internship experiences that directly apply classroom learning to the workplace. This work experience broadens student's knowledge and helps them successfully secure positions after graduation.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Sales, Management, Marketing AAS graduates are often employed as department managers, store managers, retail sales associates, hospitality managers, customer service representatives, supervisors, business-to-business salespeople, and business owners. Graduates work in the areas of wholesale, industrial, and commercial sales, management, or marketing.

Suggested Technical Studies Semester I

BUSM1260	Applied Business Mathematics/Calculators	3
SAMG1200	Principles of Marketing	3
SAMG1206	Strategic Customer Service.....	3
SAMG1215	Principles of Management	3
SAMG1236	Professional Development.....	2

Suggested Technical Studies Semester II

CPTR1210	Introduction to Computers.....	3
SAMG1211	Professional Sales Fundamentals.....	3
SAMG1221	Branding and Promotion.....	3
SAMG1241	Internship I.....	2
SAMG1251	Financial Strategies for Business.....	3

Suggested Technical Studies Semester III

SAMG2245	Marketing Strategies.....	3
SAMG2255	Professional Sales Strategies	3
SAMG2266	Internship II	2

Suggested Technical Studies Semester IV

SAMG2270	Managing Human Resources.....	3
SAMG2280	Sales Force Management.....	3
SAMG2285	Entrepreneurship.....	3

General Education

MNTC Goal Area 1 Communications - Oral	3
MNTC Goal Area 1 Communications - Written	3
MNTC Goal Area 5 Social/Behavioral Sciences	3
MNTC Goal Area 2 or 6 Critical Thinking/Humanities	3
MNTransfer General Education Electives	3

Estimated cost of books, supplies and materials: 2,757

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Sales, Management, Marketing

Sales, Management, Marketing Associate Diploma (31 Credits)



Program Description

The diploma program is designed for students who want to start their career in sales, management or marketing and want to enter this dynamic, rapidly growing field. The program introduces students to a broad base of business related knowledge and includes experiences and opportunities for students to network and make connections in the community while they attend classes.

Students develop skills in business applications, including communication, sales, prospecting, marketing, customer relationship management, managing a business, supervising employees, and related technology applications. Courses emphasize practical business related knowledge and hands-on learning. During the program, students complete an internship experiences that directly apply classroom learning to the workplace. This work experience broadens students' knowledge and helps them successfully secure positions after graduation.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Sales, Management, Marketing graduates are often employed as department managers, store managers, retail sales associates, hospitality managers, customer service representatives, supervisors, business-to-business salespeople, and entrepreneurs. Graduates work in the areas of marketing, management, or wholesale, industrial and commercial sales.

Suggested Technical Studies Semester I

BUSM1260	Applied Business Mathematics/Calculators	3
SAMG1200	Principles of Marketing	3
SAMG1206	Strategic Customer Service.....	3
SAMG1215	Principles of Management	3
SAMG1236	Professional Development.....	2

Suggested Technical Studies Semester II

CPTR1210	Introduction to Computers.....	3
SAMG1211	Professional Sales Fundamentals.....	3
SAMG1241	Internship I.....	2
SAMG1251	Financial Strategies for Business.....	3

General Education

ENGL1100	General Studies - Written Communication	3
GBEH1100	General Studies - Human Relations	3

Estimated cost of books, supplies and materials: 1,835

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Sales, Management, Marketing

Sales, Management, Marketing Diploma (51 Credits)



Program Description

The diploma program is designed for students who want to start their career in sales, management or marketing and want to enter this dynamic, rapidly growing field. The program introduces students to a broad base of business related knowledge and includes experiences and opportunities for students to network and make connections in the community while they attend classes.

Students develop skills in business applications, including communication, sales, prospecting, marketing, customer relationship management, managing a business, supervising employees, and related technology applications. Courses emphasize practical business related knowledge and hands-on learning. During the program, students complete two internship experiences that directly apply classroom learning to the workplace. This work experience broadens students' knowledge and helps them successfully secure positions after graduation.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Sales, Management, Marketing graduates are often employed as department managers, store managers, retail sales associates, hospitality managers, customer service representatives, supervisors, business-to-business salespeople, and entrepreneurs. Graduates work in the areas of marketing, management, or wholesale, industrial and commercial sales.

Suggested Technical Studies Semester I

BUSM1260	Applied Business Mathematics/Calculators	3
SAMG1200	Principles of Marketing	3
SAMG1206	Strategic Customer Service.....	3
SAMG1215	Principles of Management	3
SAMG1236	Professional Development.....	2

Suggested Technical Studies Semester II

CPTR1210	Introduction to Computers.....	3
SAMG1211	Professional Sales Fundamentals.....	3
SAMG1221	Branding and Promotion.....	3
SAMG1241	Internship I.....	2
SAMG1251	Financial Strategies for Business.....	3

Suggested Technical Studies Semester III

SAMG2245	Marketing Strategies.....	3
SAMG2255	Professional Sales Strategies	3
SAMG2266	Internship II	2

Suggested Technical Studies Semester IV

SAMG2270	Managing Human Resources.....	3
SAMG2280	Sales Force Management.....	3
SAMG2285	Entrepreneurship.....	3

General Education

ENGL1100	General Studies - Written Communications	3
GBEH1100	General Studies - Human Relations.....	3

Estimated cost of books, supplies and materials: 2,722

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Sonography

Diagnostic Medical Sonography-Generalist (64 Credits)



Program Description

The Sonography Program provides students with academic study, laboratory and clinical experience in diagnostic medical sonography. Students receive comprehensive training and experience performing scanning procedures in abdominal, superficial structures, gynecological, obstetrical, and vascular ultrasound. Students are affiliated with health-care facilities during the clinical ultrasound internship courses. Diagnostic Medical Sonographers perform and analyze ultrasound images through the use of high frequency sound waves in a variety of medical settings.

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons: national or international program certification, national or international standards including skill standards, standards recommended by a primary employer or multiple employers, national specialized program accreditation, state licensure requirements, and/or national practices or standards.

Degree Specific Program requirements: A background check, including fingerprinting, will be completed as a requirement of this program. At the time of the background check submission, students must provide documentation as required by the MN Department of Human Services. If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study, or on your ability to obtain federal, state, and other higher education financial aid. Students who have earned a grade of "C" or better, in all required classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the AAS degree.

Accreditation Information: This program is nationally accredited by the Commission on Accreditation of Allied Health Educational Programs (CAAHEP), 1361 Park Street, Clearwater, FL 33756, (727) 210-2350, Fax: (727) 210-2350, <http://www.caahep.org> and by Joint Review Committee in Diagnostic Medical Sonography, 6021 University Blvd., Suite 500, Ellicott City, MO 21043, (443) 973-3257, Fax: (866) 738-3444, www.jrcdms.org. Upon completion of the program, graduates are eligible to take the national registry exams in Ultrasound Physics, Abdominal Ultrasound, and Obstetrical and Gynecological Ultrasound following American Registry for Diagnostic Medical Sonography (ARDMS) prerequisite guidelines.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Upon completion of the program, graduates are eligible to take the national registry exams in Ultrasound Physics, Abdominal Ultrasound, and Obstetrical and Gynecological Ultrasound following American Registry for Diagnostic Medical Sonography (ARDMS) prerequisite guidelines. Graduates of this program will be able to obtain, review and integrate pertinent and supporting clinical data to facilitate optimum diagnostic results, analyze and process anatomic, pathologic and/or physiologic data for interpretation by a physician.

Technical Studies Pre-requisites:

HLTH1440	Medical Terminology.....	1
BLGY2310	Human Anatomy/Physiology I.....	4
BLGY2320	Human Anatomy/Physiology II.....	4
PHYS1305	Conceptual Physics.....	4
MATH1300	College Algebra.....	3
MNTC Goal Area 1 Written (ENGL 1302 recommended).....		4
MNTC Goal Area 1 Oral (CMST2300 recommended).....		3

* Applicants may only apply to the Sonography program after successful completion of the acceptance requirements.

*Current Healthcare Provider certificate, CPR/AED required before beginning the Sonography program. Students are required to maintain this certificate throughout the program.

Suggested Technical Studies Semester I

DMSG1401	Introduction to the Sonography Field.....	1
DMSG1402	Ultrasound Cross-Sectional Anatomy I.....	3
DMSG1404	Diagnostic Medical Sonography I.....	3
DMSG1405	Ultrasound Physics.....	3
DMSG1406	Clinical Ultrasound Lab I.....	3

Suggested Technical Studies Semester II

DMSG1409	Professional Development/Growth in Sonography ..	1
DMSG1410	Ultrasound Cross-Sectional Anatomy II.....	3
DMSG1411	Diagnostic Medical Sonography II.....	3
DMSG1412	Clinical Ultrasound Lab II.....	5

Suggested Technical Studies Semester III

DMSG2407	Sonography Board Reviews.....	1
DMSG2412	Clinical Ultrasound Internship I.....	11

Suggested Technical Studies Semester IV

DMSG2413	Clinical Ultrasound Internship II.....	4
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Estimated cost of books, supplies and materials: 4,483

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Surgical Technology

Surgical Technology AAS Degree (60 Credits)



Program Description

The Surgical Technology Program prepares students to function as part of the operating room team by handing instruments to the surgeon during various surgical procedures. The surgical technologist works under medical supervision to facilitate the safe and effective conduct of invasive surgical procedures. This individual acts in association with the registered nurse and surgeon to ensure that the operating room environment is safe, that equipment functions properly, and that the operative procedure is conducted under conditions that maximize patient safety. The curriculum includes classroom, laboratory and clinical experiences.

A surgical technologist possesses expertise in the theory and application of sterile and aseptic technique and combines the knowledge of human anatomy, surgical procedures and implementation tools and technologies to facilitate a physician's performance of invasive therapeutic and diagnostic procedures. Personal qualities of patience, manual dexterity and the ability to work under stress and to stand for long periods of time are necessities in this field.

Degree Specific Program Requirements: A background check, including fingerprinting, will be completed as a requirement of this program. At the time of the background check submission, students must provide documentation as required by the MN Department of Human Services. If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study, or on your ability to obtain federal, state, and other higher education financial aid. Students who have earned a grade of "C" or better, in all required classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the AAS degree. Students will be asked to sign an acknowledgement of policies pertaining to drug and alcohol use prior to the clinical experience. This profession does require some lifting. A physical examination is required prior to clinical practice.

Accreditation Information: This program is nationally accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP), Accreditation Review Council on Education in Surgical Technology and Surgical Assisting (ARC-STSA), 6 West Dry Creek Circle, Suite 110, Littleton, CO 80120, (303) 694-9262, Fax: (303) 741-3655, www.arcstsa.org and by the Commission on Accreditation of Allied Health Education Programs (CAAHEP), 1361 Park Street, Clearwater, FL 33756, (727) 210-2350, Fax: (727) 210-2350, <http://www.caahep.org>. Students join the Association of Surgical Technologists and graduates of the Surgical Technology Program will be eligible to take the National Certification Examination.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Employment options include but are not limited to hospitals, same day surgery centers, and specialty clinics.

Technical Study Prerequisites

HLTH1440	Medical Terminology.....	1
BLGY1351	General Biology.....	4
BLGY2310	Human Anatomy/Physiology I	4
BLGY2320	Human Anatomy Physiology II	4
CMST2310	Interpersonal Communication	3
DVRS1304	Diversity and Social Justice.....	3
PHIL1320	Ethics	3
MNTC	Goal Area 1 - Written Communication.....	3

Current Healthcare Provider certificate, CPR/AED required before beginning the Surge Tech program. Students are required to maintain this certificate throughout the program.

All acceptance requirement courses must be completed with a grade of "C" or better and cumulative GPA of 2.5 prior to admission to the program.

Suggested Technical Studies Semester I

SURG1400	Medical Microbiology	2
SURG1404	Surgical Pharmacology	2
SURG1420	Operating Room Techniques	3
SURG1424	Operating Room Techniques Lab	4

Suggested Technical Studies Semester II

SURG1442	Surgical Procedures I.....	6
SURG1462	Operating Room Clinical Lab I	14

Suggested Technical Studies Semester III (May term)

SURG1443	Surgical Procedures II.....	1
SURG1463	O.R. Clinical Lab II	3

Estimated cost of books, supplies and materials: 3,065

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Surgical Technology

Surgical Technology Diploma (49 Credits)



Program Description

The Surgical Technology Program prepares students to function as part of the operating room team by handing instruments to the surgeon during various surgical procedures. The surgical technologist works under medical supervision to facilitate the safe and effective conduct of invasive surgical procedures. This individual acts in association with the registered nurse and surgeon to ensure that the operating room environment is safe, that equipment functions properly, and that the operative procedure is conducted under conditions that maximize patient safety. The curriculum includes classroom, laboratory and clinical experiences.

A surgical technologist possesses expertise in the theory and application of sterile and aseptic technique and combines the knowledge of human anatomy, surgical procedures and implementation tools and technologies to facilitate a physician's performance of invasive therapeutic and diagnostic procedures. Personal qualities of patience, manual dexterity and the ability to work under stress and to stand for long periods of time are necessities in this field.

Degree Specific Program Requirements: A background check, including fingerprinting, will be completed as a requirement of this program. At the time of the background check submission, students must provide documentation as required by the MN Department of Human Services. If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study, or on your ability to obtain federal, state, and other higher education financial aid. Students who have earned a grade of "C" or better, in all required classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the diploma. Students will be asked to sign an acknowledgement of policies pertaining to drug and alcohol use prior to the clinical experience. This profession does require some lifting. A physical examination is required prior to clinical practice.

Accreditation Information: This program is nationally accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP), Accreditation Review Council on Education in Surgical Technology and Surgical Assisting (ARC-STSA), 6 West Dry Creek Circle, Suite 110, Littleton, CO 80120, (303) 694-9262, Fax: (303) 741-3655, www.arcstsa.org and by the Commission on Accreditation of Allied Health Education Programs (CAAHEP), 1361 Park Street, Clearwater, FL 33756, (727) 210-2350, Fax: (727) 210-2350, <http://www.caahep.org>. Students join the Association of Surgical Technologists and graduates of the Surgical Technology Program will be eligible to take the National Certification Examination.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Employment options include but are not limited to hospitals, same day surgery centers, and specialty clinics.

Technical Studies Pre-requisites:

HLTH1440	Medical Terminology.....	1
BLGY1321	Human Biology.....	4
CMST2310	Interpersonal Communication	3
DVRS1304	Diversity and Social Justice.....	3
PHIL1320	Ethics	3

Current Healthcare Provider certificate, CPR/AED required before beginning the Surgical Technology program. Students are required to maintain this certificate throughout the program.

*All acceptance requirement courses must be completed with a grade of "C" or better and cumulative GPA of 2.5 prior to admission into the program.

Suggested Technical Studies Semester I

SURG1400	Medical Microbiology	2
SURG1404	Surgical Pharmacology	2
SURG1420	Operating Room Techniques	3
SURG1424	Operating Room Techniques Lab	4

Suggested Technical Studies Semester II

SURG1442	Surgical Procedures I.....	6
SURG1462	Operating Room Clinical Lab I	14

Suggested Technical Studies Semester III

SURG1443	Surgical Procedures II.....	1
SURG1463	O.R. Clinical Lab II	3

Estimated cost of books, supplies and materials: 3,065

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Water Environment Technologies

Water Environment Technologies Diploma (50 Credits)



Program Description

Water Environment Technologies (WETT) is an environmental program geared toward protecting the world's most precious resource: WATER. Courses cover a variety of chemical, biological, physical and mechanical water and wastewater treatment processes and techniques being applied today. The students learn the complex processes of obtaining water from its source, through treatment, distribution, collection, and treatment again on its journey back to the source. Through this process, students learn to identify, troubleshoot, and solve problems involved with the treatment of water.

Accreditation Information: The Water Environment Technologies program is accredited by the Minnesota Department of Health <http://www.health.state.mn.us/divs/eh/water/wateroperator/> and the Minnesota Pollution Control Agency <https://www.pca.state.mn.us/water/water-quality-rules>, 520 Lafayette Road, St. Paul, MN 55155-4194, (651) 296-6300. Students who successfully pass the state exams receive Class D Water and Wastewater certificates, which are required to operate water and wastewater treatment facilities for both public and private entities.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Graduates of the Water Environment Technologies Program are prepared to accept positions as entry-level water and/or wastewater operators at various water purification facilities. A career in water treatment offers dynamic, rapid growing employment opportunities with competitive salaries and benefit packages. Students may also choose to become lab technicians, facility mechanics, equipment sales persons, solids handlers, meter readers, utility service operators, or pursue other various related positions in the water treatment field.

Suggested Technical Studies Semester I

WETT1502	Basic Laboratory Skills.....	1
WETT1506	Introduction to Water/Wastewater Technology.....	3
WETT1510	Water / Wastewater Treatment Calculations	2
WETT1514	Source Water Treatment and Development	4
WETT1518	Water Plant Operation I	3
WETT1526	Water Distribution Systems	3
WETT1530	Understanding OSHA Safety Regulations in the Water Industry.....	3

Suggested Technical Studies Semester II

WETT1522	Water Plant Operation II.....	3
WETT1534	Wastewater Plant Operation I.....	3
WETT1538	Wastewater Plant Operations II	4
WETT1542	Wastewater Laboratory Procedures	3
WETT1554	Automated Control Systems	3
WETT1558	Understanding the EPA Part 503 Biosolids Rule.....	3

Suggested Technical Studies Semester III *May Term*

WETT1546	Collection and Disinfection Systems Operation.....	3
WETT1550	Strategic Planning for Success.....	3

General Education

MnTC Goal Area 1	Communications Oral or Written.....	3
MnTC Goal Areas 2 through 10	3

Estimated cost of books, supplies and materials: 1,590

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Water Environment Technologies

Water Environment Technologies AAS Degree (62 Credits)



Program Description

Water Environment Technologies (WETT) is an environmental program geared toward protecting the world's most precious resource: WATER. Courses cover a variety of chemical, biological, physical and mechanical water and wastewater treatment processes and techniques being applied today. The students learn the complex processes of obtaining water from its source, through treatment, distribution, collection, and treatment again on its journey back to the source. Through this process, students learn to identify, troubleshoot, and solve problems involved with the treatment of water.

After reviewing comparable Minnesota State college programs, this program exceeds 60 credits for one or more of the following reasons: national or international program certification, national or international standards including skill standards, standards recommended by a primary employer or multiple employers, national specialized program accreditation, state licensure requirements, and/or national practices or standards.

Accreditation Information: The Water Environment Technologies program is accredited by the Minnesota Department of Health and the Minnesota Pollution Control Agency, 520 Lafayette Road, St. Paul, MN 55155-4194, (651) 296-6300. Students who successfully pass the state exams receive Class D Water and Wastewater certificates, which are required to operate water and wastewater treatment facilities for both public and private entities.

The general education courses may transfer and are part of the Minnesota Transfer Curriculum (MnTC).

Career Opportunities

Graduates of the Water Environment Technologies Program are prepared to accept positions as entry-level water and/or wastewater operators at various water purification facilities. A career in water treatment offers dynamic, rapid growing employment opportunities with competitive salaries and benefit packages. Students may also choose to become lab technicians, facility mechanics, equipment sales persons, solids handlers, meter readers, utility service operators, or pursue other various related positions in the water treatment field.

Suggested Technical Studies Semester I

WETT1502	Basic Laboratory Skills.....	1
WETT1506	Introduction to Water/Wastewater Technology.....	3
WETT1510	Water / Wastewater Treatment Calculations	2
WETT1514	Source Water Treatment and Development	4
WETT1518	Water Plant Operation I	3
WETT1526	Water Distribution Systems	3
WETT1530	Understanding OSHA Safety Regulations in the Water Industry.....	3

Suggested Technical Studies Semester II

WETT1522	Water Plant Operation II.....	3
WETT1534	Wastewater Plant Operation I.....	3
WETT1538	Wastewater Plant Operations II	4
WETT1542	Wastewater Laboratory Procedures	3
WETT1554	Automated Control Systems	3
WETT1558	Understanding the EPA Part 503 Biosolids Rule.....	3

Technical Electives

Technical Electives	3
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Suggested Technical Studies Semester III *May term*

WETT1546	Collection and Disinfection Systems Operation.....	3
WETT1550	Strategic Planning for Success.....	3

General Education

MNTC Goal Area 1 Communications-Oral	3
MNTC Goal Area 1 Communications-Written	3
MNTC Goal Areas 2 - 10	9

Courses must be from at least 3 different MNTC Goal Areas

Estimated cost of books, supplies and materials: 1,590

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Welding/Fabrication

Welding/Fabrication Diploma (37 Credits)



Program Description

The Welding Program provides both practical and theoretical knowledge for qualified welding technicians. The specific subjects include: Shielded Metal Arc Welding, Oxy-Acetylene Welding and Brazing, Gas Metal Arc Welding, Gas Tungsten Arc Welding, Cutting Processes-fuel gas and plasma, Metallurgy, Fabrication and Equipment, Automated Machining, CADD Drafting, Blueprint Reading and Math. Safety procedures are also an important part of each welding process. Written and Fundamental tests will be done in accordance with the American Welding Society (AWS) SENSE curriculum and code books.

Degree Specific Program Requirements: Students who have earned a grade of "C" or better, in all required classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for the diploma.

The general studies courses are technically focused and not designed for transfer.

Career Opportunities

Positions for graduates may be found in fabricating, plant maintenance, structural steel, pipe fitting, plumbing, and in sales. Many students will find opportunities in supervisory positions after gaining some experience on the job.

Suggested Technical Studies Semester I

TECH1550	Basic CADD	2
TECH1556	Basic Manual - Automated Machining	2
WELD1505	Arc Welding Processes	5
WELD1515	Thermal Welding and Cutting Process	3
WELD1520	Metallurgy & Safety in Fabrication	3
WELD1529	Print Reading & Math Applications	2

Suggested Technical Studies Semester II

WELD1533	Blueprint Reading II	1
WELD1540	Arc Welding Processes II.....	6
WELD1545	Gas Tungsten Arc Welding	4
WELD1558	Robotics, Inspection, and Testing	3

General Education

ENGL1100	General Studies - Written Communication	3
GBEH1100	General Studies - Human Relations	3

Estimated cost of books, supplies and materials: 1,795

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

General Studies & Developmental Courses

General Studies Courses

BUSM 1207	Basic Keyboarding	1 Credit
BUSM 1267	Introduction to Business	2 Credits
BUSM 2275	Legal Environment of Business	3 Credits
CACE 1420	Foundations of Development	3 Credits
CPTR 1210	Introduction to Computers.....	3 Credits
EMSC 1420	AHA Heartsaver CPR and First Aid.....	1 Credit
ENGL 1100	Writing for the Workplace	3 Credits
FNCR 1200	Personal Money Management	3 Credits
GBEH 1100	Human Relations	3 Credits
GBUS 1320	Professional Development I	1 Credit
GBUS 1324	Professional Development II.....	1 Credit
GBUS 1328	Professional Development III.....	1 Credit
GTEC 1304	The Automobile in America	3 Credits
INTS 1155	Student Success Seminar.....	2 Credits
READ 1112	Study Strategies.....	3 Credits
SAMG 1211	Professional Sales Fundamentals	3 Credits
SAMG 2285	Entrepreneurship	3 Credits
TECH 1530	Computer Applications.....	2 Credits
TECH 1550	Basic CADD.....	2 Credits
WELD 1502	Welding for Work and Leisure	2 Credits

Developmental Courses

ENGL 0900	Writing Fundamentals	3 Credits
ESOL 0710	Foundations for Grammar and Writing	4 Credits
ESOL 0720	Foundations of Reading and Vocabulary..	4 Credits
ESOL 0730	Foundations of Speaking and Listening ...	4 Credits
ESOL 0810	Writing for Academic Purposes.....	4 Credits
ESOL 0820	Reading for Academic Purposes.....	3 Credits
ESOL 0830	Speaking and Listening for Academic Purposes	3 Credits
ESOL 0910	Writing for College.....	3 Credits
ESOL 0920	Reading for College.....	3 Credits
ESOL 0930	Speaking and Listening for College	3 Credits
MATH 0406	Foundations for College Mathematics	2 Credits
MATH 0420	Pathway to College Mathematics	4 Credits
MATH 0475	Principles of Intermediate Algebra.....	4 Credits
MATH 0485	Principles of Int. Algebra - Accelerated ..	3 Credits
READ 0900	Reading Fundamentals	3 Credits

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Minnesota Transfer Curriculum Courses

1 - Written/Oral Communication (Goal Area 1)

CMST 1320	Introduction to Communication Studies...	3 Credits
CMST 2300	Introduction to Public Speaking	3 Credits
CMST 2302	Small Group Communication.....	3 Credits
CMST 2310	Interpersonal Communication	3 Credits
CMST 2315	Persuasion and the Media.....	3 Credits
ENGL 1302	Analytical Writing	4 Credits
ENGL 1303	Technical Writing	3 Credits
ENGL 1308	Stretch Analytical Writing I.....	3 Credits
ENGL 1309	Stretch Analytical Writing II	3 Credits
ENGL 2310	Introduction to Creative Writing	3 Credits

2 - Critical Thinking (Goal Area 2)

CRTK 1300	Introduction to Critical Thinking	3 Credits
PHIL 1340	Introduction to Logic.....	3 Credits
WMST 1300	Introduction to Women's Studies	3 Credits

3 - Natural Science (Goal Area 3)

ASTR 1300	Astronomy	3 Credits
ASTR 1301	Astronomy Lab.....	1 Credit
BLGY 1321	Human Biology	4 Credits
BLGY 1325	Nutrition	3 Credits
BLGY 1351	General Biology I.....	4 Credits
BLGY 1355	General Biology II.....	4 Credits
BLGY 2310	Human Anatomy/Physiology I.....	4 Credits
BLGY 2320	Human Anatomy/Physiology II.....	4 Credits
BLGY 2330	Microbiology	4 Credits
BLGY 2340	Genetics	4 Credits
CHEM1305	Chemistry for the Non-Scientist.....	4 Credits
CHEM 1340	Introduction to General Chemistry	4 Credits
CHEM1342	Organic and Biological Chemistry	5 Credits
CHEM 1350	General Chemistry I	4 Credits
CHEM 1355	General Chemistry II.....	4 Credits
EASC 1310	Meteorology	4 Credits
ENVR 1305	Environmental Science.....	4 Credits
ENVR 1310	Environmental Issues	3 Credits
ENVR 1315	Natural Resource Conservation.....	3 Credits
GEOL1300	Geology	4 Credits
PHYS 1305	Conceptual Physics	4 Credits
PHYS 2300	General Physics	4 Credits
PHYS 2310	Engineering Physics I.....	5 Credits
PHYS 2320	Engineering Physics II.....	5 Credits

4 - Mathematics (Goal Area 4)

MATH 1300	College Algebra.....	3 Credits
MATH 1321	College Trigonometry	3 Credits
MATH 1331	Applications of Mathematical Reasoning	3 Credits
MATH 1350	Introduction to Statistics (ends fall 2017)	3 Credits

MATH 1351	Introductory Statistics (spring 18).....	4 Credits
MATH 1380	Precalculus.....	5 Credits
MATH 2310	Calculus I.....	4 Credits
MATH 2320	Calculus II	4 Credits
MATH 2330	Calculus III: Multivariable Calculus	4 Credits
MATH 2340	Differential Equations.....	5 Credits
PHIL 1340	Introduction to Logic.....	3 Credits

5 - Social, Behavior Sciences, History (Goal Area 5)

ANTH 1300	Introduction to Cultural Anthropology	3 Credits
ANTH 2300	Anthropology of Science Fiction	3 Credits
DVRS 1304	Diversity and Social Justice	3 Credits
ECON 2320	Introduction to Macroeconomics.....	3 Credits
ECON 2330	Introduction to Microeconomics	3 Credits
GEOG 1300	World Regional Geography	3 Credits
GERO 1300	Gerontology.....	3 Credits
HIST 1310	American History Until 1877	3 Credits
HIST 1311	The United States Since 1877	3 Credits
HIST 1320	World History to 1500.....	3 Credits
HIST 1330	World War II.....	3 Credits
HIST 1340	Contemporary World History	3 Credits
POLS 1304	Introduction to American Politics.....	3 Credits
POLS 1320	Public Issues	3 Credits
PSYC 1300	Introduction to Psychology	3 Credits
PSYC 1304	Life Span Developmental Psychology	3 Credits
PSYC 1310	Psychology of Women.....	3 Credits
PSYC 1320	Psychology of Trauma.....	3 Credits
PSYC 1350	Positive Psychology	3 Credits
PSYC 2310	Abnormal Psychology	3 Credits
PSYC 2320	Social Psychology	3 Credits
PSYC 2330	Statistics for Psychology/Behav Sciences	4 Credits
SOCI 1310	Introduction to Sociology	3 Credits
SOCI 1320	Social Problems.....	3 Credits
SOCI 1350	Sociology of Marriage and Family.....	3 Credits
SOCI 1360	The Politics of Food	3 Credits
SOCI 2305	Environmental Sociology	3 Credits
SSCI 1300	Introduction to the Social Sciences	3 Credits

6 - Humanities-Arts, Lit and Philosophy (Goal Area 6)

ART 1300	Art Appreciation.....	3 Credits
ART 1310	2D Design.....	4 Credits
ART 1321	Drawing I.....	4 Credits
ART 1330	Painting I	4 Credits
ART 1340	Digital Photography	4 Credits
ENGL 1321	Introduction to Modern Fiction	3 Credits
ENGL 1322	Introduction to Literature	3 Credits
ENGL 1340	Introduction to Multicultural Literature ...	3 Credits
ENGL 1341	Introduction to Women's Literature	3 Credits

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

6 - Humanities-Arts, Lit and Philosophy (Continued)

ENGL 1342	Middle Eastern Literature.....	3 Credits
ENGL 1345	Gender in Literature	3 Credits
ENGL 2310	Introduction to Creative Writing	3 Credits
HUMN 1320	Holocaust and Genocide Studies.....	3 Credits
HUMN 1340	Middle Eastern Cultures.....	3 Credits
HUMN 2350	Film and American Culture.....	3 Credits
HUMN 2352	Holocaust Field Studies.....	1 Credit
MUSC 1320	Music in World Culture	3 Credits
MUSC 1340	History of Rock and Roll	3 Credits
MUSC 1350	Experiencing Live Music	3 Credits
MUSC 1360	Class Voice	3 Credits
PHIL 1310	Introduction to Philosophy	3 Credits
PHIL 1320	Ethics	3 Credits
PHIL 1360	Comparative World Religions	3 Credits
SPAN 2320	Intermediate Spanish II	4 Credits
THTR 1310	Theatre Appreciation	3 Credits
THTR 1360	Acting for Everyone	3 Credits

7 - Human Diversity (Goal Area 7)

DVRS 1304	Diversity and Social Justice	3 Credits
DVRS 2301	Race and Ethnic Relations.....	3 Credits
ENGL 1340	Introduction to Multicultural Literature ...	3 Credits
ENGL 1341	Introduction to Women's Literature	3 Credits
ENGL 1345	Gender in Literature	3 Credits
GERO 1300	Introduction to Gerontology.....	3 Credits
HASL 1300	American Sign Language	3 Credits
PSYC 1310	Psychology of Women.....	3 Credits
SOCI 1350	Sociology of Family and Marriage.....	3 Credits
WMST 1300	Introduction to Women's Studies	3 Credits

8 - Global Perspective (Goal Area 8)

ANTH 1300	Introduction to Cultural Anthropology.....	3 Credits
ANTH 2300	Anthropology of Science Fiction	3 Credits
ENGL 1321	Introduction to Modern Fiction	3 Credits
ENGL 1342	Middle Eastern Literature.....	3 Credits
GEOG 1300	World Regional Geography.....	3 Credits
HASL 1408	American Sign Language III.....	3 Credits
HASL 1412	American Sign Language IV.....	3 Credits
HIST 1320	World History to 1500.....	3 Credits
HIST 1330	World War II.....	3 Credits
HIST 1340	Contemporary World History	3 Credits
HUMN 1340	Middle Eastern Cultures.....	3 Credits
MUSC 1320	Music in World Culture	3 Credits
PHIL 1360	Comparative World Religions	3 Credits
SPAN 1310	Beginning Spanish I	4 Credits
SPAN 1320	Beginning Spanish II.....	4 Credits
SPAN 2310	Intermediate Spanish I.....	4 Credits
SPAN 2320	Intermediate Spanish II	4 Credits

9 - Ethical and Civic Responsibility (Goal Area 9)

CMST 2302	Small Group Communication.....	3 Credits
CMST 2315	Persuasion and the Media.....	3 Credits
ECON 1310	Personal Finance.....	3 Credits

HIST 1310	American History Until 1877.....	3 Credits
HIST 1311	The United States Since 1877	3 Credits
HUMN 1320	Holocaust and Genocide Studies.....	3 Credits
PHIL 1320	Ethics	3 Credits
POLS 1304	Introduction to American Politics.....	3 Credits
POLS 1320	Public Issues	3 Credits
SOCI 1360	The Politics of Food	3 Credits

10 - People and the Environment (Goal Area 10)

BLGY 1351	General Biology	4 Credits
CHEM1305	Chemistry for the Non-Scientist.....	4 Credits
ECON 1340	Environmental Economics	3 Credits
ENVR 1305	Environmental Science.....	4 Credits
ENVR 1310	Environmental Issues	3 Credits
ENVR 1315	Natural Resource Conservation.....	3 Credits
SOCI 2305	Environmental Sociology	3 Credits

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Course Descriptions

(alphabetical by course number)

ABCT 1526 - Refinishing Lab II

The student will continue to develop skills in overall refinishing, spot repair, color match and blend, and reconditioning. Students will satisfactorily complete projects using knowledge and skills learned in previous refinishing courses, according to NATEF and I-CAR standards.

Student Learning Outcomes:

All listed outcomes must be performed to acceptable levels of I-CAR and NATEF Standards.

- * Distinguish varied color matching and blending processes
- * Apply spot refinishing techniques according to NATEF/I-CAR standards
- * Complete panel refinishing procedures to complete reconditioning of vehicle
- * Adopt shop safety and operations as outlined in the program requirements

Corequisite(s): ABCT1530

Prerequisite(s): ABCT1518.

(3 C: 0 lect/pres, 3 lab, 0 other)

ABCT 1530 - Color Match and Blend

This course is a lecture/lab enabling a student to develop professional skills in spot repair, blending, tinting and panel refinishing. Practical application will be done on production projects according to NATEF/ I-CAR standards. Student Learning Outcomes:

All listed outcomes must be performed to acceptable levels of I-CAR and NATEF Standards.

- * Perform color matching procedures
- * Perform color tinting procedures
- * Plan and implement spot repair processes
- * Apply varied top coat materials to restore surface
- * Complete interior and exterior vehicle preparation
- * Adopt shop safety and operation as outlined in the program requirements

Prerequisite(s): ABCT1522.

(3 C: 1 lect/pres, 2 lab, 0 other)

ABCT 1538 - Auto Restoration

This course will emphasize the repair of older vehicles not normally associated with collision repair. Topics will include: panel replacement, rust repair, body filler application, corrosion protection, and primer application.

Student Learning Outcomes:

- * Examine factors determining repair vs. replacement
- * Identify metal straightening methods
- * Determine the extent of direct and indirect damage and develop a repair plan
- * Identify welding and cutting procedures
- * Perform welding and cutting procedures
- * Identify and use filler products
- * Identify and use primers
- * Identify and use abrasives
- * Discuss restoration levels
- * Comply with personal and environmentally safe practices
- * Perform metal straightening and panel replacement procedures

(2 C: 1 lect/pres, 1 lab, 0 other)

ABCT 1541 - Advanced and Custom Refinishing

This course will explore various techniques of advanced refinishing such as: tinting, blending, masking, and tri-stage color application. Students will use a variety of types of refinishing equipment and materials to produce let-down panels spray tri-stage paints and have the opportunity to design, mask, and spray custom designed panels of their own.

Student Learning Outcomes:

- * Identify various masking techniques

- * Discuss tinting and blending on a variety of paints and colors
 - * Identify problems associated with tri-stage and mica paints and applications
 - * Identify and comply with personal safety practices
 - * Apply tri-stage and custom finish materials
 - * Identify paint gun types, set-up, and variations
 - * Discuss paint mixing and spraying considerations
- (2 C: 1 lect/pres, 1 lab, 0 other)

ABCT 1545 - Collision Repair Industry

This course combines lecture and laboratory practice to introduce students to the knowledge and skills required in the auto body industry. The course introduces students to industry equipment and processes. Students will be instructed on safety and basic familiarization with industry related terminology. Written and demonstration tests will be done in accordance with Inter-Industry Convent on Auto Collision Repair (I-CAR) and National Automotive Technicians Education Foundation (NATEF) curriculum and online learning modules.

Student Learning Outcomes:

- * Apply personal and shop safety practices according to I-CAR and NATEF standards.
- * Describe the collision repair industry and related career choices.
- * Define safety and environmental issues related to the work place.
- * Identify automotive panels and parts to 90% accuracy.
- * Name auto body trim and hardware.
- * Identify hand, power tools, and equipment.
- * Show appropriate use of auto body specific tools.
- * Define auto body vehicle terminology according to I-CAR classes.
- * Identify different types of vehicle damage.
- * Perform vehicle reconditioning procedures on customer vehicles to industry standards.

(3 C: 2 lect/pres, 1 lab, 0 other)

ABCT 1550 - Repair Plan Process

This course will introduce students to the repair plan process in the auto body industry. This course covers the repair process from beginning to end. Students will learn the basics of the insurance industry, estimating, blue-printing, repair orders and the importance of a repair plan. Becoming familiar with manuals, forms, computer programs and common industry approaches is an integral part of this course.

Student Learning Outcomes:

- * Interpret parts diagrams and vehicle identification codes.
- * Describe repair orders, estimates, and the blue-printing process.
- * Complete blue printing process to reveal hidden collision damage.
- * Explain how repair time is calculated and related to technician's efficiency.
- * Prepare repair orders and estimates.
- * Explain the insurance industry's impact on the repair plan.
- * Demonstrate the use of various industry specific computer programs.

(2 C: 1 lect/pres, 1 lab, 0 other)

ABCT 1555 - Collision Welding

With the construction of today's vehicles, welding is an important part of auto body repair. This course covers safety procedures, basic welding on steel and galvanized metals, introduction to aluminum and silicon-bronze welding, plasma cutting and Inter-Industry Conference on Auto Collision Repair (I-CAR) welding standards. Major emphasis is placed on collision facility Metal Inert Gas (MIG) welding and welding according to I-CAR standards.

Student Learning Outcomes:

- * Identify preferred safety procedures in welding.
- * Reproduce collision repair MIG welds according to I-CAR standards.

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

- * Describe and practice the use of collision industry welding equipment for aluminum, silicon bronze and MIG welding procedures.
 - * Select appropriate welding or cutting tools based on work to be performed.
 - * Reproduce auto body cutting, drilling, and threading to Automotive Service Excellence (ASE) and I-CAR standards.
 - * Choose and utilize appropriate Personal Protective Equipment (PPE) and safety equipment.
 - * Locate and identify collision repair welds and explain their structural differences.
- (2 C: 1 lect/pres, 1 lab, 0 other)

ABCT 1560 - Sheet Metal Repair

This course combines lecture and laboratory practice to introduce students to the concepts, terminology and industry accepted methods of sheet metal repair. The course will cover metal straightening, body filler, and substrate preparation up to final sanding of primer. Time will be spent in the lab using both demonstration and hands on processes. Students will be tested using both written and hands on assessments in accordance with industry standards. The understanding of basic metal straightening fundamentals will allow students to begin to analyze and develop repair plans consistent with industry accepted standards.

Student Learning Outcomes:

- * Demonstrate proper selection and use of metal straightening tools.
 - * Locate and identify damage in sheet metal.
 - * Compare the types, purpose and composition of body fillers and demonstrate various application techniques.
 - * Select proper grit sand paper based on repair steps and technical data sheets.
 - * Identify and repair imperfections in body filler.
 - * Estimate amount of time needed for basic dent repair.
 - * Summarize and demonstrate the steps of sheet metal repair up to final sanding of primer.
 - * Describe and practice the use of basic primer equipment and application procedures according to technical data sheets.
 - * Demonstrate basic methods of sheet metal repair.
- (4 C: 2 lect/pres, 2 lab, 0 other)

ABCT 1565 - Production Lab I

Students apply basic procedures on production type vehicles and projects according to National Automotive Technicians Education Foundation (NATEF) and Inter-Industry Conference on Auto Collision Repair (I-CAR) standards. This is a lab course in which students apply and refine skills learned in previous courses. Students accomplish this by having the opportunity to observe, practice and demonstrate these skills in an industry like setting. Instructor guided projects along with live customer work allow students to experience a wide range of structured reinforcement of skills specific to their major. Emphasis will be placed on demonstrating the principles of dent repair to industry standards and completing entry level technician processes.

Student Learning Outcomes:

- * Perform daily work according to repair order process.
 - * Update supplement repair order as needed.
 - * Analyze basic types of auto body damage.
 - * Perform detailing of vehicles.
 - * Perform disassembly and assembly of vehicles.
 - * Perform metal finishing techniques to industry standards.
 - * Demonstrate methods of applying and sanding body filler to industry standards.
 - * Complete panel removal, replacement and adjustment.
 - * Perform corrosion protection according to manufacturer and industry standards.
 - * Demonstrate Metal Inert Gas (MIG) welding to I-CAR Standards.
 - * Show safe shop operation practices.
- (4 C: 0 lect/pres, 4 lab, 0 other)

ABCT 1570 - Basic Refinish

The refinish process includes many procedures and products. This course will look at the steps necessary to complete a variety of basic refinish practices. Students will be introduced to a variety of subjects related to the refinish process including abrasives, undercoats, and topcoats. Emphasis will be put on spray gun setup, spray techniques, and product application.

Student Learning Outcomes:

- * Apply refinishing safety practices.
- * Identify and explain appropriate refinishing process.

- * Select appropriate materials according to the technical data sheets.
 - * Demonstrate surface preparation techniques according to materials being applied.
 - * Show proper paint gun techniques.
 - * Perform proper mixing of refinish materials according to the technical data sheets.
 - * Apply base coat and clear coat according to Inter-Industry Conference on Auto Collision Repair (I-CAR), National Automotive Technicians Education Foundation (NATEF), and manufacturer standards.
 - * Explain refinish material safety and environmental hazards.
 - * Prepare plastic substrate for the refinish process in accordance with technical data sheets.
 - * Identify differences between solvent and waterborne refinish materials.
 - * Demonstrate safe shop operation practices.
 - * Perform masking techniques to industry standards.
- (4 C: 2 lect/pres, 2 lab, 0 other)

ABCT 1575 - Emerging Technology and Industry Preparation

The collision repair industry is ever changing and evolving as new technology is incorporated into vehicles being produced. This course will explore new technologies and how it will affect technicians in the future. This course also helps students prepare for the work force in the collision industry. Students write resumes, fill out job applications, discuss customer relations, and explore expectations of the collision industry.

Student Learning Outcomes:

- * Identify new technologies in collision repair.
 - * Discuss and demonstrate effective methods of communication in the workplace.
 - * Produce job seeking documents related to the collision industry.
 - * Examine methods of improving customer relations.
 - * List and explain new vehicle designs, materials, safety features, and alternate fuel systems and their effects on shop processes.
- (2 C: 2 lect/pres, 0 lab, 0 other)

ABCT 1580 - Non Steel Substrate Repair

As weight reduction becomes a driving force to improve fuel economy, manufacturers are looking at alternative materials to build vehicles with. Plastics have been used for many years for vehicle construction, but technicians are being expected to repair more plastics each year. Aluminum has been used on expensive luxury and sports cars but now it is being used on mainstream everyday vehicles. This means tomorrow's technicians will need to repair these substrates with skill and accuracy. Students are introduced to industry accepted methods of repairing both plastic and aluminum. Students in this course will be expected to complete both theory and hands on projects.

Student Learning Outcomes:

- * Demonstrate safe shop operation practices.
 - * Explain different techniques used in repairing plastic and aluminum.
 - * Identify different types of plastic.
 - * Perform plastic welding according to industry standards.
 - * Perform adhesive repairs according to technical data sheets.
 - * Calculate cost of repair versus replacement.
 - * Explain the importance of separating aluminum repair tools from steel repair tools.
 - * Perform aluminum welding to I-CAR standards.
 - * Repair aluminum substrate according to I-CAR standards.
 - * Choose proper materials to apply on non-steel substrates.
 - * Repair SMC and fiberglass according to technical data sheets and manufacturer standards.
- (4 C: 2 lect/pres, 2 lab, 0 other)

ABCT 1585 - Production Lab II

Students demonstrate collision repair procedures on production type vehicles and projects according to National Automotive Technicians Education Foundation (NATEF) and Inter-Industry Conference on Auto Collision Repair (I-CAR) standards. Students gain additional hands on experience and continue to refine skills learned in previous courses. Students accomplish this by having the opportunity to observe, practice and demonstrate their skills in an industry like setting. Emphasis will be placed on demonstrating the principles of refinish preparation, refinishing and dent repair.

Student Learning Outcomes:

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

- * Perform daily work according to repair order process.
 - * Update supplement repair order as needed.
 - * Analyze basic types of auto body damage.
 - * Demonstrate proper use of aluminum and plastic repair equipment.
 - * Compare different types of repair methods of plastics.
 - * Perform metal finishing techniques to industry standards.
 - * Demonstrate methods of applying and sanding body filler on plastic and aluminum to industry standards.
 - * Complete panel removal, replacement and adjustment.
 - * Describe and practice the use of refinishing equipment and proper paint application techniques.
 - * Demonstrate Metal Inert Gas (MIG) aluminum welding to I-CAR Standards.
 - * Show safe shop operation practices.
- (4 C: 0 lect/pres, 4 lab, 0 other)

ABCT 2510 - Damage Analysis and Measuring Systems

Vehicles are built to very close tolerances and standards. During the repair process these standards must be duplicated. Students will identify frame designs, use measuring equipment, and analyze damage to create repair plans that will be used to perform repairs.

Student Learning Outcomes:

All listed outcomes must be performed to acceptable levels of I-CAR and NATEF Standards.

- * Visually and mechanically analyze frame and unibody damage to determine their repair ability.
 - * Prepare different types of vehicles for measuring and pulling.
 - * Make upperbody and underhood measurement.
 - * Use manual frame gauges and computer aided frame analysis equipment.
 - * Create a repair plan based on a complete analysis of damage and manufactures recommendations.
 - * Anchor and repair unibody and conventional frames.
 - * Comply with all safety and operations as outlined in the program requirements.
- Corequisite(s): ABCT2518
Prerequisite(s): ABCT1506, ABCT1514, ABCT1510.
(3 C: 1 lect/pres, 2 lab, 0 other)

ABCT 2514 - Plastic Repair

Plastics have become an integral part of automobile design and construction. Identification and the repair of these products has become a must for the collision technician. Topics include: plastic welding, SMC repair, adhesive repair, and plastic refinishing.

Student Learning Outcomes:

- * Identify the types of plastic
 - * Identify and perform hot air and airless welding procedures
 - * Identify and perform adhesive repair procedures
 - * Identify and perform personal and environmentally safe work habits
 - * Determine feasibility of repair vs. replacement of plastic parts
 - * Identify and perform plastic parts refinishing procedures
 - * Repair SMC parts
- (2 C: 1 lect/pres, 1 lab, 0 other)

ABCT 2518 - Collision Repair Lab II

This course will run concurrent with Damage Analysis and Measuring Systems. Students will use repair plans to perform repairs on collision damaged unibody and conventional frame vehicles.

This is a variable credit course, with 1-3 credits.

Student Learning Outcomes:

- * Comply with personal safety practices
 - * Use collision repair manuals
 - * Analyze unibody and conventional frame damage
 - * Use measuring equipment
 - * Anchor and repair unibody and conventional frames
 - * Demonstrate teamwork
- (C: 0 lect/pres, 3 lab)

ABCT 2522 - Structural Damage Repair

With high strength steel, lighter sheet metal, and glass being used for structural support, today's technicians must fully understand how the automobile func-

tions as a complete unit. Students will identify and perform repairs on structural components in accordance with industry standards.

Student Learning Outcomes:

All listed outcomes must be performed to acceptable levels of I-CAR and NATEF Standards.

- * Identify and use I-CAR welding standards to replace weld-on panels.
- * Locate and utilize manufactures or I-CAR repair recommendations.
- * Access damage on structural and non structural panels and determine repair or replacement decisions to complete needed repairs.
- * Perform shop safety and operations as outlined in the program requirements.
- * Install stationary glass using manufactures or I-CAR installation procedures.
- * Replace seam sealers, foams, and corrosion protection materials.

Prerequisite(s): ABCT2510.

(4 C: 1 lect/pres, 3 lab, 0 other)

ABCT 2527 - Collision Repair Lab III

This lab will run concurrent with ABCT 2522 Structural Repair. It will allow students the necessary time to perform structural and non-structural repairs.

Student Learning Outcomes:

All listed outcomes must be performed to acceptable levels of I-CAR and NATEF Standards.

- * Prepare estimate/s of repairs.
- * Organize repair procedure/process.
- * Complete structural, non-structural and refinish process according to ASE/ICAR standards.
- * Select and utilize the appropriate tools, supplies and equipment.
- * Manage repair process according to flat-rate standards.
- * Perform shop safety and operations as outlined in the program requirements

Prerequisite(s): ABCT2518.

(4 C: 0 lect/pres, 4 lab, 0 other)

ABCT 2534 - Collision Repair Lab IV

In the collision industry attention to detail, and use of time are highly prized attributes. With the aid of the instructor, students will choose projects that will enable them to hone these skills in preparation for entering the work force.

Student Learning Outcomes:

All listed outcomes must be performed to acceptable levels of I-CAR and NATEF Standards.

- * Demonstrate problem solving skills
- * Repair vehicles using an estimate as a guide of repairs needed.
- * Complete project vehicles to customer satisfaction.
- * Identify and Comply with personal safety practices.
- * Use and follow shop reference material to complete projects

Prerequisite(s): ABCT2518.

(4 C: 0 lect/pres, 4 lab, 0 other)

ABCT 2542 - Supervised Internship

Internships will help aid the student make an easier transition from school to work. Students will be placed in collision repair facilities to work side by side with journeymen technicians. Specific duties to be performed on the job will be arranged by the repair facility, instructor, and the student.

Student Learning Outcomes:

All listed outcomes must be performed to acceptable levels of I-CAR and NATEF Standards.

- * Demonstrate problem solving skills
- * Repair vehicles using an estimate as a guide of repairs needed.
- * Complete project vehicles to customer satisfaction.
- * Identify and Comply with personal safety practices.
- * Use and follow shop reference material to complete projects
- * Use time management skills
- * Demonstrate team work

Prerequisite(s): ABCT2518.

(C: 0 lect/pres, 0 lab, 0 other)

ABCT 2544 - New Technologies

This course will cover new technologies and trends in the Collision Repair industry. Students will gain knowledge about upcoming features and technologies that will affect them in the workforce. Students will accomplish Program-end Industry

Evaluations.

Student Learning Outcomes:

- * Identify and discuss new technologies in collision repair.
- * Identify and discuss industry trends.
- * Contrast new vehicle designs, materials, safety features, and alternate fuel systems
- * Complete comprehensive industry standards evaluations.

Prerequisite(s): ABCT2510.

(1 C: 1 lect/pres, 0 lab, 0 other)

ACCT 1215 - Accounting Principles I

This course is an introduction to the fundamental accounting concepts and principles used to analyze and record business transactions. Both the preparer and user perspective are emphasized. Students will explore accounting as an information system completing and analyzing various accounting projects and applying business ethics to accounting situations.

Student Learning Outcomes:

- * Understand the role of accounting in business, including the types of business organizations, business stakeholders, ethics in business and the overall profession of accounting.
- * Journalize business transactions in accordance with Generally Accepted Accounting Principles (GAAP).
- * Prepare the three basic financial statements understanding the interrelations among them.
- * Create adjusting journal entries required under the accrual method of accounting to properly update accounts at year end.
- * Define inventory systems and apply perpetual and/or periodic inventory within the accounting system.
- * Compare the direct write-off and allowance methods to account for uncollectable accounts and their affect on the financial statements.
- * Account for the purchase, maintenance (depreciation, amortization, depletion) and sale of long-term assets.
- * Differentiate between current and long-term liabilities and explain how to account for contingent and estimated liabilities.
- * Apply the concept of the time value of money.
- * Understand the corporate form of business organization, including the sources of equity, characteristics and classes of stock, and effects of dividends.
- * Account for the issuance of bonds as a method of financing a business.
- * Account for the investment in debt and equity instruments.

(4 C: 3 lect/pres, 1 lab, 0 other)

ACCT 1216 - Accounting Principles II

This course covers the analysis, from the preparer and user perspective, of business transactions related to partnerships and corporations. Topics include but are not limited to cash and cash flows, internal control, organization, capital structure, stockholders equity, earnings, dividends, fair value accounting and retained earnings statement. Also included is the related statistical financial analysis.

Student Learning Outcomes:

- * Analyze internal controls for strengths and weaknesses.
- * Prepare bank reconciliation statements and record the adjustments to the financial records.
- * Apply basic accounting concepts and principles in an ethical way to business transactions.
- * Complete accounting transactions and calculations related to partnerships and limited liability companies.
- * Summarize the types of cash flow activities reported in the statement of cash flows and prepare statement of cash flows.
- * Prepare a report on a publicly traded corporation in the areas of basic analytical procedures along with solvency and profitability analysis.
- * Complete an accounting cycle for a business using a comprehensive accounting project.
- * Journalize financial transactions using special journals.
- * Post journal entries from the general journal and special journals to the general ledger and subsidiary ledgers.
- * Report equity changes in the capital structure of a company resulting from fair value accounting.

Prerequisite(s): ACCT1215.

(4 C: 3 lect/pres, 1 lab, 0 other)

ACCT 1217 - Cost Accounting

This course will cover the fundamentals of cost accounting. Students will learn and demonstrate how to plan and control materials, labor, and overhead. Job order costing and process costing methods are covered. The course covers the daily, monthly, and annual financial and managerial accounting for a manufacturing entity. Students will practically apply knowledge to real world scenarios and learn to analyze costs related to the manufacturing process.

Student Learning Outcomes:

- * Explain how a manufacturing company is financially and structurally organized.
- * Differentiate between job order and process costing methods.
- * Identify how accounting records and procedures are established to record, transfer, and summarize manufacturing costs.
- * Prepare a statement of cost of goods manufactured, job cost sheets, departmental overhead analysis sheets, and cost of production reports.
- * Determine where cost figures originated and identify the detailed procedures and records required to account for materials, labor, and overhead.
- * Establish internal control procedures for purchasing as well as for storing and issuing materials in order to safeguard the company's investment in inventory.
- * Understand and use the concept of departmentalization to increase accountability and accuracy.
- * Calculate and apply overhead using an overhead rate system.
- * Prepare job cost sheets, departmental overhead analysis sheets, and cost of production reports.

Prerequisite(s): ACCT1215.

(4 C: 3 lect/pres, 1 lab, 0 other)

ACCT 1219 - Spreadsheets-Microsoft Excel

This course covers the most recent version of Microsoft Excel. Topics include document design and creation, format modification, and advanced formulas and functions.

Student Learning Outcomes:

- * Use mathematical functions to perform calculations
- * Use statistical functions to calculate average, count, minimum and maximum
- * Use financial functions to calculate mortgage payment, present value and future value
- * Use logical functions to evaluate performance
- * Use formulas containing relative and absolute cell references
- * Use lookup function in business environment to calculate discounts, commissions, and costs
- * Use conditional formatting to highlight exception to norm
- * Learn to manage documents, files and folders to organize spreadsheets
- * Create various chart types (Pie, Bar, Column, Scatter, and Line), label elements using spreadsheet data and use attention getters to pin point outliers
- * Use tools such as filters, hide column split screen, and freeze pane on large spreadsheet to manage data to produce information
- * Consolidate data from multiple spreadsheet/workbooks to generate information
- * Create updatable links between Excel and Word documents to produce error free communication with outside world
- * Use Excel to forecast future and to do what if analysis
- * Use Microsoft online help feature to solve unique real world situation and unexpected problems
- * Create a simple Web page and hyperlink to Excel worksheets and other web sites on the World Wide Web

Prerequisite(s): CPTR1210.

(2 C: 1 lect/pres, 1 lab, 0 other)

ACCT 1220 - Payroll Accounting

This course covers the various state and federal laws pertaining to the computation and payment of salaries and wages. Topics include preparation of employment records, payroll registers, employee earnings records, time cards, and state and federal reports.

Student Learning Outcomes:

- * Have a working knowledge of state and federal payroll laws and regulations
- * Complete a detailed payroll report for a simulated business

Corequisite(s): ACCT1215

(2 C: 1 lect/pres, 1 lab, 0 other)

ACCT 1225 - QuickBooks

This course is an introduction to computerized accounting software (QuickBooks) applications used in maintaining accounting records, generating management reports, and processing common business transactions with primary emphasis on the general ledger package. Students will further develop skills in maintaining accounting records and have exposure to the accounts receivable, accounts payable, banking, payroll and inventory modules.

Student Learning Outcomes

- * Apply Generally Accepted Accounting Principles to business transactions to create and edit purchases, sales, cash disbursements, cash receipts and general journal transactions in a computerized environment.
- * Create, edit and remove accounts in the subsidiary and general ledgers.
- * Record and edit payroll related transactions and create accurate paychecks for hourly and salaried employees.
- * Create and modify the chart of accounts and inventory items.
- * Record inventory receipts and make adjustments.
- * Produce financial statements and business reports for management use.
- * Export data from QuickBooks to a spreadsheet program for further analysis.
- * Utilize QuickBooks software to record business related banking situations, create checks, deposit slips and reconcile all banking transactions.
- * Analyze and evaluate computerized accounting records for errors and process to correct them.
- * Setup a new company for a service or merchandising business in a computerized environment and complete its accounting cycle.

Prerequisite(s): ACCT1215.

(3 C: 2 lect/pres, 1 lab, 0 other)

ACCT 2225 - Computerized Accounting Projects

Students will complete a series of projects in QuickBooks accounting software to apply learned accounting concepts. Each project is designed to increase students capacity to use the software to record, analyze, correct and report business transactions. A capstone project will include a previously completed manual practice set of accounting transactions in the QuickBooks software, demonstrating the advantages of computerized systems. A review for the QuickBooks certification exam is included in the course.

Student Learning Outcomes:

- * Setup new retail and service business files in QuickBooks.
- * Process monthly transactions and adjusting entries for a business.
- * Generate management reports and review for accuracy.
- * Setup and process quarterly payroll.
- * Complete all quarter and year end payroll tax forms.
- * Demonstrate competence in QuickBooks operations.
- * Identify and correct errors in an accounting system.
- * Prepare for QuickBooks certification.

Prerequisite(s): ACCT1216, ACCT1220, ACCT1225.

(2 C: 1 lect/pres, 1 lab, 0 other)

ACCT 2226 - Intermediate Accounting I

Students will explore accounting as a process of measurement and communication of economic data with an emphasis on recording, classifying, measuring and reporting. Procedures for the recognition of revenue and long-term debt are also included.

Student Learning Outcomes:

- * Identify and explain the basic steps in the accounting process including analyze transactions, record journal entries, complete year-end adjusting and closing entries
- * Describe the specific elements of the balance sheet and prepare a balance sheet with assets and liabilities properly classified
- * Describe the specific components of an income statement and explain how income is measured
- * Outline the structure of and information reported in the three main categories of the cash flow statement using both the direct and indirect method
- * Explain the procedures for recording revenues and long-term debt

Prerequisite(s): ACCT1216.

(4 C: 3 lect/pres, 1 lab, 0 other)

ACCT 2227 - Intermediate Accounting II

This course is designed to further develop knowledge of financial accounting theory, concepts, practice and procedures related to inventory, debt and equity

financing, fixed asset acquisition and utilization and leases. This course also incorporates financial statement analysis to develop students ability to identify key performance areas within the financial statements or possible errors/irregularities within the financial statements. Continued study of generally accepted accounting principles is also included.

Student Learning Outcomes:

- * Select and maintain an inventory valuation method based on trade-offs among income tax effects, bookkeeping costs, and the impact on the financial statements.
- * Evaluate and account for short-term and long-term debt obligations.
- * Identify the elements of a corporation's stockholder's equity and properly categorize and prepare a statement of stockholders equity.
- * Properly account for the acquisition, utilization and disposal of noncurrent operating assets by evaluating various characteristics of transactions.
- * Summarize the various characteristics of investments in debt and equity securities and apply the proper accounting treatment when recording the purchase and maintenance of these investments.
- * Evaluate the specific terms of a lease in order to properly classify and account for leases as an operating lease or a capital lease from both the lessees perspective and the lessor's perspective.
- * Design and interpret a systematic financial ratio analysis recognizing the impact that different accounting methods can have on the financial ratios of otherwise identical companies.
- * Interpret financial statement analysis for possible errors or irregularities.
- * Illustrate ethical behavior when applying accounting principles and procedures.

Prerequisite(s): ACCT2226.

(4 C: 3 lect/pres, 1 lab, 0 other)

ACCT 2229 - Managerial Accounting

Managerial accounting is the process of producing financial and operating information regarding the economic condition of the organization for users internal to the organization. The process is driven by the informational needs of individuals internal to the organization with an emphasis on cost systems, pricing decisions, budgeting, planning and controlling. This course will build student's understanding in planning operations, controlling activities, and decision making using a wide variety of practical applications.

Student Learning Outcomes:

- * Explain and illustrate the use of a standard manufacturing cost system for planning and control purposes.
- * Compute materials quantity and materials price variances and identify them as being favorable or unfavorable.
- * Learn and apply activity based costing.
- * Prepare and analyze budgets using variance analysis.
- * Differentiate between fixed and flexible budgets.
- * Understand the concepts of absorption costing and direct costing.
- * Analyze accounting data using cost-volume-profit (CVP) analysis and CVP graphing.
- * Calculate and understand the uses of break-even point (BEP) and changes in BEP.
- * Prepare and understand differential analysis reports to meet various financial objectives.
- * Prepare and analyze capital investment decisions.
- * Summarize the types of cash flow activities reported in the statement of cash flows.
- * Prepare the statement of cash flows.
- * Apply managerial accounting concepts by analyzing business scenarios.
- * Differentiate between cost, profit, and investment centers.
- * Calculate return-on-investment and residual income.
- * Make decisions based on segment analysis.

Prerequisite(s): ACCT1215.

(4 C: 3 lect/pres, 1 lab, 0 other)

ACCT 2230 - Income Tax I

This course focuses on the United States federal individual income tax. The emphasis is primarily on the interpretation of the Internal Revenue Code. Students will learn to apply the code to determine revenue items that make up gross income, deductions for adjusted gross income, itemized deductions, exemptions, and credits. Using this knowledge, students will analyze tax planning strategies. Using RIA Checkpoint, students will research tax issues, and prepare their findings in a professional manner. The lab component of the class will focus on

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preparation and filing of form 1040 and related schedules.

Student Learning Outcomes:

- * Understand and discuss tax related terminology in a professional manner.
 - * Interpret Internal Revenue codes sections as they apply to the individual income taxes.
 - * Identify differences between individual income taxes and other types of taxes, and apply this knowledge to preparation of the correct tax returns.
 - * Prepare form 1040 and accompanying schedules.
 - * Apply the knowledge gained of the Internal Revenue Code in a practical manner to tax planning and preparation.
 - * Relate federal individual income taxes to other business and individual financial matters.
 - * Research detailed tax questions using RIA Online Tax Research, and present detailed analysis of findings.
 - * Learn and apply ethical tax practices for tax planning and preparation.
- (4 C: 3 lect/pres, 1 lab, 0 other)

ACCT 2231 - Income Tax II

Income Tax II covers a variety of income tax issues. Students will focus on the federal Internal Revenue Code as it applies to corporations and partnerships and learn the similarities, differences, and relationships between individual, corporate, and partnership taxation. Forms, 1120, 1120-S, and 1065 will be used to prepare basic corporate and partnership returns. The course will use the knowledge and skills learned from Income Tax I to prepare individual federal income tax returns using computerized tax preparation software. Students will also learn the Minnesota tax statutes, and how to apply those statutes in preparing individual Minnesota income tax returns. The course also offers students the opportunity to work with the Volunteer Income Tax Assistance program.

Student Learning Outcomes:

- * Apply knowledge and understanding of the federal and state individual income tax laws by preparing individual income tax returns using a computerized income tax preparation program.
 - * Interpret and apply tax law to partnerships and utilize that knowledge to prepare partnership tax returns.
 - * Analyze the tax ramifications of partnership formation and dissolution.
 - * Interpret and apply corporation tax laws and utilize that knowledge to prepare corporation tax returns.
 - * Analyze tax scenarios and apply tax planning concepts to ensure the appropriate tax advice is given to clients.
 - * Identify the differences between federal and state tax laws and how these differences affect tax planning.
 - * Interpret and apply state tax deductions, credits, additions, and subtractions and prepare state income tax returns.
- Prerequisite(s): ACCT2230. (2 C: 2 lect/pres, 0 lab, 0 other)

ACCT 2234 - Auditing

This course is designed to provide students with an understanding of audit objectives and standards. An audit is an examination of financial statements to determine accuracy and to add credibility to the financial statements. Standards, ethics, and legal responsibilities of the public accounting profession, as well as preparation of audit reports and a simulated audit project are emphasized.

Student Learning Outcomes:

- * Illustrate an understanding of the public accounting profession and the ethical and legal responsibilities of a public accountant.
 - * Analyze and explain the process involved in evaluating and selecting audit clients.
 - * Understand and apply the generally accepted auditing standards that are required to perform a successful audit.
 - * Demonstrate an understanding of the various audit reports that may be filed at the completion of the audit, and prepare audit reports based on the audit findings.
 - * Evaluate, design, and perform specific audit procedures on financial statements within a simulated audit project.
- Prerequisite(s): ACCT2226.
(3 C: 2 lect/pres, 1 lab, 0 other)

ACCT 2235 - Accounting Comprehensive Review

The course serves as a capstone course covering financial accounting, ethics, business consulting, managerial accounting, business law and taxation. It is also designed to prepare the student for the Comprehensive Examination for Accredi-

tation in Accountancy, as offered by the Accreditation Council for Accountancy and Taxation.

Student Learning Outcomes:

- * Demonstrate an understanding of financial accounting and financial statement preparation, presentation and reporting
 - * Describe accounting compilation standards
 - * Describe professional ethics as they relate to the accounting profession
 - * Describe business law concepts
 - * Explain the factors involved in business consulting
 - * Apply and explain the rules of federal taxation
 - * Prepare to successfully complete the comprehensive examination for accreditation in accountancy
- (2 C: 2 lect/pres, 0 lab, 0 other)

ACCT 2236 - Government and Not-Profit Accounting

There are over one million tax-exempt organizations in the U.S. today and more than 100,000 accountants who work for the state and local government. This course is a study of the application of the unique fund accounting principles and procedures that apply to these governmental entities and not for profit organizations. An emphasis is given to the application of recording and reporting the economic information of these organizations. The differentiation from corporate financial reporting standards and regulatory bodies are noted.

Student Learning Outcomes:

- * Apply the business concepts of not-for-profit accounting, the implications of not ownership interest or profit motive and the effect on the accounting procedures.
- * Compare the results and requirements of resource flow versus profit based financial statements.
- * Identify restricted, temporarily restricted and unrestricted contributions and net assets, and the impact on the assets of the organization.
- * Record not-for-profit accounting transactions.
- * Prepare basic not-for-profit and government financial statements.
- * Describe the purpose of different governmental accounting funds to ensure proper classification of financial transactions.
- * Record government transactions for appropriations, encumbrances, expenditures, estimated revenues, and actual revenues.
- * Classify government funds as governmental, fiduciary, or proprietary to determine correct basis of accounting.
- * Correctly identify government fund balances as nonspendable, restricted, committed, assigned, and unassigned.

Prerequisite(s): ACCT1215.

(2 C: 1 lect/pres, 1 lab, 0 other)

ADMS 1203 - Microsoft Software in Business I

This course will introduce the intermediate features of Microsoft Office. Students will build on their foundation of basic skills learned in earlier courses to develop strategies for determining best application use. This course will teach students steps to effectively and efficiently use Microsoft software for a variety of business needs. Students will increase their keying speed to 50+ GWAM.

Student Learning Outcomes:

- * Prepare letters, tables, memos, and reports in acceptable format using the Microsoft Office Suite.
 - * Apply appropriate formatting features when creating documents.
 - * Employ practices for managing and filtering postal mail and email.
 - * Schedule appointments, request meetings, and filter incoming messages.
 - * Develop charts to meet audience request.
 - * Prepare reports containing bulleted and numbered lists, footnotes and endnotes, and columnar formatting using word processing software.
 - * Employ features to automatically update chart and content from the internet.
 - * Adopt practice of creating, sorting, and querying tables.
 - * Demonstrate knowledge and understanding of form and report creation.
 - * Use macros, switchboards, PivotTables, and PivotCharts to produce easily accessible and retrievable reports.
 - * Employ graphics and word art features to create professional newsletters.
 - * Create data sources to set up mail merge.
 - * Demonstrate mail merging techniques.
 - * Build keyboard speed and accuracy techniques to 50+ gwam with 95% accuracy.
 - * Learn proofreading, editing and revising skills.
- (3 C: 3 lect/pres, 0 lab, 0 other)

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ADMS 1204 - Microsoft Software in Business II

This course will expand upon MS software applications previously learned. Students will leverage integration features of Microsoft Office applications to solve office problems, needs, and requirements. Students will apply their advanced skills of Microsoft Office to real-world business scenarios and cases to develop and refine problem-solving and communication competencies vital in today's workplace.

Student Learning Outcomes:

- * Manipulate and create Word settings to meet business needs.
- * Devise advanced Excel formulas for creating and maintain significant, easy to digest, data for diverse audiences.
- * Construct financial and logical functions in Excel to calculate office expenses, costs, and earnings.
- * Integrate internet research into easily digested Excel worksheets, charts, and graphs to aid in audience understanding.
- * Combine Excel functions to link to outside sources and calculate presentation data.
- * Formulate advanced Access functions to create and maintain significant, easy to digest, data.
- * Formulate analysis techniques to differentiate and assign data in Access to create specialized reports to aid in audience understanding.
- * Synthesize and link data imported from external sources into Access documents to create and maintain continual updates.
- * Integrate data from Word, Excel, Access, and Outlook.
- * Refine proofreading, editing, and revising techniques.
- * Practice business communication skills.
- * Prioritize workload to accomplish goals and meet deadlines.
- * Develop plans that utilize office management skills to produce quality solutions.

Prerequisite(s): ADMS1203.

(3 C: 3 lect/pres, 0 lab, 0 other)

ADMS 1206 - Keyboard Speedbuilding

This course is designed for students to improve their keying speed and accuracy to industry standards through personal goal setting and intensive keying work.

Student Learning Outcomes:

- * Improve keying speed and accuracy
- * Build keying confidence and skills by further developing posture, touch, and rhythm techniques
- * Create quality keying in five minutes with 0-2 errors

(1 C: 0 lect/pres, 1 lab, 0 other)

ADMS 1207 - Administrative Office Procedures

This course is designed to develop effective work techniques and methodologies in the office environment. Students will be introduced to the rules, procedures, and processes that will develop their skills as an office professional. The course will also cover competency in basic filing, including ARMA rules, alphabetic, numeric, and geographic systems.

Student Learning Outcomes:

- * Identify the roles and responsibilities of the administrative professional.
- * Learn and develop skills and qualities necessary for administrative professionals.
- * Develop competency in filing systems, file management, office organization, mail, and related support software systems.
- * Utilize technology to support the role of the administrative professional.
- * Practice techniques and strategies to provide quality service to internal and external office customers.
- * Practice effective techniques used to manage time, workload, scheduling, and office communications.
- * Discuss the importance of ethical behavior in the workplace.
- * Apply ARMA filing rules to set up and manage correspondence folders for easy retrieval.
- * Understand administrative duties for meetings, conferences, and travel arrangements.

Corequisite(s): ADMS1202

(3 C: 3 lect/pres, 0 lab, 0 other)

ADMS 1208 - Administrative Support Applications

This course uses hands-on projects that represent the complex day-to-day skills and activities necessary to successfully manage in an office environment. Stu-

dents will develop valuable skills required in the workplace, including human relations and communication skills to effective planning, organizing, prioritization and evaluative skills, and system improvement. A variety of office administrative tasks involving the use of transcription equipment, advanced word processing, database, and spreadsheets functions will be performed to replicate today's office place.

Student Learning Outcomes:

- * Identify various dictation and transcription packages available to meet office needs.
- * Utilize available technologies to support communication in the workplace.
- * Create and coordinate travel, event, and office scheduling.
- * Create template documents, databases, and spreadsheets for standard office communications.
- * Develop researching and reporting skills by using reference materials and the Internet.
- * Exercise time management skills to prioritize and manage tasks in a work environment.
- * Provide customer service and support to internal and external customers.
- * Establish priorities and intents of projects, decisions and actions to be taken, including identification of potential opportunities and solutions.
- * Develop administrative procedures to run the office efficiently including the evaluation of existing systems, processes and procedures and suggestions and ideas for improvement and implementation.
- * Generate reports, materials and key correspondence in response to supervisor and customer needs and requests for information.
- * Develop and practice effective human relations and communication skills.
- * Discuss soft skills necessary to the office environment.
- * Apply proof-reading and editing skills to refine office documents.

(3 C: 3 lect/pres, 0 lab, 0 other)

ADMS 1210 - AAS Practicum

This course is completed in preparation to ADMS 2210 - Internship. The student will learn, understand, and gain experience in a variety of Administrative Support. Students will learn expectations of interns in various settings and will confirm that opportunities in their program match their career goals.

Student Learning Outcomes:

- * Gain experiences in differing areas of Administrative Support through short internships, speakers, research, and presentations
- * Understand differences between the Administrative Support divisions of general, legal, and medical
- * Gain experience and reflect on internship experience
- * Grow and develop as a pre-professional persona
- * Learn office expectations in various settings
- * Prepare for full AAS internships by discussing goals and roles
- * Ensure that current academic program aligns with student goals

(2 C: 1 lect/pres, 1 lab, 0 other)

ADMS 1215 - Bookkeeping for Non-Accountants

This course focuses on introducing students to the language of business finance for managers and assistants. Both the how and why of financial practices are blended to provide students with the foundation to manage a business' finances. Students will also be given instruction relating to and have the opportunity to work with online business finance tools.

Student Learning Outcomes:

- * Define basic bookkeeping terms.
- * Demonstrate bookkeeping processes and basic equations.
- * Enter debits and credits.
- * Prepare journal entries.
- * Create ledgers and vendor/customer accounts.
- * Apply computerized bookkeeping functions.

Prerequisite(s): BUSM1260.

(2 C: 2 lect/pres, 0 lab, 0 other)

ADMS 2211 - Administrative Support AAS Internship

This course emphasizes interaction between the student and internship site with emphasis on putting what has been learned in the classroom into practice. The internship program will be available to ADMS students who have demonstrated readiness and willingness to learn in an on-the-job situation. Students will learn from hands-on training and business examples to gain general knowledge of

day-to-day office procedures. This is a capstone course and should be completed during the student's final year. Students must have a cumulative GPA of 2.5 or greater.

Student Learning Outcomes:

- * Willingly accept responsibility for administrative support job functions and personal behavior while at the internship site to help prepare students for future career and professional growth
- * Consistently apply policies and procedures in compliance with regulations of the facility
- * Promote and demonstrate ethical standards of practice
- * Maintain the accuracy and completeness of internship site's records
- * Work on quality improvement projects with minimal supervision
- * Work with a variety of customers - internal and external - to prepare for customer service at future career
- * Work within the team environment while at the internship site to develop comfort in workplace teams and possible confrontations
- * Prioritize job functions and activities with minimal supervision
- * Contribute to work policies and procedures in relation to job function while at internship site
- * Consistently project good company image while assisting customers via telephone
- * Perform most job functions with little or no supervision

Prerequisite(s): ADMS2240.

(3 C: 0 lect/pres, 0 lab, 3 other)

ADMS 2214 - Digital Publications

Students will develop digital communication skills to support work in a professional office environment. These digital communications will support employer needs and enhance internal and external business communications with a variety of stakeholders. This course provides comprehensive coverage software, delivery method, tools, techniques, and methodologies that develop and enhance the skills necessary to effectively and efficiently work in an office environment.

Student Learning Outcomes:

- * Format and present information in a professional manner in a variety of formats
- * Create digital documents to meet a variety of business needs using techniques and tools that meet audience requirements
- * Demonstrate creative design techniques in print and electronic delivery
- * Edit content in a variety of publications and business communications for grammar, sentence structure, spelling, and clarity
- * Create flyers, brochures, newsletters, posters and other publications using a variety of tools and techniques
- * Create, view, edit different types of digital communications
- * Create, maintain, update, and redesign web pages using several different applications

Prerequisite(s): CPTR1210.

(3 C: 2 lect/pres, 1 lab, 0 other)

ADMS 2240 - Administrative Office Management and Supervision

This course introduces current management principles, concepts, and organizational trends, acknowledging that it is everyone's job to manage office information systems, from the top executive to the receptionist. This course will provide strong, management-based background using a humanistic approach for managing and supervising staff in an office environment. This course will also include managing human resources in the office, working with groups and teams, managing essential administrative services, and managing workplace systems and technology. In addition, students will be introduced to operating their own Virtual Assistant business.

Student Learning Outcomes:

- * Design, implement, and maintain relevant organizational activities that are designed to maximize individual and unit productivity
- * Practice management strategies to provide effective management of the organization's information
- * Develop and implement effective work processes and procedures to help employees maintain a high level of work efficacy
- * Provide a satisfactory physical and mental working environment for the organization's employees to ensure employee retention and satisfaction
- * Define duties and responsibilities of employees assigned within the administrative office management functional area to help employees understand role in organization

* Develop satisfactory lines of communication among employees within the administrative office management functional area and between the employees in other areas within the organization to ensure questions and concerns are answered quickly and correctly

* Establish methods for effective supervision of office personnel to maintain a successful and productive workplace

* Recommend the availability, efficiency, and proper use of specialized office equipment to ensure equipment needs meets employees and organization needs

* Learn duties and business concepts of the Virtual Assistant profession to provide students another career opportunity

Prerequisite(s): ADMS1202, ADMS1208, CPTR1210.

(3 C: 3 lect/pres, 0 lab, 0 other)

ADVR 1244 - Multimedia for Web Design

In this course students will analyze and implement the process of creating and designing rich media for the web using Adobe Flash. Students will incorporate a variety of multimedia components to create and produce banner ad design. Also students will become familiar with the use of Flash in multimedia design such as video production and electronic brochures. Conceptualization, storyboarding and the production process will be covered to prepare students.

In addition students will learn new approaches to animation on the web with the use of technologies such as CSS3, HTML5 and Javascript. Students will develop an understanding of current rich media design/production processes.

Student Learning Outcomes:

- * Use the multimedia application environment to explore drawing, typography and multimedia editing and integration.
- * Effectively use layers and library panels to organize and improve workflow.
- * Create simple and complex animations using common animation techniques, such as motion tweening, shape tweening, and Actionscript.
- * Use Actionscript to add advanced interactivity to multimedia projects.
- * Design and create banner ads, electronic brochures and video clips.
- * Interpret new approaches to create animation on the web.
- * Create background animations for websites using CSS animation.
- * Design animated and responsive navigation of web.
- * Demonstrate how to integrate projects with various web and multimedia techniques.
- * Present ideas professionally using visual, oral and presentation skills.

(4 C: 3 lect/pres, 1 lab, 0 other)

ADVR 2206 - Ad-Ventures

Students will be exposed to advertising avenues critical to creating strong advertising and design. Problem solving skills will be used as students learn to trust their creative and artistic instincts and develop a visual vocabulary of their own using a variety of techniques and materials. The main focus of the course is on experimentation, exploring creativity and brainstorming. Advertising trends are also identified and discussed, and time management skills are developed.

Student Learning Outcomes:

- * Create unique concepts and solutions to advertising problems
- * Explain the importance of creativity to advertising and design
- * Develop strategies for creative thinking beyond conventional boundaries for professional designers
- * Demonstrate ability to brainstorm and problem solve individually and in group settings
- * Develop, research, design, produce and present a creative advertising campaign
- * Identify current and future advertising trends
- * Exhibit proficient organizational and time management skills

(2 C: 2 lect/pres, 0 lab, 0 other)

ADVR 2245 - Fundamentals of Dynamic Websites

Many database-driven websites, web applications and content management systems are designed and developed in PHP. Students in this course will build foundational PHP programming skills to create and modify PHP-based web applications that integrate with other web technologies. These skills will enable students to write powerful queries that perform complicated searches and sorts on data. During the course, students will develop and construct a complete content management system, to include creation of a complete website capable of dynamically displaying data from a MySQL database.

Student Learning Outcomes:

- * Build professional-quality, database-driven websites using open source soft-

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ware, PHP and MySQL.

- * Develop interactive websites with authentication and security by integrating PHP with HTML and CSS.
 - * Apply basic and advanced object-oriented programming techniques, use libraries and frameworks, develop advanced database connectivity techniques, and integrate PHP with other web technologies to build secure e-commerce applications.
 - * Design, create and edit database tables
 - * Construct a MySQL database.
 - * Learn LAMP server fundamental and setup a LAMP server to host a PHP based website.
 - * Build a knowledge foundation in Structured Query Language (SQL) to properly retrieve and edit information stored on a database.
 - * Create an interactive website that can post and retrieve information.
 - * Present ideas professionally using visual, oral and written communication skills.
- (3 C: 2 lect/pres, 1 lab, 0 other)

ADVR 2248 - Website Content Management Systems

This course is designed to instruct students in all aspects of dynamic website creation and management using a Content Management System (CMS). This will include designing, installation, management, and maintenance of websites based on a CMS. This course guides students in developing necessary skills to complete a finished CMS based blog/website while learning how to make decisions to meet client CMS needs.

Student Learning Outcomes:

- * Learn foundational components of a Content Management System including functional knowledge and pros and cons of using a CMS.
- * Create a CMS based blog and website.
- * Manage text, image and page content through a back end interface.
- * Apply information architecture techniques to aid in content development and management.
- * Design and implement custom themes.
- * Select appropriate plugins and components to add required functionality.
- * Troubleshoot and publish a complete website.
- * Maintain and secure CMS based websites.
- * Install, migrate and update CMSs.

Prerequisite(s): ADWD1245.

(3 C: 2 lect/pres, 1 lab, 0 other)

ADVR 2281 - Broadcast

Students will study commercial construction as it relates to the radio and television broadcast industry. Lessons will be covered using the Official Finalcut Pro Training Manual. They will also receive technical instruction in the Finalcut Pro multimedia software and create radio and television commercials suitable for portfolio presentation.

Student Learning Outcomes:

- * Research the history of the television and radio production process in the US
 - * Gain advanced knowledge in the areas of broadcast research and design
 - * Develop an understanding of the commercial creation/production process
 - * Produce radio and television commercials indicative of the advertising industry
 - * Differentiate between fair use and the need for permission in the media industry
- Prerequisite(s): ADVR1200, ADVR1221, ADVR1230.

(4 C: 2 lect/pres, 2 lab, 0 other)

ANTH 1300 - Introduction to Cultural Anthropology

Meets MN Transfer Goals 5 and 8 - History/Social, Behavioral Sciences and Global Perspective. Students will be introduced to Anthropology as a social science with a particular focus on the subfield of Cultural Anthropology and the diversity of the human experience. They will apply methods and concepts from Cultural Anthropology in analysis of their own culture, specific cultures new to our country and other world cultures using ethnographic accounts. An emphasis will be placed on ways this knowledge and the related skills that are learned in this course are useful for self-understanding and for addressing social issues.

Student Learning Outcomes:

- * Use anthropological methods to describe students' own and other cultures.
- * Accurately apply course concepts in analysis and description of students' own and other cultures.
- * Explain the usefulness of anthropological knowledge and methods for resolving

social problems.

- * Compare and contrast different cultural patterns of subsistence and economics, marriage and family, gender and social stratification, social control, religion and art.
 - * Describe different aspects of culture and the ways cultures are affected by change.
 - * Identify connections between various aspects of culture.
 - * Illustrate the integrated nature of culture using specific examples from students' own and other cultures.
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

ANTH 2300 - Anthropology of Science Fiction

Meets MN Transfer Goal Areas 5 and 8 - History and the Social and Behavioral Sciences and Global Perspective. Basic concepts of anthropology will be used to interpret the imaginary worlds of science fiction. Fictional cultures will be examined to see how features of human biology, language, social organization, technology, etc. are patterned after or different from known human cultures. Anthropology and science fiction will then provide a framework for students to deepen their understanding of themselves, our contemporary culture and current world issues.

Student Learning Outcomes:

- * Understand the historical and cultural context to Anthropology as a discipline
- * Understand the historical and cultural context of Science Fiction as a genre and its use as cultural commentary
- * Apply anthropological concepts, theories and methods to analyze science fiction "cultures"
- * Understand and be able to explain how the various aspects of a culture are integrated
- * Draw parallels between science fiction and current world issues

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.

(3 C: 3 lect/pres, 0 lab, 0 other)

ARCH 1503 - Introduction to Architectural Drafting

This course introduces the fundamentals of the Architectural Drafting process. It explores the importance of drafting, the required tools and equipment, and the production of orthographic and isometric drawings.

Student Learning Outcomes:

- * Explore building materials and construction methods
- * Apply architectural drafting skills including plans, elevations and sections
- * Illustrate techniques of architectural drafting including line quality, lettering, dimensioning and symbols.
- * Produce plans, sections, and elevations of a simple building.
- * Explore building codes and construction methods
- * Develop drafting skills through projects utilizing basic residential construction methods and their graphical representation.

Corequisite(s): CNST1502

(2 C: 1 lect/pres, 1 lab, 0 other)

ARCH 1506 - Intro to Architectural CAD

This course will introduce AutoCAD software as a design and drafting tool for Architecture. The student will work with AutoCAD software to create drawings and learn the tools of cad. Concepts include organizing, editing, drawing skills, printing/plotting, adding text and dimensions.

Student Learning Outcomes:

- * Demonstrate AutoCAD basic commands
 - * Perform multiple draw functions
 - * Implement modify commands
 - * Apply annotation and dimensioning
 - * Manipulate documents to perform printing and plotting functions
- (3 C: 1 lect/pres, 2 lab, 0 other)

ARCH 1510 - CAD and Design Studio

This course will give the capacity to use drafting systems to develop sales presentations, details, sections and construction plans for a two-story house.

Student Learning Outcomes:

- * Develop drafting skills including sketching of floor plans, sections and elevations

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* Complete a full set of CAD drawings for the construction of the home
Corequisite(s): ARCH1534
Prerequisite(s): ARCH1502, ARCH1506.
(6 C: 2 lect/pres, 4 lab, 0 other)

ARCH 1522 - Residential Design Principles

Study of residential spaces including identification of client needs, industry standards, and space planning concepts.

Student Learning Outcomes:

- * Examine and identify the living, sleeping and service areas of a home
- * Analyze traffic flow
- * Recognize styles of kitchen design
- * Create individual kitchen designs based on project criteria
- * Recognize elements of bathroom layout
- * Create individual bathroom designs based on project criteria
- * Identify the space requirements for living and dining areas
- * Outline the space requirements for bedrooms and closets
- * Analyze the space requirements for garages and exterior living spaces.

(2 C: 2 lect/pres, 0 lab, 0 other)

ARCH 1534 - Residential Design and Presentation

Students will learn different architectural history of house styles, remodeling design, pencil and colored rendering and to help build on good principles of design. Student will also learn oral and written communication to help them present their projects.

Student Learning Outcomes:

- * Examine and identify the exterior design elements of housing styles
- * Examine ways to change the style of a home during a remodeling project
- * Examine the elements of various kinds of presentation drawings
- * Prepare enhanced front elevations, perspectives, and 3D floor plans
- * Prepare and deliver an oral presentation

Prerequisite(s): ARCH1522.

(2 C: 2 lect/pres, 0 lab, 0 other)

ARCH 2504 - Introduction to Google SketchUp

To meet the demands of industry and education for a fast, accurate, and inexpensive software to create 3D objects Google has created "Google SketchUp". Developed for the conceptual stages of design, this program is powerful and easy to learn. In short, it is designed to simplify and streamline the 3D design process. SketchUp is used by many designers to quickly create three dimensional concepts and colorful renditions.

In this introduction to SketchUp students will master basic skills by creating a 3D building complete with doors, windows, stairs and interior components. While SketchUp is suited to any type of 3D modeling, the emphasis in this course will be on construction and architectural applications.

Student Learning Outcomes:

- * Use SketchUp to model basic architectural projects
- * Create architectural shapes and objects using the three-dimensional tools provided by the program
- * Select and produce various viewing styles and understand how they affect the communication between client and designer
- * Utilize preferences, layers, components, materials and other tools to organize data within each project
- * Print out drawings using various output options provided by the program
- * Demonstrate an understanding of how SketchUp can import and export files to and from other applications, such as Google Earth and AutoCAD

(1 C: 0 lect/pres, 1 lab, 0 other)

ARCH 2506 - Architectural Design Studio I

This course is an introduction to light commercial drafting procedures. Students will develop working drawings for a small commercial building utilizing pole frame, slab on grade construction. Details will also be developed for a commercial building utilizing masonry wall systems. Emphasis is placed on drawing details that meet ADA requirements. Other topics include hand sketching, shop drawings, commercial detailing, and sectioning principles.

Student Learning Outcomes:

- * Determine and list preliminary design solutions for a small convenience store

* Draw working drawings for a convenience store utilizing pole frame construction

* Determine and list preliminary design solutions for a small strip mall project

* Draw working drawings for a strip mall project utilizing masonry construction
Prerequisite(s): ARCH1503.

(3 C: 1 lect/pres, 2 lab, 0 other)

ARCH 2510 - Architectural CAD II

This course will enable students to use their knowledge of construction materials, systems and practices by drafting the working drawings of a split-level home or twin home. Students will use AutoCAD software to produce the documents necessary for industry standard communication and construction.

Student Learning Outcomes:

- * Determine space requirements for a split-level duplex based on project requirements
- * Develop preliminary floor plans for a split-level duplex building based on project requirements
- * Select appropriate materials and structural systems for a split-level house
- * Draw working drawings for a split-level duplex (floor plan, fdn. plan, elevations, sections, door and window schedules, misc. details, site plan and appropriate construction notes) using AutoCad software
- * Print and/or plot working drawings using appropriate scale, line weights and paper size

Corequisite(s): ARCH2522, ARCH2530

Prerequisite(s): ARCH1506.

(3 C: 1 lect/pres, 2 lab, 0 other)

ARCH 2518 - Architectural CAD III

This course enables the student to draft the complete working drawings of a commercial remodeling project and a small commercial building using AutoCAD software. The student will select the appropriate building materials and systems to demonstrate their construction knowledge and understanding of project design requirements.

Student Learning Outcomes:

- * Determine demolition and remodeled space requirements based on existing floor plans and project requirements
- * Draw remodeled floor plans, elevations and details using AutoCad software
- * Develop preliminary floor plans for a small commercial building based on project requirements
- * Select appropriate materials and structural systems for a small commercial building
- * Draw working drawings for a small commercial building (floor plan, fdn. plan, elevations, sections, door and window schedules, misc details, site plan and appropriate construction notes) using AutoCad software
- * Print and/or plot working drawings using appropriate scale, line weights and paper size

Prerequisite(s): ARCH2510, ARCH2506.

(3 C: 1 lect/pres, 2 lab, 0 other)

ARCH 2522 - Commercial Design Principles and Practice

This course is designed to provide students the principles of design as they apply to multi-family housing and light commercial construction. Topics of study will include aesthetics, building accessibility requirements for ADA (Americans with Disabilities Act), system selections, durability and selected fire and life-safety provisions of the IBC and IRC building codes. Students will study commercial design by reading and analyzing blueprints, specifications and bidding documents from actual commercial projects. Emphasis is placed on reading and understanding commercial working drawings.

Student Learning Outcomes:

- * Access and analyze accessibility requirements of the Americans with Disability Act
- * Apply ADA to commercial building design.
- * Draw details for commercial toilet rooms that meet Minnesota Code and ADA requirements.
- * Develop and draw basic layouts for units in multi-family construction utilizing fire, sound, and other building code requirements.
- * Define and analyze basic design requirements for merchandising facilities.
- * Identify and interpret structural, architectural, mechanical and civil drawings for commercial projects

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

* Analyze project manuals for small commercial buildings.
* Demonstrate an understanding of the CSI format.
Prerequisite(s): CNST1502.
(2 C: 1 lect/pres, 1 lab, 0 other)

ARCH 2530 - Sustainable Building Systems

This course will introduce students to the concepts and applications of sustainable building design and construction. Specific areas of study include principles of thermal-dynamics as they apply to building envelopes and the utilization of solar, wind, bio-mass, geo-thermal and fossil fuels to create energy for buildings. Historic and current approaches to sustainable building design will be reviewed as well as systems used to evaluate environmentally appropriate structures.

Student Learning Outcomes:

- * Identify selected models for sustainable design.
- * Develop a definition of sustainable design based on established models.
- * Demonstrate an understanding of thermal dynamics by utilizing software to measure building energy efficiency.
- * Specify R-values for fiberglass, loose fill and rigid insulation types for various building applications.
- * List current applications of solar, wind, bio-mass, geo-thermal and fossil fuels used in buildings.
- * Identify basic mechanical building systems on commercial plans.
- * Develop a sustainable design vocabulary based on industry terminology.
- * Evaluate projects using the LEED Rating system.

(2 C: 2 lect/pres, 0 lab, 0 other)

ARCH 2542 - Structural Building Systems

Statics and strengths of construction materials are presented. Structural and architectural elements in soil mechanics, structural wood, concrete, steel, pre-stressed and post tensioned concrete are the primary emphasis. Students will develop skills in using basic structural formulae and procedures. Students will also learn procedures for producing shop drawings for various materials.

Student Learning Outcomes:

A student successfully completing this course will:

- * Calculate footing sizes using building loads and soil bearing data.
- * Identify details for pre-cast, pre-stressed concrete products.
- * Create construction details for various methods of commercial construction projects
- * Identify procedures used in Cast-in-place concrete.
- * Recognize basic steel shapes and calculate W and S shaped beam sizes using building loads and load charts.
- * Classify solid sawn lumber sizes and calculate beam sizes using building loads and WWSA span calculator.
- * Identify engineered wood products (I-joist, LVL, PSL, roof and floor trusses.)
- * Calculate sizes for various engineered lumber products using building loads.

Prerequisite(s): CNST1506.

(3 C: 1 lect/pres, 2 lab, 0 other)

ARCH 2551 - Professional Constructor Seminar

This course will enable students to prepare a resume, letters of application, and a personal portfolio. Students will study interviewing techniques and job seeking skills.

Student Learning Outcomes:

A student successfully completing this course will:

- * Assess career opportunities and determine employment objectives.
- * Select a resume format and prepare a personal resume
- * Prepare a job application letter.
- * Identify and present interviewing techniques.
- * Identify and assemble a personal portfolio of student work.

(1 C: 1 lect/pres, 0 lab, 0 other)

ART 1300 - Art Appreciation

Meets MN Transfer Curriculum Goal Area 6 - This course is an introduction to the basic concepts of the visual arts. Students will be introduced to the processes, principles, and purposes of visual art in historical context and will explore the effect of art on our lives. Students will learn the language of the visual arts, will learn about the media of the visual arts, and will learn to evaluate artists work. Additionally, students will understand interpretations of and context for artworks

throughout the continuum of art history. Activities will include text reading, slide lectures, films, and museum/gallery tours.

Student Learning Outcomes:

- * Demonstrate an awareness of the variety of visual art forms and art works.
- * Demonstrate an understanding that artworks are expressions of values within a historical and social context.
- * Demonstrate the ability to respond critically to works of visual art.
- * Articulate informed responses to works of visual arts throughout the continuum of art history.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.

(3 C: 3 lect/pres, 0 lab, 0 other)

ART 1310 - 2D Design

Meets MN Transfer Curriculum Goal Area 6 - Humanities. This course introduces the vocabulary and tools essential for two-dimensional image creation. This course develops a working knowledge of the use of the basic elements and principles of two-dimensional design. Students will explore creative problem solving by producing design projects in a variety of tools, techniques, and materials. This course emphasizes the elements, principles, and ideas that constitute the shared language of all visual arts. Production and research will be an integral part of the course as students learn to apply the elements and principles of design to artistic projects.

Student Learning Outcomes:

- * Identify and explain the elements and principles of two-dimensional design.
- * Apply the elements and principles of two-dimensional design in a variety of assigned creative projects, including non-objective, abstract, representational, and typographic compositions.
- * Create and explain original designs that solve a variety of formal problems.
- * Show basic technical proficiency in the media introduced in class.
- * Respond critically to works of visual arts and design using the language of art and design, both verbally and in writing.
- * Evaluate works of art and design, both formally and conceptually.
- * Explore form and content and their relationship via hands-on creative projects.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.

(4 C: 3 lect/pres, 1 lab, 0 other)

ART 1321 - Drawing I

Meets MN Transfer Goal Area 6 - Humanities/Fine Art. This course introduces students to the basic elements drawing. Students will experiment with a variety of techniques, styles and media, while developing perceptual awareness, eye/hand coordination, and an increased appreciation of art.

Student Learning Outcomes:

- * Develop skills and proficiencies necessary to those working with drawing media
- * Examine technical, aesthetic, and design issues inherent in drawing
- * Engage in the creative process
- * Develop an appreciation for the aesthetic principles governing works in drawing
- * Make aesthetic judgments appropriate to drawing, respond critically to works, and articulate informed personal reactions to works in the arts.
- * Formulate ideas and develop strategies to give them formal expression using drawing
- * Employ drawing as a means of personal expression

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.

(4 C: 3 lect/pres, 1 lab, 0 other)

ART 1330 - Painting I

Meets MN Transfer Curriculum Goal Area 6 Humanities - This course introduces the technical, conceptual, and aesthetic aspects of painting using acrylic paints. Students will explore basic problems of color, form, and composition using traditional and contemporary methods. Students will engage in the creative process and informed personal reaction and critical response to both historical and class works will be fostered.

Student Learning Outcomes:

- * Demonstrate the ability to render forms and space from observation onto the two-dimensional surface.
- * Show basic technical proficiency in the use of acrylic painting media.
- * Solve visual problems creatively while demonstrating an awareness of cultural and/or historical precedent.

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

- * Show proficiency with diverse painting styles.
 - * Demonstrate an awareness of composition, value, color, mark-making, and texture.
 - * Employ painting as a means of personal expression while developing ability with the media.
 - * Critically respond verbally and in writing to both the paintings of their peers and to works drawn from the history of art.
 - * Evaluate their own artworks, both formally and conceptually.
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(4 C: 3 lect/pres, 1 lab, 0 other)

ART 1340 - Digital Photography

Meets MN Transfer Curriculum Goal Area 6 - Humanities. This course is an introduction to photography as a creative medium and focuses on the production of photographs. The digital camera is used as a means for individual creative expression. The emphasis in this course is on aesthetic, technical, conceptual, and historical concerns in photography. A wide range of topics will be covered including creative expression, visual composition, and the history of photography as a creative medium. Production and research will be an integral part of the course as students learn to apply artistic principles to photography.

Student Learning Outcomes:

- * Identify, explain, and demonstrate the ability to perform basic camera and computer functions.
 - * Show basic technical proficiency in the digital photographic medium.
 - * Apply the elements and principles of art, design, and photographic structure in a variety of assigned creative projects including portraiture, landscape, and still life.
 - * Create original photographs that address a variety of formal and conceptual problems and photographic applications.
 - * Explain one's own aesthetic, conceptual, and technical decision making processes as they relate to creative projects in digital photography.
 - * Articulate a personal, critical response to technical and aesthetic concerns when viewing photographs.
 - * Form and articulate a timeline that includes significant milestones in photography and key photographers and photographs which illustrate these periods.
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(4 C: 3 lect/pres, 1 lab, 0 other)

ASTR 1300 - Astronomy

Meets MN Transfer Goal 3 - Natural Sciences. This is an introductory astronomy course designed for non-science majors. This course presents astronomy in a cosmic context. The course starts with an overview of the evolving universe that is used during the entire course to develop an integrated understanding of astronomy and an appreciation for science. This course emphasizes key physical concepts that enable students to understand how science can explain the phenomena they see in their daily lives and how these are connected to the processes that govern the cosmos. Topics include our emerging understanding of galaxy evolution, starbursts, quasars, intergalactic clouds and dark matter. In addition, we compare each of the planets to develop a deeper understanding of our solar system, our own world, our relationship to the cosmos and the prospects for life elsewhere in the universe.

Student Learning Outcomes:

- * Describe the physical processes that affect, create, and destroy objects in the universe
- * Explain the evolution of the currently known astronomical objects and phenomena in the universe
- * Explain astronomical events in the sky in terms of astronomical processes
- * Explain the similarities and differences between the planets in our solar system, the origin of the planets, and how the planets relate to the cosmos
- * Describe how scientists develop theories, collect and analyze data and arrive at scientific conclusions
- * Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments
- * Demonstrate and apply critical thinking skills to analyze a variety of phenomena
- * Work cooperatively and effectively in groups engaged in the process of science and show respect for other people's needs, ideas and feelings
- * Model professional and responsible behavior by being on time, participating in class discussions and completing assignments on time

- * Demonstrate effective use of resources including faculty, other students, reference materials, industry sources, and the Internet
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

ASTR 1301 - Astronomy Lab

Meets MN Transfer Goal 3 - Natural Sciences. Learn about constellations, stars, telescopes, instruments and measurements astronomers make to determine the distances to the stars and more. This is an introductory astronomy lab course designed for non-science majors. It can be taken by itself as a stand-alone course or in conjunction with an Astronomy course. This laboratory course will focus on gaining an understanding of the instruments, observations, measurements, and calculations used by astronomers to determine the properties of celestial objects (planets, stars, clusters, nebulae, galaxies), and the distances to these celestial objects. In this course, you will gain "hands on" experience making real observations (naked eye, binocular, and telescope) and measurements. You will analyze the data from your measurements and observations and draw scientific conclusions from your analysis.

Student Learning Outcomes:

- * Identify major constellations and stars and know how to locate celestial objects
 - * Describe basic scientific theories used in astronomy
 - * Describe how scientists determine the properties of celestial objects such as planets, stars, clusters, nebula, and galaxies
 - * Describe how scientists determine the distances to celestial objects
 - * Describe how scientists develop theories, collect and analyze data and arrive at scientific conclusions
 - * Perform measurements of the properties of celestial objects
 - * Document and discuss experimental results
 - * Gather data from other sources
 - * Analyze data and draw conclusions from this analysis
 - * Use the scientific method to state hypotheses and then test those hypotheses experimentally
 - * Demonstrate and apply critical thinking skills to analyze a variety of astronomical phenomena
 - * Work cooperatively and effectively in groups engaged in the process of science and show respect for other people's needs, ideas, and feelings
 - * Model professional and responsible behavior by being on time, participating in class discussions and completing assignments on time
 - * Demonstrate effective use of resources including faculty, other students, reference materials, industry sources, and the Internet
- (1 C: 0 lect/pres, 1 lab, 0 other)

AUTO 1508 - Automotive Wheel Alignment

Students in this course will study and apply specific geometric angles and their terms as used in four-wheel alignment. Students will become familiar with the latest technologies and equipment used to measure and correct these angles. Steering and suspension system nomenclature and theory of operation will also be discussed, as well as the diagnosis of abnormal tire wear, undesirable handling characteristics, noises, sags and other steering and suspension problems. The focus of this course is understanding and correcting alignment angles, theory and operation of suspension and steering systems and maintenance/repair of suspension and steering systems.

Student Learning Outcomes:

- * Identify and perform safety procedures relating to the automotive repair industry
 - * Become proficient with the latest technologies and equipment used to measure and correct wheel alignment angles
 - * Diagnose and repair abnormal tire wear, undesirable handling characteristics, noises, sags and other steering and suspension problems using processes, tools and equipment consistent with our industry while working at the performance level of an entry level technician
 - * Inspect and maintain all steering and suspension components and systems
 - * Diagnose and repair steering and suspension system problems using processes, tools and equipment consistent with our industry while working at the performance level of entry level technicians
 - * Develop pollution preventive procedures involving lubricants, parts and components of steering and suspension systems and storage, disposal or recycling of tires
- Prerequisite(s): TRAN1502. (4 C: 1 lect/pres, 3 lab, 0 other)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

AUTO 1509 - A6: Automotive Electrical/Electronic Systems

In this course the student will learn the basics of electricity and electronics. The student will study the sources of electricity, circuits, magnetism, resistance, voltage and amperage. Students will learn about diodes, transistors and solid-state devices. Lab work will give the students hands on experience with digital meters, power supplies and oscilloscopes.

This course also covers the operation, service techniques and diagnosis of most types of body electrical components. The student will learn about starter and alternator testing and replacement. The lab work will develop skills in repairing today's high tech accessories.

Student Learning Outcomes:

- * Examine electrical theory
 - * Work safely with electricity
 - * Relate electricity to the vehicle electrical systems
 - * Use electrical test equipment
 - * Develop diagnostic trouble finding skills
 - * Develop understanding of the operation of vehicle electrical components and testing procedures
 - * Examine vehicle body electrical systems and identify problem area
 - * Test and record circuit conditions
 - * Identify failing component
- (4 C: 2 lect/pres, 2 lab, 0 other)

AUTO 1510 - Chassis Electrical

This course covers the operation, service techniques and diagnosis of most types of body electrical components. The student will learn about starter and alternator testing and replacement. The lab work will develop skills in repairing today's high tech accessories.

Student Learning Outcomes:

- * Examine vehicle body electrical systems and identify problem area
- * Test and record circuit conditions
- * Identify failing component
- * Remove and replace failed component
- * Test and repair starting and charging system
- * Repair and diagnose circuit problems
- * Install electrical accessories
- * Perform tests using a multimeter or specialized testers

Prerequisite(s): TRAN1504.

(4 C: 2 lect/pres, 2 lab, 0 other)

AUTO 1512 - Engine Repair Theory

This introductory course covers the principle operation and diagnostic procedures of internal combustion engine mechanical components, including construction, parts identification, engine disassembly and re-assembly procedures as well as turbo, super charger and diesel engine construction and operation. Maintenance schedules and procedures for oil, coolant, water pump, timing belt and serpentine belt will be covered. Students will have real world shop experience by writing electronically formatted repair orders, verifying customer concerns, diagnosing the failure/cause, and understanding how to perform the correction.

Student Learning Outcomes:

- * Examine the procedures on how to remove and install an engine in front or rear wheel drive vehicles.
- * Identify engine components, construction and application
- * Know to assemble an engine including the importance of cleaning gasket material from mating surfaces using correct tools and techniques.
- * Identify abnormal wear, by inspecting and measuring parts; determine the cause and what the preventive action could have been.
- * Interpret customer concerns and verify complaint to determine probable diagnoses of failures.
- * Complete a detailed estimate of failed components, gaskets and fluids needed to complete a repair.
- * Develop a plan of action to remove, repair, or replace worn engine components.
- * Know the importance of following manufacturer installation, torque and sequence specifications on bolts and fasteners, and where to find those specifications.
- * Know the importance of confirming the repair was done correctly and the customers concern was corrected by the repair.

(2 C: 2 lect/pres, 0 lab, 0 other)

AUTO 1514 - Engine Repair Lab

This course gives the students hands-on experience in diagnosing engine mechanical failures through disassembling and reassembling an engine block and cylinder heads. They will identify internal engine parts and perform wear measurements. Students will also diagnose customer concerns on engine mechanical failures such as low compression, abnormal engine noise, and coolant and oil loss on both internal and external components of the engine. Multiple diagnostic methods, tools and equipment will be used. Students will perform many different levels of maintenance to the engine such as oil and coolant flushes, water pump, timing belt, and serpentine belt replacements. Students will also have real world shop experience by filling out electronically formatted repair orders, verifying customer vehicle concerns, diagnosing the failure, performing the repair, and confirming with the customer that their concern has been addressed.

Student Learning Outcomes:

- * Remove and install an engine from vehicle with front or rear wheel drive while following manufactures steps and procedures.
 - * Disassemble and reassemble an engine including removing and cleaning gasket material from mating surfaces using correct tools and techniques.
 - * Identify, measure, and inspect engine parts for wear to determine the cause of a failure, what the correction will be, and what the preventive action could have been.
 - * Verify, diagnose, and repair engine failures using multiple tools and methods.
 - * Prepare a detailed list and estimate of failed components, gaskets, and fluids needed to complete the repair.
 - * Develop a plan of action and remove, repair, or replace worn engine components while following the manufacturers instructions and torque specifications.
 - * Confirm a repair was done correctly and the customers concerns were corrected by the repair.
- (4 C: 0 lect/pres, 4 lab, 0 other)

AUTO 1516 - Brakes

The students will learn the use of brake hydraulic systems. Students will repair disc, drum brakes and power assist units. The operation and repair of antilock brake systems will also be taught.

Student Learning Outcomes:

- * Use asbestos collection equipment
- * Perform brake inspections and determine condition of brake friction material
- * Inspect the condition of brake hoses and lines
- * Perform brake service as needed to restore brake system to proper operation
- * Diagnose brake problems related to noise or improper function of components
- * Test, diagnose and repair anti-lock brake systems

Prerequisite(s): TRAN1502.

(4 C: 1 lect/pres, 3 lab, 0 other)

AUTO 1522 - A8 Engine Performance

Students will develop skills in basic engine performance on gasoline four stroke engines. Lab work consists of typical service, repair and diagnosis procedures on ignition, fuel, emissions and related electrical systems on late model vehicles. Students should be able to describe system operation and perform engine performance and fuel system service in accordance with manufacturer's procedures.

Student Learning Outcomes:

- * Interpret customer/vehicle complaint on late model vehicles
 - * Identify maintenance requirements and various inspection procedures on late model vehicles
 - * Demonstrate job entry skill development when performing basic diagnosis of engine systems
 - * Use 4/5 exhaust gas analyzer
 - * Perform a computerized engine test analysis
 - * Conform to federal OSHA and state MPCA rules as it relates to vehicle service procedures
 - * Be aware of ethical practices as it relates to engine performance service procedures
 - * Exhibit technician/mechanic professionalism
- (4 C: 2 lect/pres, 2 lab, 0 other)

AUTO 1523 - Advanced Chassis Electrical

Students will learn anti-locking brake, supplemental restraint, and tire pressure monitoring systems. Lab work consists of using scan tools for diagnosis and repair on these electronic/mechanical systems on late model vehicles. Students

will learn to describe system operation and perform service in accordance with manufacturer's procedures.

Student Learning Outcomes:

- * Perform inspection and repair procedures on ABS and Supplemental Inflatable Restraints (SIR) systems.
 - * Perform inspection and repair procedures on Tire Pressure Monitor (TPM) systems.
 - * Demonstrate use of generic and factory scanners
 - * Perform basic computer scan diagnosis.
 - * Analyze ABS and body diagnostic trouble codes.
 - * Demonstrate ethical practices as it relates to electrical service procedures.
 - * Exhibit technician/mechanic professionalism.
- Prerequisite(s): TRAN1504, TRAN1516.
(2 C: 1 lect/pres, 1 lab, 0 other)

AUTO 2502 - Engine Ignition and Emission Systems

Students will develop skills in basic engine performance on gasoline four stroke engines. Lab work consists of typical service, repair and diagnosis procedures on ignition, fuel, emissions and related electrical systems on late model vehicles. Students should be able to describe system operation and perform engine performance service in accordance with manufacturer's procedures.

Student Learning Outcomes:

- * Identify maintenance requirements and various inspection procedures on late model vehicles
 - * Demonstrate job entry skills development when performing basic diagnosis of engine systems
 - * Use 4/5 exhaust gas analyzer
 - * Perform a computerized engine test analysis
 - * Conform to federal OSHA and state MPCA rules as it relates to vehicle service procedures
 - * Be aware of ethical practices as it relates to engine performance service procedures
 - * Exhibit technician/mechanic professionalism
- Prerequisite(s): TRAN1502, TRAN1504, TRAN1516.
(4 C: 2 lect/pres, 2 lab, 0 other)

AUTO 2505 - Engine Fuel and Emission Systems

Students will develop skills servicing fuel and emission systems. Lab work consists of diagnosis and repair procedures on fuel, computer, and emission systems on late model vehicles. Students should be able to describe system operation and perform fuel system service in accordance with manufacturer's standards. Students will learn to describe computer and sensor operation and perform computer system service in accordance with manufacturer's procedures. Students will also need to accurately document vehicle information and work performed on repair orders.

Student Learning Outcomes:

- * Demonstrate job entry skill development when performing basic diagnosis of engine systems.
 - * Demonstrate use of a 4/5 exhaust gas analyzer.
 - * Perform computer component service and repairs using scan data.
 - * Perform inspection and repair procedures on fuel systems.
 - * Perform inspection and repair procedures of engine control sensors.
 - * Perform diagnosis and repair of Evaporative Emission Control (EVAP) systems in accordance with manufacture's standards.
 - * Perform diagnosis and repair of Exhaust Gas Recirculation (EGR) systems in accordance with manufacture's standards.
 - * Perform diagnosis and repair of AIR and Positive Crankcase Ventilation (PCV) systems in accordance with manufacture's standards.
 - * Document vehicle data and work performed on repair order.
- Prerequisite(s): TRAN1502, TRAN1504, TRAN1516.
(5 C: 3 lect/pres, 2 lab, 0 other)

AUTO 2506 - Principles of Torque Transfer

How engine torque is transferred to the wheels is the focus of this comprehensive drive train course. Students will learn the theory of torque multiplication and division, applying it to all automotive and light truck applications. Operation, diagnosis and repair of manual transmissions and transaxles, transfer cases, differentials, propeller shafts and front driving axles will be the main topic. This course includes All Wheel Drive and Four Wheel Drive applications. All aspects

of driveline repair on automotive and light truck applications will be practiced, with the exception of automatic transmission and transaxle overhaul.

Student Learning Outcomes:

- * Implement safety procedures in accordance with automotive repair industry standards.
 - * Apply basic principles of torque multiplication and division using gears to the operation and design of manual transmission/transaxles, transfer cases and differentials.
 - * Analyze mechanical and electrical synchronization of two or more components and transfer of torque through constant or variable velocity conveyors.
 - * Diagnose and repair driveline component failures in automotive and light truck applications, including locking hubs and AWD/4WD electronic control systems using processes, tools and equipment consistent with our industry while working at the performance level of an entry level technician.
 - * Perform driveline maintenance procedures on automotive and light truck applications.
 - * Remove, rebuild and replace a manual transmission/transaxle and transfer case. Overhaul a differential.
 - * Practice pollution prevention procedures involving storage, disposal or recycling of fluids and parts.
- Prerequisite(s): TRAN1504, TRAN1502 or AUTO1510.
(7 C: 2 lect/pres, 5 lab, 0 other)

AUTO 2511 - Automatic Transmission and Transaxle Overhaul

Advancements in the electronic control of automatic transmissions and transaxles require a good understanding of the hydraulic, mechanical, and electronic functions of these units in order to accurately diagnose problems. Students will study and apply the operation, repair, diagnosis and overhaul of automatic transmissions and transaxles. Students will learn automatic transmission internal mechanical and hydraulic components and overhaul procedures as well as the scan tools needed to diagnose them.

Student Learning Outcomes:

- * Implement safety procedures in accordance with automotive repair industry standards.
 - * Apply basic hydraulic and electric/electronic theory to the principles of torque multiplication and division using gear systems in automatic transmissions and transaxle operation.
 - * Service and adjust automatic transmissions/transaxles.
 - * Access and synthesize information using pressure gauges, Digital Vol-Ohm Meter (DVOM) and scan tools, air tests, road tests and reference material to accurately diagnose transmission/transaxle failures or problems.
 - * Remove, remanufacture and replace an automatic transmission and transaxle.
 - * Practice pollution prevention procedures involving storage, disposal or recycling of fluids and parts.
- Prerequisite(s): TRAN1502, TRAN1504, AUTO2506, AUTO1510.
(3 C: 1 lect/pres, 2 lab, 0 other)

AUTO 2512 - Driveline Repair

This lab course offers the opportunity for students to advance their abilities in the techniques and procedures of diagnosing and repairing driveline failures including automatic transmission and transaxle overhaul.

Student Learning Outcomes:

- * Identify and perform safety procedures relating to the automotive repair industry.
- * Service and adjust automatic transmissions/transaxles repairing leaks and minor malfunctions including related cooler and electrical circuits using processes, tools and equipment consistent with our industry standards.
- * Access and synthesize information in a timely manner, using pressure gauges, Digital Volt-Ohm Meter (DVOM) and scan tools, air tests, road tests and reference material to accurately diagnose transmission/transaxle failures or problems consistent with industry standards.
- * Remove, repair or rebuild and install an automatic transmission and transaxle consistent with industry standards.
- * Diagnose and repair driveline component failures in automotive and light truck applications, including locking hubs and AWD/4WD electronic control systems using processes, tools and equipment consistent with industry standards.
- * Remove, rebuild and replace a manual transmission/transaxle and transfer case consistent with industry standards.
- * Overhaul a differential consistent with industry standards.

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

* Practice pollution preventive procedures involving storage, disposal or recycling of fluids and parts.

Corequisite(s): AUTO2511

Prerequisite(s): TRAN1504, AUTO2506, AUTO1510, TRAN1502.

(3 C: 0 lect/pres, 3 lab, 0 other)

AUTO 2516 - Advanced Air Conditioning

This course covers the operation, testing, and repair of manual and automatic A/C systems.

Student Learning Outcomes:

- * Diagnose AC performance problems in manual or automatic systems
- * Recover, recharge and recycle R12 or R134 refrigerants within EPA regulations
- * Diagnose and repair vacuum control problems
- * Diagnose and repair electronic problems
- * Replace defective components

Corequisite(s): TRAN2514

(2 C: 0 lect/pres, 2 lab, 0 other)

AUTO 2520 - Engine Driveability

Students will learn advanced diagnostic procedures concerning engine performance problems. Lab work consists of using oscilloscopes, lab scopes, Digital Volt-Ohm Meter (DVOM) meters and scan tool usage when repairing engine performance problems on today's vehicles. Students will learn to perform engine performance service in accordance with manufacturer's procedures.

Student Learning Outcomes:

- * Demonstrate job entry skill development when performing basic vehicle diagnosis.
- * Assess driveability symptoms using a developed system approach.
- * Demonstrate ethical practices as it relates to engine performance service procedures.
- * Perform service module reflashing procedures in accordance with manufacturer's specifications.
- * Assess cam phasing and how it affects air flow through an internal combustion engine.
- * Demonstrate use of diagnostic procedures using a lab scope.
- * Demonstrate automotive technician professionalism.
- * Document vehicle data and work performed on repair orders.

Prerequisite(s): AUTO2502, AUTO2505.

(3 C: 1 lect/pres, 2 lab, 0 other)

AUTO 2523 - Advanced Electronic Systems

Students will learn automatic shift transmissions, automatic air conditioning, data lines and anti-theft systems. Lab work consists of using scan tools for diagnosis and repair on these electronic/mechanical systems on late model vehicles. Students will learn to describe system operation and perform service in accordance with manufacturer's procedures.

Student Learning Outcomes:

- * Perform inspection and repair procedures on automatic transmission and automatic A/C systems.
- * Perform inspection and repair procedures for data line communication systems.
- * Demonstrate use of generic and factory scanners.
- * Perform basic computer scan diagnosis.
- * Analyze transmission and body diagnostic trouble codes.
- * Demonstrate ethical practices as it relates to engine performance service procedures.
- * Perform vehicle anti-theft system diagnose and repair on late model vehicles.
- * Document vehicle data and work performed on repair orders.

Prerequisite(s): TRAN1504, TRAN1516.

(2 C: 1 lect/pres, 1 lab, 0 other)

AUTO 2538 - Supervised Internship

Students will work in a sponsoring automotive service facility. The work will be full time, approximately 40 hours per week. The tasks will be consistent with previous course work. This is a variable credit experience. Students may earn 1 to 4 credits. Course goals vary with the number of credits.

Student Learning Outcomes:

- * Identify maintenance requirements and various inspection procedures on late model vehicles.

* Demonstrate job entry skill development when performing basic service.

* Conform to federal OSHA and state MPCA rules as it relates to vehicle service procedures.

* Be aware of ethical practices as it relates to service procedures.

* Exhibit technician/mechanic professionalism.

(C: 0 lect/pres, 0 lab, 0 other)

AUTO 2540 - Light Duty Diesel

With the increased popularity and growing demand, light duty diesel engines have become a big influence in today's automotive and light duty truck market. This course is designed to give students the opportunity to identify and service components found on light duty diesel vehicles. This course will give students the opportunity to learn more of the basic operation's, controls, regulations and fuels that make today's diesel engine a large part of our transportation technology. Also to provide the opportunity to have some basic hands-on skills as an intern/apprentice technician in an auto/light duty repair facility, and to help prepare the student for taking the ASE (A-9) Light Duty Diesel certification test.

Student Learning Outcomes:

- * Locate appropriate service information related to diesel engine operation
- * Identify diesel fuel system components
- * Identify timing fired injection vs. common rail fuel injection
- * Locate and identify fuel system components
- * Service fuel filters and bleed air from the supply lines
- * Differentiate why supercharging and turbo charging produces more horsepower on a diesel engine.

* Identify and apply the differences between diesel fuels (#1, #2, and biodiesel)

Prerequisite(s): AUTO2502, AUTO1512 or AUTO1512, AUTO1522.

(2 C: 1 lect/pres, 1 lab, 0 other)

BLGY 1321 - Human Biology

Meets MN Transfer Curriculum Goal Area 3 - Natural Sciences. This course is intended to fill the course requirement for general sciences. Learners will find this course useful, as it provides a basic understanding of the structures and functions of the human body. Students will learn about all major human body systems, plus basic principles of life, body organization and homeostasis in lecture and laboratory experiments. Materials include, but not limited to textbooks, anatomical models, computer simulations and case studies.

Student Learning Outcomes:

- * Identify anatomical structures and function of human body including cells and its organelles.
- * Explain mechanisms of life sustaining processes.
- * Distinguish relationships between systems and organs for maintenance of homeostasis.
- * Relate changes in body structure and function to diseases.
- * Relate human anatomical systems to the physiology associated with each system.
- * Assess changes in the structure and function of organ systems as age-related v pathological.
- * Use scientific method in the formulation and conduction of laboratory experiment through actual or virtual dissections and simulations.
- * Create laboratory reports based on experimentation, dissection, and simulation.
- * Assess changes in structure and function of cells and organ systems in relation to cancer and cardiovascular diseases.
- * Form conclusions as to how diet and exercise affects the over-all function of human body.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.

(4 C: 2 lect/pres, 2 lab, 0 other)

BLGY 1325 - Nutrition

Meets MN Transfer Curriculum Goal Area 3 - Natural Sciences. Students should take this course to learn about nutritional requirements, how humans digest, absorb and metabolize nutrients and to improve their understanding of nutritional excess and malnutrition. Nutrition is a part of a holistic approach to health. A sound working knowledge of human nutrition is essential for any student wanting to lead a healthy life, parent healthy children and contribute in careers that focus on health. This course studies the chemistry and physiology involved in nutrition. Students will not only learn what and how much to eat, they will learn the science behind our nutritional needs; becoming informed consumers and valuable care givers for their families and for those with nutritional concerns. This class

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does not include a laboratory (lab) component.

Student Learning Outcomes:

- * Identify the composition and chemical nature of macro and micro nutrients utilized in the human body.
 - * Compare the digestion, absorption, transport and metabolism of the different macro nutrients in the body.
 - * Use diet recording and analysis tools to record and assess personal diet and the diets of others including those with specific nutritional needs.
 - * Identify deficiencies and excesses in a dietary analysis.
 - * Relate the results of the analysis to a patient's health.
 - * Prepare age-dependent sample diets.
 - * Evaluate nutrition sources for accuracy and bias.
 - * Plan the components of daily living including appropriate activity level, energy and nutrient intake related to holistic health.
 - * Relate the impact of nutrition and activity to the process of disease prevention.
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

BLGY 1351 - General Biology I

Meets MN Transfer Goal 3 - Natural Sciences. This course is an introductory biology course designed to provide students with an understanding of basic concepts in life sciences. There is an emphasis on the cell as the basic unit of life. This course serves as a foundation for more advanced courses required by students in biology or health related fields.

Student Learning Outcomes:

Lecture Outcomes:

- * Differentiate between science and other fields of knowledge and learning
- * Recognize the underlying unity to the diversity of life
- * Explain and identify the major biologically important elements and compounds to life
- * Display knowledge of the anatomy and physiology of cells
- * Demonstrate an understanding of the processes involved in cellular respiration and photosynthesis
- * Demonstrate an understanding of the mechanisms of inheritance
- * Recognize the role of genetic engineering and biotechnology in society

Lab Outcomes:

- * Demonstrate familiarity with the fundamentals of laboratory safety
 - * Display an understanding of problem solving in science
 - * Demonstrate correct use of laboratory equipment
 - * Relate biological concepts to laboratory activities
 - * Analyze laboratory results and prepare written lab reports
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score (4 C: 2 lect/pres, 2 lab, 0 other)

BLGY 1355 - General Biology II

Meets MN Transfer Curriculum Goal Area 3 Natural Sciences. This course covers biological processes, including a survey of life forms (viruses, bacteria, protists, fungi, plants, and animals), their evolution, and ecology. The laboratory focuses on organism taxonomy, classification, and mammalian systems including comparative anatomy, organism dissections, ecological interrelationships of organisms and their environment. This standard science course design is 2 hours face-to-face lecture and an accompanying 4 hours hands-on laboratory application of major scientific concepts which include some dissection of preserved animals and animal organs. This course meets the General Biology II requirement component of the MN State ASP, Biology.

Student Learning Outcomes:

- * Understand and apply knowledge of plant biology, animal biology, evolution and diversity, and ecology.
- * Recall, explain, and apply concepts, knowledge, and vocabulary of biology at the level necessary for success in subsequent biology courses for science majors.
- * Demonstrate understanding of the scientific theories in biology.
- * Demonstrate quantitative reasoning skills at a level appropriate for subsequent course in biology for science majors.
- * Distinguish between and demonstrate appropriate use of primary and secondary scientific literature.
- * Formulate and test hypotheses by performing laboratory experiments in biology that include the collection of data, statistical analysis, graphical presentation of results and interpretation of sources of error and uncertainty.
- * Communicate experimental findings both orally and in writing.

* Understand and apply knowledge of use of the microscope and other biological laboratory equipment, and apply that knowledge in the proper conduct and interpretation of laboratory investigations.

* Interpret how the history of life over the geologic time scale explains patterns and interrelationships of bio-physical and socio-cultural system.

* Diagram major taxa of organisms by morphology.

* Examine the effect of humans on the environment.

* Evaluate the major threats to biodiversity.

* Summarize how organisms interact with each other and their environment.

Prerequisite(s): MATH1300, OR MATH1350, AND BLGY1351.

(4 C: 2 lect/pres, 2 lab, 0 other)

BLGY 2310 - Human Anatomy/Physiology I

Meets MN Transfer Curriculum Goal Area 3 - Natural Sciences. Human anatomy and physiology is the study of the structure and function of the human body in health and disease. Beginning from a solid base of general biological knowledge students will study the integumentary, skeletal, muscular, and nervous systems. In addition to these basic areas of study, histology is covered in general and in detail as it relates to each of the above organ systems. This class includes a laboratory (lab) component.

Student Learning Outcomes:

- * Explain the function of each organ system.
- * Name the relevant structures of each organ system covered in the class.
- * Relate physiological significance to anatomical structures.
- * Classify tissue types by function and location.
- * Deconstruct blood calcium regulation and muscular excitation/contraction.
- * Explain the function of each type of neuron and glial cell.
- * Compare the neural pathways of each sense.
- * Compare the receptors of each of the senses.
- * Classify as excitatory or inhibitory the innervation of the autonomic nervous system to each organ/tissue.
- * Relate clinical findings (signs and symptoms) to anatomical and physiological concepts covered in class.
- * Recognize the effect of aging on the systems covered in class.

Prerequisite(s): BLGY 1351.

(4 C: 2 lect/pres, 2 lab, 0 other)

BLGY 2320 - Human Anatomy/Physiology II

Meets MN Transfer Curriculum Goal Area 3 - Natural Sciences. Human anatomy and physiology is the study of the structure and function of the human body in health and disease. It is a continuation of Human Anatomy and Physiology I, BLGY 2310. In this class students will study the endocrine, cardiovascular, lymphatic, immune, urinary, respiratory, digestive, and reproductive systems. In addition to these organ systems students will study fluids and electrolytes, nutrition and metabolism, development, pregnancy and heredity. This class includes a laboratory (lab) component.

Student Learning Outcomes:

- * Name the relevant structures of each organ system covered in the class.
- * Relate physiological significance to anatomical structures.
- * Classify tissue types by function and location.
- * Deconstruct the hypothalamic pituitary axis of the endocrine system.
- * Deconstruct blood pressure, fluid, electrolyte and gas regulation, the immune response, juxtaglomerular and nephron function.
- * Compare and contrast the components of the digestive system.
- * Compare and contrast the male and female reproductive systems including homologous structures.
- * Classify the stages of pregnancy along with the fetal and maternal changes related to each stage.
- * Recognize the effects of aging on the systems covered.
- * Construct relationships between organ systems required of an organism "holistic theme".

Prerequisite(s): BLGY2310.

(4 C: 2 lect/pres, 2 lab, 0 other)

BLGY 2330 - Microbiology

Meets MN Transfer Goal Area 3 - Natural Sciences. This course will cover the foundation and fundamentals of microbiology including classification and identification of microorganisms. A survey of microbes will focus on those involved in human pathogenesis. Laboratory exercises will emphasize basic microbiologi-

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cal techniques and principles of diagnostic microbiology. Major consideration is given to the development and mastery of technical and critical thinking skills necessary to perform well in a clinical setting. Microbiology is a very rigorous course requiring a great deal of study for student success. Students are highly encouraged to study 10-12 hours per week outside of class to be minimally successful.

Student Learning Outcomes:

- * Appreciate the historical foundations of microbiology and understand the key features that form the framework of microbiologic study today
 - * Understand the scope of microbiology with respect to the impact of microbes in the world
 - * Integrate the roles of cellular biology and chemistry in the processes of microbial metabolism, infectious disease and the immune response
 - * Understand the biodiversity and complexity of microorganisms
 - * Describe the major groups of microorganisms and their taxonomies
 - * Know the medical terminology that applies to the study of Microbiology
 - * Demonstrate proficiency in and understanding of common microbiologic laboratory techniques, procedures, and evaluative methods related to the safe handling, proper cultivation and identification of microbes
 - * Understand the complex interactions that occur between host organisms and microbes
 - * Demonstrate knowledge of the processes of the immune system
 - * Analyze the effectiveness of methods of microbial control
 - * Describe the structure and function of the major organ systems of the human body
 - * Understand the pathogenesis of the infectious diseases of humans including etiologies, methods of transmission, diagnoses and appropriate treatments
 - * Analyze case studies based on patient history, clinical signs and symptoms to determine differential diagnoses, diagnostic tests, effective treatments and client education, if appropriate
 - * Integrate information and become a problem-solver for disease identification
 - * Be aware of the procedures necessary to maintain a safe environment for themselves, their families, at work, for their patients etc. with respect to microbes
 - * Effectively utilize appropriate resources to investigate infectious disease processes
- Prerequisite(s): BLGY1351.
(4 C: 2 lect/pres, 2 lab, 0 other)

BLGY 2340 - Genetics

Meets MN Transfer Curriculum Goal Area 3 Natural Sciences. This course studies the basis of heredity, combining classical Mendelian genetics with the contributions of molecular biology. Students will explore genetic principles as they apply to biology from the molecular level thru the population level. This course is appropriate for all students interested in the study of heredity and genetics. It meets the genetics requirement component of the MN State Associate of Science Pathway, biology.

Student Learning Outcomes:

- * Summarize how eukaryotic and prokaryotic DNA, RNA, genes, chromosomes and proteins produce traits in organisms.
 - * Apply known heredity patterns to predict offspring genotype and phenotype ratios and vice versa.
 - * Predict the possible effects of a specific chromosomal change on an organism.
 - * Apply basic statistical principles, such as chi square, to genetic data.
 - * Use the scientific method in the formulation and conduction of genetic experimentation.
 - * Apply known heredity patterns to predict offspring genotype and phenotype ratios and vice versa.
 - * Use the scientific method in the formulation and conduction of genetic experimentation.
 - * Create (including organization, drafting and editing) formal scientific writing using current standards of writing and citation.
 - * Relate the principles of genetics to risk and development of human cancer.
 - * Identify the risks and rewards offered by genetic engineering/biotechnology to humans and the world.
- Prerequisite(s): BLGY1351, CHEM1350.
(4 C: 3 lect/pres, 1 lab, 0 other)

BMET 2405 - Administrative Functions

This course fulfils course requirements for the Biomedical Equipment Technol-

ogy program. This is an introductory course to the biomedical field as it relates to healthcare technology management (HTM). This course prepares students for the requirements of regulatory agencies, introduces them to computerized maintenance management systems (CMMS), and explains the role of biomedical professionals in the management of information including work orders. This course includes a lab component that emphasizes accurate data collection and analysis. This course will also expose individuals to the many opportunities within the HTM realm post-graduation. This course offers site tours, frontline BMET staff interviews and job shadowing.

Student Learning Outcomes:

- * Distinguish between various regulatory agencies responsible for oversight of healthcare operations.
 - * Prepare appropriate work order documentation using a computerized maintenance management system.
 - * Differentiate between subjective and objective data that is to be documented within the CMMS system.
 - * Describe and elaborate upon medical gas safety systems.
 - * Identify National Fire Protection Agency (NFPA) 99 codes and explain how they are used in healthcare environment.
 - * Demonstrate the ability to test the electrical safety of medical equipment and identify if unit passes the NFPA requirements.
 - * Define and explain patient privacy and confidentiality policies.
 - * Identify and apply appropriate safety procedures when working in the biomedical lab.
 - * Understand the biomedical professions.
 - * Give examples of various employment and regulatory requirements.
 - * Identify proper personal protection equipment (PPE) for various infectious disease scenarios and isolation precautions.
 - * Follow policies and procedures outlined in a Medical Equipment Management Plan (MEMP).
- Prerequisite(s): ENGL1302, or ENGL1303, or ENGL1308.
(4 C: 2 lect/pres, 2 lab, 0 other)

BMET 2425 - Biomedical Technology

This course fulfils course requirements for the Biomedical Equipment Technology program. This course provides students with an overview of the biomedical technology field. This course will provide a general overview of the daily operations of biomedical technicians. Coursework covers biomedical asset control, equipment tracking and control, and planned maintenance on all equipment. Students will also learn the relationships between equipment and patient care. Students will work with a diversity of equipment, and clinical staff to ensure equipment is available, calibrated and ready to help save lives.

Student Learning Outcomes:

- * Create from scratch proper maintenance procedures on equipment.
 - * Track and record all biomedical assets and maintain asset tags on equipment.
 - * Document predictive/preventive maintenance and other repairs in a work order system.
 - * Perform maintenance on a variety of medical equipment such as pumps and vitals machines.
 - * Add new equipment to the Computerized Maintenance Management System (CMMS) system and complete an incoming inspection on the unit.
 - * Complete an inventory verification of an assigned department.
 - * Document all equipment maintenance and productive time in a work order system.
 - * Test electrical safety of medical equipment and identify if unit passes the National Fire Protection Agency (NFPA) requirements.
 - * Work side-by-side with a diverse staff in the healthcare environment.
 - * Follow patient privacy and confidentiality policies.
 - * Follow NFPA 99 codes and explain how they are used in healthcare environments.
 - * Distinguish between clean and sterile instruments.
 - * Identify surgical areas and proper attire to enter surgical areas.
 - * Locate user and service manuals for various medical equipment.
 - * Identify various video sources, connectors and video integration systems.
- Prerequisite(s): ETEC1507.
(5 C: 2 lect/pres, 3 lab, 0 other)

BMET 2430 - Medical Equipment Networking

This course fulfils course requirements for the Biomedical Equipment Technology program. This course covers the operation and maintenance of medical

equipment network systems within the HTM realm. The major topics covered are medical networking applications, HL7, EMR, telemetry, security topics, and medical network troubleshooting. This course includes a lab component where students install, test and inspect a patient monitoring network.

Student Learning Outcomes:

- * Summarize common medical networking applications.
- * Explain the difference between hard wired and wireless monitoring network.
- * Install test and inspect a patient monitoring network.
- * Illustrate network infrastructure components.
- * Summarize how interoperability impacts medical equipment.

Prerequisite(s): ETEC1535. (2 C: 1 lect/pres, 1 lab, 0 other)

BMET 2435 - Biomedical Instrumentation

This course fulfills course requirements for the Biomedical Equipment Technology program. This course provides continued study in the theory of operation of medical and test equipment. In addition, the theory of circuit analysis, calibration procedures, troubleshooting techniques, and safety precautions are covered. The student will become familiar with various types of test equipment associated with clinical instrumentation. Upon completion, students will be able to repair, calibrate and certify that medical equipment meets manufacture specifications.

Student Learning Outcomes:

- * Discuss blood flow in the human body and its relationship to various pump and pressure meters.
- * Discuss equipment maintenance and considerations.
- * Analyze how biomedical transducers convert measured quantities into electrical signals.
- * Draw a block diagram of a piece of medical equipment.
- * Discuss DICOM, basic radiology and x-ray system.
- * Perform functional checks on various types of medical equipment including EKG's, ESU's, etc.
- * Perform equipment inspections and necessary maintenance on lab equipment including centrifuges and microscopes.
- * Summarize an industry hot topic or in an industry journal.
- * Compose, develop and execute a capstone project relevant to the HTM industry.
- * Discuss the importance of equipment uptime.
- * Present various medical equipment information to a clinical audience.
- * Inspect, troubleshoot and repair various equipment including dental and general nursing items.
- * Create, write and close work orders utilizing appropriate documentation standards.
- * Document a minimum of 85% of lab time.
- * Analyze work order documentation.

Prerequisite(s): BMET2420, BMET2425. (5 C: 2 lect/pres, 3 lab, 0 other)

BMET 2440 - Biomedical Equipment Technician Internship

Introduces the student to an on-site learning experience at an operating biomedical equipment section of a health care facility. The student will be assigned to a regional health care facility to complete the requirements of this course. Supervision of the intern is shared by a health care facility supervisor and a SCTCC faculty member. Placement will be approximately 4-8 hours per week off campus in a technical capacity with a hospital or an employer in the biomedical field. The college and the employer will jointly evaluate the student, which will then serve as a basis for a final grade.

Student Learning Outcomes:

- * Identify the basic operations of each department of the hospital.
- * Identify equipment operations for each department of the hospital.
- * Summarize the organization, policies and procedures of a Biomedical Equipment Technology Department.
- * Calibrate medical equipment accurately.
- * Work with hospital staff in a respectful and collaborative manner.
- * Troubleshoot equipment problems effectively.
- * Respond accordingly to instructions and concerns of superiors, co-workers and other hospital staff.
- * Adhere to applicable safety procedures.
- * Repair medical equipment properly.
- * Record and report experience working as a BMET at internship site.
- * Create a portfolio (including resume) of educational highlights to share with instructor and internship site.
- * Participate in at least 2 mock interviews with industry professionals.

(3 C: 0 lect/pres, 0 lab, 3 other)

BUSM 1207 - Basic Keyboarding

Students will build accuracy and speed using the alpha, numeric, symbol, and service keys on the keyboard. Emphasis will be placed on the development of basic keyboarding techniques.

Student Learning Outcomes:

- * Operate by touch the letter, number and symbol keys
- * Demonstrate proper typing technique
- * Type 35 words a minute on a 2-minute timing with no more than 5 errors
- * Use the correct spacing with punctuation

(1 C: 0 lect/pres, 1 lab, 0 other)

BUSM 1212 - Customer Relationship Management

The course presents a practical approach to understanding, implementing and practicing the principles of customer service within different types of organizations. Students will examine service strategies in different organizations and businesses; learn about different supporting tools and techniques to provide quality service; and analyze customer information to identify opportunities for service improvement.

Student Learning Outcomes:

- * Learn customer service terminology and processes
- * Identify the roles and relationships within different customer service environments
- * Examine the principles and practices of internal and external service
- * Examine the stages of customer service development during the service process and the communication opportunities available
- * Discuss the need and strategies for continuous improvement in services and its benefit to an organization
- * Learn processes and techniques for communicating with a variety of customers, situations and circumstances, and practice appropriate responses
- * Gain an understanding of how and when to use different communication technologies when working with internal and external customers
- * Examine and utilize tools and technologies used for customer service improvement
- * Analyze customer data to identify service gaps and present possible solutions
- * Demonstrate customer services in a variety of environments including e-mail, telephone, live chat, face-to-face, Internet, etc.

(3 C: 3 lect/pres, 0 lab, 0 other)

BUSM 1217 - Business Communications

This course focuses on giving students the ability to communicate effectively through written, oral and interpersonal channels. It allows students to practice using appropriate channels of workplace communication. This course covers creating, writing, presenting, and editing a variety of business communications. Students will continue to develop grammar, punctuation, spelling, vocabulary, and speaking skills.

Student Learning Outcomes:

- * Apply correct punctuation, grammar, sentence structure, and business vocabulary to all forms of communication
- * Apply a receiver focus to business writing and speaking
- * Apply the "communication by objective approach" to communications
- * Write good news and bad news letters
- * Understand and utilize appropriate communication channels
- * Communicate person-to-person, in groups, and with an audience, using tools and strategies to meet desired outcomes
- * Study interpersonal communication skills and strategies
- * Apply communication strategies to meet the needs of diverse audiences
- * Utilize appropriate technologies to enhance communications
- * Solve communication barriers using tools and methodologies that support understanding
- * Apply electronic etiquette
- * Develop communication skills that reflect high ethical standards
- * Utilize distance and collaborative technologies

(3 C: 3 lect/pres, 0 lab, 0 other)

BUSM 1260 - Applied Business Mathematics/Calculators

This course covers application of mathematic functions to the solution of business problems. This course emphasizes practical hands on approaches to prepare students for careers in business with a focus on real-world application. Develop-

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ing math competency in business applications of interest, financial statement analysis, discounts, merchandise inventory, inventory pricing, credit financing, fixed asset costs, future and present value, operation ratios, corporate stocks, government and corporate bonds. Applied Business Mathematics prepares students for the math requirement of future business courses and business careers.

Student Learning Outcomes:

- * Solve business mathematical functions using a 10-key calculator.
 - * Identify and calculate the base, rate and percentage of business transactions.
 - * Use percents to measure increase and decrease in financial data and to allocate overhead expenses.
 - * Determine the proper amount to pay on invoices utilizing cash, series and trade discounts.
 - * Demonstrate pricing procedures related to markup based on cost or selling price.
 - * Calculate the correct value of ending inventory and cost of goods sold based on FIFO, LIFO and Average costing methods.
 - * Estimate ending inventory using the cost of goods sold.
 - * Analyze the effect of Fixed Assets on the financial statements using various depreciation methods.
 - * Calculate and understand the impact of simple and compound interest on business transactions.
 - * Determine interest earned and deposits required for business investments using future and present value concepts.
 - * Understand the financial impact of various installment purchase decisions.
 - * Analyze balance sheets and income statements, comparing items and periods and operating ratios.
 - * Compute the costs and proceeds of stock transactions along with comparative earning potential.
- (3 C: 2 lect/pres, 1 lab, 0 other)

BUSM 1267 - Introduction to Business

This course provides fundamental knowledge of the characteristics and functions of business in our economic environment as well as how business impacts our society. Areas of study include ownership, economics, business ethics, international business, management, motivation, leadership, marketing, finance, and components of a business plan. Through this course students gain an understanding of business operation so that employees in various positions can play an integral part of the overall success of any organization.

Student Learning Outcomes:

- * Explain the contemporary business environment.
 - * Show the difference between the various forms of business ownership.
 - * Apply basic economic concepts to the business environment.
 - * Identify the ethical effects and consequences of business applications in our society.
 - * Compare and contrast the organizational structures used within organizations.
 - * Demonstrate various motivational theories as they apply to the workplace.
 - * Identify marketing principles within business operations.
 - * Explain how the global economy affects the local business environment.
 - * Recognize various leadership styles and how they affect business performance.
 - * Identify investment fundamentals.
 - * Identify business plan components through analyzing existing business plans.
- (2 C: 2 lect/pres, 0 lab, 0 other)

BUSM 1290 - Job Seeking/Keeping Skills

In this course, students will take a comprehensive approach to career decisions and planning. Students will develop job-search strategies as well as the crucial attitudes and skills needed for keeping jobs and growing in their chosen career.

Student Learning Outcomes:

- * Demonstrate effective and efficient ways to search for jobs in online and print databases and publications.
 - * Develop appropriate and personalized communications used during job search and interview processes.
 - * Review acceptable interview skills, dress, and behaviors.
 - * Define critical practices and persona necessary for job keeping and career growth.
- (1 C: 1 lect/pres, 0 lab, 0 other)

BUSM 2210 - Project Management

The course presents a practical approach to understanding, implementing, and

practicing the principles of project management within different types of organizations. Students gain a basic understanding of project management and how to organize tasks using Microsoft Project and other technologies. Students will learn to communicate and work within different types of project teams using a variety of communication methods and develop skills in planning, managing, and implementing a project.

Student Learning Outcomes:

- * Introduce students to the roles and functions of project management in an organization
 - * Examine the principles and practices of project management utilizing different tools and methodologies
 - * Apply tools and techniques used in planning, managing, and implementing a project
 - * Acquire and fine-tune the skills necessary to define, plan, initiate and monitor projects using proven techniques and commonly available computer software tools
 - * Understand and apply methods for solving and avoiding common difficulties associated with project management
 - * Develop cost estimates, forecasts, and budgets to proactively track project expenditures
 - * Apply continuous quality improvement and learn techniques to project initiatives
 - * Develop the communication, organization, prioritization, problem solving, decision making, teamwork, and analytical skills necessary to manage a project and work with a diverse project team
- Prerequisite(s): ADMS2240. (3 C: 3 lect/pres, 0 lab, 0 other)

BUSM 2275 - Legal Environment of Business

This course covers key areas of law that impact both domestic and international businesses. A wide range of topics will be covered, including the ethics and social responsibility the law imparts on a business. The course will focus on constitutional, statutory, and regulatory law as it pertains to business. Key topics covered will be the court system, contracts, employment law issues, torts, product liability, business entities, environmental law, and discrimination. Research and case law will be an integral part of the course as students learn to apply knowledge to business situations.

Student Learning Outcomes:

- * Demonstrate knowledge and application of business law concepts and terms, and apply these concepts and terms to both domestic and international business issues.
 - * Compare and distinguish sources of law including constitutional law, statutory law and case law
 - * Understand the court system and Alternative Dispute Resolution, and how each applies to civil and criminal business issues
 - * Evaluate the consequences of business decisions and identify and analyze any ethical issues in a professional context
 - * Communicate legal and ethical principles in a professional manner both orally and in writing
 - * Apply legal principles to contracts, product liability and warranties, real property law, landlord/tenant law, agency law, and employment law
 - * Identify and contrast major components of estate planning including health care directives, wills, trusts and estates
 - * Evaluate and defend alternative outcomes in legal case scenarios
- (3 C: 3 lect/pres, 0 lab, 0 other)

CACE 1400 - Professional Relations in CACE Careers

This course explores career opportunities for working with people in CACE professions. Students will examine job requirements, duties, regulations, and issues, skills, and personal characteristics for becoming successful professionals in child and adult care and education and paraprofessional careers.

Student Learning Outcomes:

- * Apply relevant knowledge and proper use of technology in the context of personal, professional and civic interactions within the profession.
- * Research licensing requirements for Rule 2, Rule 3, Rule 8, and School-age Child Care Guidelines for application in job settings.
- * Compare and contrast: wages, benefits, and pay structures; working conditions; and professional philosophies, missions, and goals in a variety of job settings to determine career opportunities.
- * Demonstrate team roles and positive collaborative relationships with col-

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leagues, professionals, and families with sensitivity to diverse peoples and cultures to perform effectively as a team member.

- * Exercise individual and social responsibilities through personal development and self-advocacy, healthy life-style choices, ethical behavior, civic involvement and interaction with diverse cultures.

- * Identify and demonstrate professional behaviors such as positive attitude, problem-solving skills, confidentiality, and communication to perform effectively in the workforce.

- * Identify and utilize professional literature, organizations, and resources to promote a commitment to life-long learning and engagement with advocacy and global issues.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

CACE 1404 - Safety, Health and Nutrition

This course will guide the student in obtaining skills needed to establish and maintain a physically and psychologically safe and healthy environment for young children. Topics include preventing illness and accidents, handling emergencies, providing health, safety, and nutrition educational experiences, meeting children's basic nutritional needs, child abuse, and current health related issues. THIS COURSE DOES NOT INCLUDE CPR OR FIRST AID CERTIFICATION.

Student Learning Outcomes:

- * Demonstrate universal health and hygiene procedures including handwashing, sanitation and diapering

- * Describe childhood illnesses and communicable diseases and the policies and procedures related to those illnesses, including immunizations and exclusion policies

- * Describe safety practices such as fire, traffic, poison and injury

- * Become aware of the indicators and responsibilities of protecting children from physical, emotional, and sexual abuse and neglect

- * Identify personal, professional, and program risks and risk reduction strategies

- * Describe basic nutrition guidelines and meal planning for the various stages of growth and development

- * Promote healthy lifestyles for children by planning such things as nutritious snacks, exercise routines and dental health activities

- * Examine health, safety and nutrition licensing requirements

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score .
(3 C: 3 lect/pres, 0 lab, 0 other)

CACE 1420 - Foundations of Development

This course is designed to provide an overview of typical and atypical development across the lifespan, from prenatal through late adult, including physical, social/emotional, and cognitive development. It integrates developmental theory with appropriate practices in a variety of care giving, community and educational settings. An understanding of lifespan development is essential to meeting workforce needs for clients in multiple settings.

Student Learning Outcomes:

- * Identify physical, cognitive, and social-emotional human growth and development in each of the life-span stages.

- * Evaluate current research on issues pertaining to life-span development.

- * Examine the stages of moral development for human growth and development.

- * Examine the stages of language development for human growth and development.

- * Describe methods to support cultural diversity as it applies to human development.

- * Analyze the dynamics of family relationships on individuals from birth to late adulthood.

- * Study the process of death and dying to gain understanding of cultural variations in attitudes towards death.

- * Research current topics related to the life-span development stages.

- * Evaluate community resources that support individuals throughout the life span.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.

(3 C: 3 lect/pres, 0 lab, 0 other)

CACE 1422 - Profiles of the Exceptional Child

This course provides an overview of individuals with disabilities. The student will learn the importance of inclusion and the impact it has on children/adults with disabilities by examining legal and social environments. The student will also learn about modification of learning materials, observation techniques and

personal philosophy in a variety of learning environments.

Student Learning Outcomes:

- * Examine current and past legislation (PL94-142, IDEA) and integrate into present educational systems.

- * Examine the characteristics of intellectual and physical disabilities.

- * Discuss positive inclusive strategies for a person with disabilities.

- * Create a personal philosophy of inclusion that applies the principles of least restrictive environment (LRE) and universal design.

- * Analyze and implement techniques for observing, recording, and assessing a child/adults behavior.

- * Create and modify activities to meet the unique needs of a child/adult in the least restrictive environment (LRE).

- * Examine the Individual Family Service Plan (IFSP), Individual Education Plan (IEP), Individual Service Plan (ISP) and Individual Health Plan (IHP) processes for providing services to children/adult with disabilities.

- * Identify community agencies and other resources to meet the individual needs of children and families with disabilities.

- * Examine the importance of technology and its impact on learning strategies with children/adults with disabilities.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

CACE 1424 - School-Age Strategies for Learning

This course is designed to introduce and provide an overview of educational strategies with emphasis on school-age theory and development in home, school and/or center-based settings. Students will integrate knowledge of developmental needs, developmentally appropriate environments, effective care-giving, teaching strategies/methods and observation methods for the school-age child (5-12 years old). The course is designed to support the child care component of the CACE/PARA Program and for those preparing for a career in school-age child care.

Student Learning Outcomes:

- * Integrate knowledge of the developmental stages and characteristics of school-age children in lesson and program planning.

- * Broaden perspective of the historical and philosophical middle childhood theories.

- * Compare the relationship and role of families and schools to learning and educational programs.

- * Identify strategies to help children make and keep friends, resolve conflicts and develop self-image.

- * Implement methods, strategies, and materials to develop the cognitive, social, moral, and physical needs of school age children.

- * Implement methods, strategies, and materials to develop content areas of language, arts, math, science and technology for school age children.

- * Identify the effects of the home, school and community environment on school-age children.

- * Identify diverse cultural needs of the school-age child and environments.

- * Develop technology skills related to school-age appropriate tools.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score and CACE1444.

(3 C: 3 lect/pres, 0 lab, 0 other)

CACE 1426 - Children with Difficult Behaviors

This course helps students understand children with behavior problems. Students will identify intervention strategies to prevent and resolve problem behavior, design behavior plans, and use behavior modification techniques.

Student Learning Outcomes:

- * Identify difficult behavior factors and causes

- * Evaluate classroom, guidance, and family strategies to support children exhibiting a variety of difficult behaviors, including post traumatic stress syndrome, immaturity, insecurity, nervousness, peer problems, family chemical dependency

- * Evaluate classroom, guidance, and family strategies to support children exhibiting anti-social and/or aggressive behaviors

- * Explain impact on family structure, stress, and changes on behavior

- * Write individual guidance plans and/or behavior modification plans

- * Define therapy methods including play therapy and bibliotherapy

- * Plan a parent conference addressing the needs of a child with difficult behavior

- * Utilize community agencies and other resources

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.

(3 C: 3 lect/pres, 0 lab, 0 other)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

CACE 1428 - Family and Community Relations

This course is designed to increase a student's knowledge of diverse families and provides an opportunity to examine how current societal and community relationships impact the development of children and the well-being of families. In addition the student will explore the changing role and structure of families and look at the social service systems, legal systems, and family support systems in their community.

Student Learning Outcomes:

- * Examine families and communities as dynamic, complex social systems across the lifespan.
 - * Research, practice, and implement positive community strategies that support/enhance and empower families to thrive.
 - * Examine family diversity and the issues related to attitudes, prejudice and bias related to race, culture, age, sex, and socio-economic class.
 - * Develop communication skills to build positive partnerships with parents, families and community members.
 - * Identify and implement community involvement, advocacy roles and responsibilities.
 - * Examine benefits of and barriers to teacher-parent, family and community partnerships.
 - * Understand the impact of social and historical context upon family life and dynamics.
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

CACE 1440 - Guidance: Managing the Physical and Social Environment

This course provides an exploration of the physical and social environments that promote learning and development. It includes an introduction to basic guidance techniques for individual and group situations in the child and adult care field. The student will also learn about the impact that the social and physical environment plays on behavior management.

Student Learning Outcomes:

- * Identify and evaluate environmental influences that impact learning and behavior for children and adults.
 - * Define and observe interest areas for learning and positive behavior management.
 - * Explain problem prevention strategies for managing the physical classroom environment.
 - * Define behavior modification, positive reinforcement and positive behavior management.
 - * Assess the impact of personal guidance beliefs and assumptions on behavior management.
 - * Demonstrate the following guidance strategies: recognition, positive communication, limit setting, problem-solving, and behavior modification.
 - * Describe problem-solving techniques for utilization in managing behaviors.
 - * Develop rules and expectations for positive guidance strategies.
 - * Evaluate developmentally appropriate learning environments in the sensory-motor, cognitive, social-emotional, language, and creative arts areas.
 - * Develop a positive behavior plan for a child and/or an adult.
 - * Demonstrate validation therapy for adults with dementia.
 - * Apply and assess technology in managing behavior for children and adults.
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

CACE 1444 - Planning and Implementing Curriculum

This course is designed to examine the role of the teacher and teaching strategies in early childhood settings. These strategies apply knowledge of child development, program development, intervention and assessment. This course provides early childhood best practices to support successful instruction and program development with preschool children in childcare and school environments.

Student Learning Outcomes:

- * Describe development in the following areas: sensory-motor, cognitive, language, physical and social-emotional.
- * Examine developmentally appropriate practices as it relates to individual children, communities, and curriculum.
- * Examine the role of parent and family to support childcare and children's services.
- * Examine learning through play.

- * Demonstrate experimental learning through small and large group play activities.
 - * Demonstrate motivation strategies to enhance learning and participation.
 - * Implement teaching strategies and learning experiences in early childhood development areas.
 - * Demonstrate positive communication and problem-solving techniques.
 - * Implement activities utilizing age appropriate technology.
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

CACE 1448 - Literature and Language Development Experiences

Children's Literature is a powerful and fun component in language development. Students will have the opportunity to work with a variety of wonderful books!

This course provides an overview of language and literacy learning experiences in school, home, or center-based settings. Students will integrate knowledge of children's language development, learning environments, and teaching methods to select, present, and evaluate literature experiences, and to promote literacy and conversation.

Student Learning Outcomes:

- * Review, identify, describe, analyze, examine, collect, prepare, implement and evaluate whole language learning experiences
 - * Review, identify, describe, analyze, examine, collect, prepare, implement and evaluate conversation learning experiences
 - * Review, identify, describe, analyze, examine, collect, prepare, implement and evaluate rhyme learning experiences
 - * Review, identify, describe, analyze, examine, collect, prepare, implement and evaluate children's literature learning experiences
 - * Review, identify, describe, analyze, examine, collect, prepare, implement and evaluate home language/bi-lingual learning experiences
 - * Describe children's literature and literacy
 - * Examine picture books, non-fiction, fiction, fairy tales/folk tales, and poetry
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

CACE 1455 - Aging: Activities and Adaptations

This course explores the importance of cognitive and social activities for the aging population in order to enhance the quality of care for these individuals. It is designed for individuals who would be responsible for coordinating and delivering activities in a variety of settings including residential care, adult day care and short term care facilities. Students will gain the knowledge needed to plan, implement and evaluate activities for the elderly.

Student Learning Outcomes:

- * Examine the changes of the aging brain.
 - * Develop an understanding of the benefits of mental and physical activities for older adults based on current and relevant research.
 - * Design meaningful activities that meet the cognitive and social needs of the aging individual.
 - * Integrate teaching strategies when implementing meaningful activities for the elderly.
 - * Design a form that reflects the importance of communicating relevant information regarding the implementation of activities to the families of those involved and the wider community.
 - * Examine the principles of working with people with dementia.
 - * Develop culturally appropriate strategies as part of the activity planning process.
 - * Record and give feedback as part of the planning process and use this evaluative process to assess future resource needs.
 - * Analyze the social, interpersonal and cultural stereotypes/biases about aging and develop a positive, sensitive attitude that values the elderly.
 - * Discuss the importance of confidentiality and vulnerable adults.
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

CACE 1460 - Internship I

This course gives the students the opportunity to observe, practice, and apply skills and techniques at an introductory level. These opportunities will take place in a variety of supervised placements. Faculty will work with students to choose internship placement at sites set up with contracts through the college. This

internship experience is a crucial part of the CACE/PARA program as it gives the students the opportunity to practice and implement skills learned throughout the program.

Student Learning Outcomes:

- * Observe, perform, and evaluate child guidance skills.
- * Observe and evaluate learning experiences for the following developmental areas: language, cognition, social-emotional, sensory-motor, creativity, math and science.
- * Observe and evaluate parent communication skills.
- * Observe and evaluate growth and development in the areas of sensory-motor, cognitive, social-emotional, language, and creativity.
- * Observe and implement teaching strategies addressing growth and development in the areas of sensory-motor, cognitive, social-emotional, language, and creativity.
- * Demonstrate team building and professional relations skills and behaviors.
- * Apply site policies and procedures.
- * Prepare a resume.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score or MATH0400.

(3 C: 1 lect/pres, 0 lab, 2 other)

CACE 1464 - Internship II

This course provides an opportunity to apply knowledge and skill in care giving and/or education settings. Students will observe and assess behavior, facilitate free choice activities and plan and implement child/adult learning experiences, as well as maintain professional relationships. This course is a vital component of the CACE/PARA program as it gives students the opportunity to implement skills learned in other program courses.

Student Learning Outcomes:

- * Observe children/adults in the following developmental areas: language, cognition, social-emotional, sensory-motor, creativity, math and science.
- * Practice and evaluate one-on-one, small and large group teaching strategies.
- * Analyze experiences for cultural sensitivity and diversity in the following developmental areas: language, cognition, social-emotional, sensory-motor, creativity, math and science.
- * Integrate learning experiences into the daily or weekly schedule from the following developmental areas: language, cognitive, social-emotional, sensory-motor, creativity, math and science.
- * Arrange learning environments for the following developmental areas: language, cognition, social-emotional, sensory-motor, creativity, math and science.
- * Implement learning experiences in the following developmental areas: language, cognition, social-emotional, sensory-motor, creativity, math and science.
- * Demonstrate communication skills with supervisors, teachers, professional staff and the children/adults.
- * Plan and implement daily routines and transitions in a supervised environment.
- * Prepare a cover letter and revise a resume.
- * Apply site policies and procedures.

Prerequisite(s): CACE1460. (3 C: 1 lect/pres, 0 lab, 2 other)

CACE 1470 - Professional and Leadership Development

This course focuses on the importance of professional organizations and community service. The course allows a student to develop self-confidence, practice leadership and management skills while involved in professional organizations.

Student Learning Outcomes:

- * Develop social skills and workplace ethics
- * Demonstrate civic responsibility
- * Create a portfolio/e-portfolio that will provide an effective transition from college to work
- * Demonstrate leadership skills
- * Prepare, revise, and rewrite a resume and cover letter

Prerequisite(s): CACE1400.

(1 C: 1 lect/pres, 0 lab, 0 other)

CACE 1473 - Strategies in Reading for the Paraprofessional

This course is designed to provide students with the skills necessary to support and reinforce the instruction of K-6 students in the area of reading. This course combines an understanding of how children learn to read with the instructional strategies necessary to promote students as they learn to read. In addition, students will examine the reading skills and knowledge of reading required of

prospective and practicing paraprofessionals, and their ability to apply those skills and knowledge when assisting in classroom instruction.

Student Learning Outcomes:

- * Develop the ability to access and effectively use available resources for supporting teacher instruction in the subject of reading.
- * Identify effective developmental, age-appropriate, and culturally sensitive instructional strategies in reading that support the instruction of licensed teachers.
- * Develop and implement the recording of data regarding student performance in the area of reading using tools such as rubrics, curriculum-based measurement, and informal assessments.
- * Define the terminology related to the instruction of reading.
- * Assess how the Minnesota Standards and Testing (including state and local testing) direct the teaching of reading in Minnesota.
- * Evaluate strategies to support and reinforce the instruction of students in reading following written and oral lesson plans developed by licensed teachers.
- * Practice the use of technology in the learning and application of reading.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.

(2 C: 2 lect/pres, 0 lab, 0 other)

CACE 1474 - Strategies in Math for Paraprofessionals

This course is designed to provide students with the skills necessary to support and reinforce the instruction of K-6 students in the area of math. This course combines an understanding of how children learn math with the instructional strategies necessary to promote math education. In addition, students will examine the math skills and knowledge required of prospective and practicing paraprofessionals, and their ability to apply those skills and knowledge when assisting in classroom instruction.

Student Learning Outcomes:

- * Develop the ability to access and effectively use available resources for supporting teacher instruction in the subject of math.
 - * Identify effective developmental, age-appropriate, and culturally sensitive instructional strategies in math that support the instruction of licensed teachers.
 - * Demonstrate gathering and recording of data regarding student performance in the area of math using tools such as rubrics, curriculum-based measurement, and informal assessments.
 - * Define the terminology related to the instruction of math.
 - * Develop an understanding of how the Minnesota Standards and Testing (including state and local testing) direct the teaching of math in Minnesota.
 - * Demonstrate strategies to support and reinforce the instruction of students in math following written and oral lesson plans developed by licensed teachers.
 - * Practice the use of technology in the learning and application of math.
- Prerequisite(s): MATH0475 or MATH0485 or Appropriate Placement Score.
(2 C: 2 lect/pres, 0 lab, 0 other)

CACE 1476 - Writing Strategies for Paraprofessionals

This course is designed to provide students with the skills necessary to support and reinforce the instruction of K-6 students in the area of writing. This course combines an understanding of how children learn writing with the instructional strategies necessary to promote writing education. In addition, students will examine the writing skills and knowledge of writing required of prospective and practicing paraprofessionals, and their ability to apply those skills and knowledge when assisting in classroom instruction.

Student Learning Outcomes:

- * Identify effective developmental, age-appropriate, and culturally sensitive instructional strategies in writing that support the instruction of licensed teachers.
- * Develop the ability to access and effectively use available resources (including technology) for supporting teacher instruction in the subject of Writing.
- * Demonstrate the gathering and recording of data regarding student performance in the area of writing using tools such as rubrics, curriculum-based measurement, and informal assessments.
- * Define the terminology related to the instruction of writing.
- * Develop an understanding of how the Minnesota Standards and Testing (including state and local testing) direct the teaching of writing in Minnesota.
- * Create activities to support and reinforce the instruction of students in writing following written and oral lesson plans developed by licensed teachers.
- * Demonstrate the use of technology in the learning and application of writing.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.

(1 C: 1 lect/pres, 0 lab, 0 other)

CACE 1478 - Technology Strategies for Paraprofessionals

This course is designed to provide students with the skills necessary to support and reinforce the instruction of K-6 students in the area of technology. Students will utilize technology to gather and develop classroom lesson plans. In addition, students will examine assistive/augmentative technology and the knowledge of technology required of prospective and practicing paraprofessionals, and their ability to apply those skills and knowledge when assisting students.

Student Learning Outcomes:

- * Demonstrate how to access and effectively use available resources for supporting teachers in their use of technology and assistive/augmentative technology.
- * Identify effective developmental, age-appropriate, and culturally sensitive instructional strategies in technology and assistive/augmentative technology that support the instruction of licensed teachers.
- * Demonstrate how to gather and record data regarding student performance in the area of technology.
- * Define the terminology related to the instruction of technology and assistive/augmentative technology.
- * Apply strategies to support and reinforce the instruction of students using various types of technology while following the written and oral lesson plans developed by licensed teachers.
- * Analyze the technical skills needed to effectively use technology and assistive/augmentative technology with individual students.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(1 C: 1 lect/pres, 0 lab, 0 other)

CACE 1479 - Autism Spectrum Disorder (ASD)

The course instruction provides an overview of the characteristics of children and adults with Autism Spectrum Disorder. The course illustrates care-giving and classroom strategies to promote inclusion of children and adults into their communities.

Student Learning Outcomes:

- * Define the characteristics of Autism Spectrum Disorder.
- * Demonstrate sensitivity to beliefs, values and cultures.
- * Examine the types of resources available and organize a community resource list for families and professionals.
- * Learn a variety of educational modifications and accommodations and create an inclusive education/activity plan.

(1 C: 1 lect/pres, 0 lab, 0 other)

CACE 1480 - Caring for Children with Special Health Needs

This course introduces medical terminology and basic concepts of support care related to children with special health and medical needs. The purpose of this course is to provide basic knowledge on a variety of medical disabilities and how these medical issues affect a child's care. This information will be used to determine if a person needs short-term or long-term intervention and support in the early child care, school and after school setting.

Student Learning Outcomes:

- * Implement Standard Precautions and describe Administering Medication Safety Standards while caring for children with special health conditions.
- * List the principles of basic body mechanics and demonstrate handling, transferring, range of motion, positioning techniques and various adaptive tools and technology to enhance a child's independence.
- * Describe the care and support practices for a child with an urinary catheter.
- * Utilizing current terminology, describe the care for a child with diabetes following health care directives.
- * Identify common feeding abnormalities in relationship to sensory disorders and appropriate intervention practices.
- * Identify the types of seizures and the implementation of directives as written in the seizure response plan.
- * Identify where intravenous (IV) needles, ports, urinary catheters and respiratory treatments are located on the body.
- * Demonstrate cultural sensitivity to meet children's health and medical needs.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(2 C: 2 lect/pres, 0 lab, 0 other)

CADD 1502 - AutoCAD Foundations

This course provides an introduction to the creation of 2D graphics with AutoCAD software. A guided lab approach to constructing basic drawings for industry

related parts, utilizing a variety of AutoCAD commands will be used. A hands-on, exercise intense process to drawing and part creation will be taken. Students will establish a basis for creating 2D, multi-view drawings that meet industry standards. Applications utilized include data storage, file maintenance and outputting drawings to printers and/or plotters.

Student Learning Outcomes:

- * Manipulate AutoCAD geometric construction commands.
- * Utilize the AutoCAD modify and layers functions.
- * Employ the use of the zoom, pan, object selection and object properties.
- * Apply dimensions, notes and text to multi-view drawings.
- * Set up drawing layout/template and create Multi-view drawings.
- * Generate completed drawing in hard copy form.
- * Store, transfer, and retrieve data in a variety of CADD formats.

(3 C: 1 lect/pres, 2 lab, 0 other)

CADD 1507 - Drawing Principles I

This is a further study of Computer-Aided Drafting. Drawing creation will be done by the use of absolute, relative and polar coordinates and will examine advanced CAD capabilities used in creating complex multi-view drawings with 2D and solid modeling software, as well as the creation of blocks with attributes.

Student Learning Outcomes:

- * Demonstrate the use of standard dimensioning rules and terms.
- * Produce complex multi-view drawings according to industry standards.
- * Create and modify complex detail part drawings and 3 dimensional objects.
- * Utilize dimensional notes to call out various machine element features.
- * Create blocks with attributes.

(3 C: 1 lect/pres, 2 lab, 0 other)

CADD 1512 - Inventor Foundations

This course provides an introduction to Inventor parametric modeling software. A guided lab approach is used to construct basic models, basic mechanical designs, and create multi-view drawings that conform to industry standards. A hands-on, exercise intense approach to the parametric modeling techniques and concepts will be taken. Students explore the parametric modeling process and learn about the growing field of Mechanical Design.

Student Learning Outcomes:

- * Demonstrate the setup/startup for a new model/drawing to be created.
- * Utilize the 2D sketching functions of the software.
- * Construct solid model geometry/features from 2D sketches.
- * Create placed features on a model.
- * Demonstrate the ability to modify features and 2D sketches.
- * Produce 2D multi-view drawings from a models.
- * Apply Dimensions, notes and text to drawings.
- * Use printer/plotter to create drawing hardcopies.

(3 C: 1 lect/pres, 2 lab, 0 other)

CADD 1516 - Drawing Principles II

This is an introduction to different components of engineering drawings. It also includes the creation of views needed to give greater detail for complex part drawings as well as techniques used to create unique geometric features of some parts. These components and techniques will be covered using both 2D and solid modeling applications. Students will be introduced to the process used for creating assemblies in the solid model environment.

Student Learning Outcomes:

- * Create part features requiring the use of geometric construction.
- * Navigate vendor documentation and extract needed information.
- * Determine tolerances for mating parts.
- * Apply tolerances to part features.
- * Create drawings of fasteners.
- * Create and label part features related to the application of fasteners.
- * Generate a variety of different types of section views.
- * Create small assemblies using solid modeling software.

(3 C: 1 lect/pres, 2 lab, 0 other)

CADD 1520 - SolidWorks Foundations

This course delivers an introduction to Solidworks parametric modeling software. Students construct basic models, basic mechanical designs, multi-view drawings and assembly models. A solid model is more than simply a drawing of an engineered component, it is a true virtual representation of the component, which

can be manipulated, combined with other components into assemblies and used to drive the production of the components and the final assembly. A hands-on, exercise intense approach to the parametric modeling techniques and concepts will be taken. The course will establish a basis for exploring the parametric modeling process and growing in the field of Mechanical Design.

Student Learning Outcomes:

- * Demonstrate the startup of the software and the setup for a new model/drawing to be created.
 - * Utilize the 2D sketching functions of the software.
 - * Construct solid model geometry/features from 2D sketches.
 - * Create placed features on a model.
 - * Demonstrate the ability to modify features and 2D sketches.
 - * Produce 2D multi-view drawings from models.
 - * Create an assembly and establish the assembly relationships between the parts.
 - * Apply dimensions notes and text on drawings.
- (3 C: 1 lect/pres, 2 lab, 0 other)

CADD 1523 - Design Calculations I

This is an exploration into the principles of force, motion, work, power, energy, simple machines, thermodynamics and the properties of solids and liquids. The application of knowledge will be through experimentation and problem solving. Student Learning Outcomes:

- * Calculate unknown information dealing with motion
 - * Determine unknown vector information.
 - * Calculate simple work, power and energy problems.
 - * Solve situations dealing with simple machines.
 - * Determine unknown information when dealing with the effects of heat on materials.
 - * Calculate design information based on the properties of solids and liquids.
- (3 C: 1 lect/pres, 2 lab, 0 other)

CADD 1530 - Basic Electric Circuits

This course will give students a fundamental understanding of electrical circuits, basic components of an electrical circuit, electricity flow and an explanation of the basic units used to measure electricity. The course will cover principles of AC, DC electricity and basic rules for calculating voltage, current, resistance and power. Students will examine the basic principles of interpreting electrical prints, and will be given an overview of various meters used in electrical maintenance. Student Learning Outcomes:

- * Describe the foundational principles and components of AC/ DC electric circuits.
 - * Explain basic principles and proper usage of various meters.
 - * Calculate power, voltage, current, resistance values for basic circuits.
 - * Interpret basic electrical prints.
- (1 C: 1 lect/pres, 0 lab, 0 other)

CADD 2505 - Advanced Drawing Principles I

This is a further introduction to different components of engineering drawings. Students will be introduced to the common techniques used in the sketching of objects which are used to help communicate ideas to others. The course will also cover the creation of in-house layouts and how information and geometry in these layouts are used in the creation of production drawings. Some of these components and techniques will be covered using both 2D and solid modeling applications.

Student Learning Outcomes:

- * Create isometric sketches of objects.
 - * Create a design layout.
 - * Calculate critical dimensions for design layout.
 - * Apply surface finishes to drawings.
 - * Prepare detail drawings requiring auxiliary views.
 - * Document revisions on existing drawings.
- (3 C: 1 lect/pres, 2 lab, 0 other)

CADD 2509 - Advanced Drawing Principles II

This course will provide students with the knowledge and skills to create bolted and welded assembly drawings using 2D and solid modeling software.

Student Learning Outcomes:

- * Identify common parts of welding symbols

- * Create bolted and welded assembly drawings
 - * Formulate parts list for drawings
 - * Demonstrate timeliness in finishing assignments
 - * Treat classmates with respect
- (3 C: 1 lect/pres, 2 lab, 0 other)

CADD 2510 - Design Concepts

Students will examine the relationships between product functions, design, quality control and manufacturing techniques. Students will discuss and apply practical geometric, dimensioning to industry drawings.

Student Learning Outcomes:

- * Develop design layouts
- * Analyze the design layout function
- * Create and evaluate design options
- * Integrate machine elements into design
- * Evaluate tolerance and fit application as they relate to production and cost
- * Demonstrate the ability to respect others and their ideas
- * Structure and utilize time effectively to meet deadlines

Corequisite(s): CADD2514, CADD2522

Prerequisite(s): CADD2509.

(3 C: 1 lect/pres, 2 lab, 0 other)

CADD 2514 - Computer- Aided Design

This course deals with constructing a drawing portfolio for a completed design. Detail and design drawings are developed with emphasis on accuracy, tolerances, surface finishes, notes, system design and symbol diagrams.

Student Learning Outcomes:

- * Evaluate design for manufacturability
- * Analyze the design for function
- * Identify and incorporate safety requirements
- * Evaluate the design for maintenance and appearance requirements
- * Prepare related technical documents associated with the completed design
- * Treat fellow classmates with respect
- * Demonstrate ability to structure and utilize time effectively to meet deadlines
- * Apply practical machine design elements and use of vendor catalogs

Corequisite(s): CADD2510, CADD2522

Prerequisite(s): CADD2509.

(3 C: 1 lect/pres, 2 lab, 0 other)

CADD 2518 - Design Calculations II

This is an introduction of how the size of a component and the type of material used is determined.

This is partially done through the study of how forces are distributed through components and determining a components center of gravity. Using this information one can reference different materials properties such as the 3 basic types of stress, strain and modulus of elasticity and make necessary decisions in the design of components.

Student Learning Outcomes:

- * Determine unknown values in concurrent-coplanar force systems.
- * Calculate stress and strain on components.
- * Determine unknowns in parallel force systems.
- * Calculate shear forces along the length of a beam/shaft.
- * Calculate bending moments along the length of a beam/shaft.
- * Determine components cross sectional area.

Prerequisite(s): PHYS1300 or PHYS1305, CADD1523.

(3 C: 1 lect/pres, 2 lab, 0 other)

CADD 2522 - Machine Design

This course will examine the design and function of common machine elements, such as bearings, shafts, belt and chain drives, lubrication, fasteners and springs. Students will also consider more comprehensive design problems in the area of machine design. Upon completion of this course the student will have an understanding of the broad field of activities identified by the term "Machine Design".

Student Learning Outcomes:

- * Analyze part failure
- * Assess requirements for friction and antifriction bearings
- * Perform calculations for shaft, coupling and key design
- * Analyze the design and application of spur gears

- * Calculate power transfer for belt and chain drive systems
- * Assess applications of mechanical fasteners and the design of power screws
- * Analyze and apply equations for the design of various spring types
- * Employ fluid power principles for cylinders and control valves
- * Demonstrate the ability to respect others and their ideas
- * Manage and utilize time effectively to meet deadlines

Corequisite(s): CADD2510, CADD2514

Prerequisite(s): CADD2518.

(3 C: 1 lect/pres, 2 lab, 0 other)

CADD 2529 - Manufacturing Systems

This course will provide many opportunities to study the basic elements of manufacturing as a managed body of activities. These basic elements are arranged under two major categories: materials and processing and management.

Student Learning Outcomes:

- * Examine metallic material types and classifications
- * Explore methods of metal, plastic, ceramic and composite material processing, conditioning and finishing
- * Examine various casting methods
- * Investigate different methods of lean manufacturing
- * Participate in industry tours
- * Apply fundamental statistical analysis of measurements to verify the quality of a design or process
- * Manage time and meet deadlines
- * Demonstrate the ability to respect others and their ideas

(2 C: 1 lect/pres, 1 lab, 0 other)

CADD 2532 - Geo-Dim for Designers

This is an introduction to the basics of the Geometric Dimensioning and Tolerancing standards (ASME Y14.5). It is another way to communicate with manufacturing and engineering staff what degree of accuracy and precision is needed on each facet of a part or assembly. The proper creation and placement of symbols are emphasized. Theoretical and practical concepts of each of the geometric controls are explained relative to design and function.

Student Learning Outcomes:

- * Explain what each geometric characteristic controls.
- * Define what datums is.
- * Designate datums on detail drawings.
- * Determine which geometric characteristic should be used for different situations.
- * Apply geometric tolerances of form, profile, orientation, runout and location to drawings.
- * Calculate tolerance values for hole locations.
- * Determine material conditions for internal and external features.
- * Organize geometric symbols on a drawing for maximum readability.

Prerequisite(s): CADD1516.

(2 C: 1 lect/pres, 1 lab, 0 other)

CADD 2541 - Mastercam Fundamentals

This course provides an introduction to Mastercam software. Students will gain an introductory understanding of computer assisted CNC (computer numeric controlled) programming software. A guided lab approach to construction of 2D geometry and toolpaths for lathe and mill applications will be used. Students will operate CNC equipment in a lab setting, while exercising safe lab practices.

Student Learning Outcomes:

- * Manipulate basic 2D geometry for lathe and milling machine using Mastercam software.
- * Input data for tool selection, speeds and feeds of machines.
- * Develop tool paths and CNC program for lathe and milling machine.
- * Generate basic g-codes using post processors for the mill and lathe.
- * Produce projects using CNC mill and lathe.
- * Exercise safe practices when using lab equipment.

Prerequisite(s): CADD1502.

(2 C: 0 lect/pres, 2 lab, 0 other)

CADD 2542 - Reverse Engineering

This course emphasizes the fundamentals of part documentation and production of professional quality engineering documents consistent with industry standards as a result of reverse engineering a product or component. The class will have

students using various types of inspection devices/tools. Students will disassemble mechanisms, measure and sketch parts, and record data. Students create assembly and detailed piece part drawings utilizing functional dimensioning practices. Creation of these drawings will help build a portfolio of engineering documents for potential employers.

Student Learning Outcomes:

- * Measure parts with inspection equipment.
- * Produce sketches of parts and record measurements and data.
- * Produce multi-view detailed piece part and assembly drawings according to industry standards.
- * Apply dimensions and tolerances with regard to functionality and in accordance with industry and manufacturing practices.
- * Select drawings to be inserted in a student portfolio.
- * Utilize the Metric and English measuring system.

Prerequisite(s): CADD2509.

(2 C: 0 lect/pres, 2 lab, 0 other)

CADD 2550 - Mechanical Design Technical Communications

This is a study of the different types of written communications in the technical field including the collection and presentation of technical data. While drawings are the main mode of communication for a drafter, there are several types of written documents they need to create on a weekly or monthly basis. In some of these documents technical drawings need to be created. These technical drawings give a more realistic look to parts and assemblies.

Student Learning Outcomes:

- * Create common documents that are used in the design department.
- * Perform a site visit and create a report.
- * Organize information by creating an outline.
- * Create an Operation and Maintenance Manual.

(1 C: 1 lect/pres, 0 lab, 0 other)

CADM 3502 - CMM Operations

Student will setup and perform flexible gauging operations on a stand-alone coordinate measuring machine (CMM). Inspection of piece-parts and fixtures will be done on the three axes. Students will do part-to-print inspection. Piece-parts and matching prints drawn in conventional and geometric dimensioning will be inspected to size and location tolerances, as well as other tolerancing such as runout, form and orientation where applicable.

Student Learning Outcomes:

- * Start up, calibrate and setup CMM
- * Probe part and compare generated data with drawing specifications
- * Create drawing from probed part
- * Create CMM program for specific part

Prerequisite(s): CADD2531.

(2 C: 1 lect/pres, 1 lab, 0 other)

CARP 1507 - Construction Tools, Equipment and Machines

Proper use and care of hand and power tools is critical to the success of the carpenter. With successful completion of this course the student will understand how to use and care for many hand and power tools. Because power and pneumatic tools can be dangerous to the user and others safety will be emphasized in this course.

Student Learning Outcomes:

- * Distinguish different carpentry hand and power tools for their proper uses.
- * Employ hand tools in a safe manner.
- * Employ power and pneumatic tools in a safe manner.
- * Demonstrate processes for maintaining hand and power tools.
- * Integrate safety practices while completing projects
- * Explain the importance of safety while using construction tools.
- * Demonstrate the safe use of ladders, scaffold and fall protection equipment.
- * Construct a safe, OSHA compliant work site including ladders, scaffolding, and fall protection.
- * List the OSHA requirements for the use of ladders, scaffold and fall protection.

(2 C: 1 lect/pres, 1 lab, 0 other)

CARP 1521 - Construction Principles

This course will enable the student to learn about materials and methods for footings, foundations, framing floors, walls, and rafters for residential and light commercial construction. The course will cover terms, techniques and layouts

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used. Estimating and materials used will also be emphasized.

Student Learning Outcomes:

- * Identify types of footings.
- * Identify types of foundations and the relationship to applicable building codes.
- * Examine waterproofing techniques.
- * Recognize residential layout and framing techniques.
- * Layout and frame floor systems.
- * Construct exterior and interior walls including layout and framing.
- * Estimating of materials.
- * Distinguish building codes and how applied.

(4 C: 1 lect/pres, 3 lab, 0 other)

CARP 1523 - Rafters and Stairs

The effective carpenter must be able to perform the calculations necessary to correctly layout and cut rafters and stairs. This course will take the learner through the steps necessary to understand the mathematical principles, materials and methods used in modern stair and rafter framing. The learner will be able to identify the building code requirements and safety concerns related to rafters and stairs.

Student Learning Outcomes:

- * Describe various roof designs.
- * Recognize the terms associated with roof framing.
- * Identify roof framing parts used in gable and hip roofs.
- * Identify the methods used to calculate the length of rafters.
- * Employ a framing square, a speed square, and a calculator to layout rafters.
- * Identify various types of sheathing used in covering roofs.
- * Estimate the materials used in framing and sheathing a roof.
- * Identify building code requirements pertaining to roofs.
- * Recognize the safety requirements pertaining to roof construction.
- * Identify the various types of stairs.
- * Identify the parts of a stairway.
- * Identify the materials used in stair construction.
- * Perform the calculations to determine the total rise, the number of risers and number and size of treads required for a stair.
- * Layout and cut a stair.
- * Estimate the materials required to build a stair.
- * Identify building code requirements pertaining to stairways

Prerequisite(s): CNST1502, CARP1507.

(3 C: 1 lect/pres, 2 lab, 0 other)

CARP 1524 - Rafters and Stairs

The effective carpenter must be able to perform the calculations necessary to correctly layout and cut rafters and stairs. This course will take the student through the steps necessary to understand the mathematical principles, materials, and methods used in modern stair and rafter framing. The student will be able to identify the building code requirements and safety concerns related to rafters and stairs.

Student Learning Outcomes:

- * Describe various roof designs.
- * Recognize the terms associated with roof framing and identify roof framing parts used in gable and hip roofs.
- * Apply the methods used to calculate the length of rafters.
- * Employ a framing square, a speed square, and a calculator to layout rafters.
- * Classify types of trusses and truss bracing.
- * Identify various types of sheathing used in covering roofs.
- * Estimate the materials used in framing and sheathing a roof.
- * Identify building code requirements pertaining to roofs.
- * Recognize the safety requirements pertaining to roof construction.
- * Identify the various types, parts, and materials of stairs.
- * Perform the calculations to determine the total rise, number of risers, number and size of treads for a stair.
- * Layout and cut a stair.
- * Estimate the materials required to build a stair.
- * Identify building code requirements pertaining to stairways.

Prerequisite(s): CNST1502, CARP1507.

(4 C: 1 lect/pres, 3 lab, 0 other)

CARP 1531 - Building Layout and Concrete

In residential construction the carpenter may be involved in the layout of the

building as well as building forms and placing concrete. This course introduces the learner to the equipment and techniques used to place a building or portion of a building on a site. The course will introduce the learner to the tools and techniques used in placing concrete as well as the ingredients that make up concrete.

Student Learning Outcomes:

- * Convert measurements in feet and inches to decimal equivalents.
- * Use layout equipment and procedures to make distance measurements and perform site layout.
- * Recognize, use and properly care for measuring instruments.
- * Record site layout data.
- * Establish 90-degree angles using the 3-4-5 rule.
- * Identify code and inspections requirements pertaining to building layout.
- * Identify foundation types and materials used in each.
- * Identify the ingredients in concrete and various types of concrete and their uses.
- * Calculate concrete quantities for various shapes.
- * Identify tools used in placing concrete.
- * Demonstrate the care of tools used in placing concrete.
- * Place and finish concrete.
- * Recognize safety concerns when working with concrete.

(3 C: 2 lect/pres, 1 lab, 0 other)

CARP 1538 - Cabinet Building and Estimating

The building and installation of cabinets requires great precision, attention to detail and the ability to use a variety of specialized tools. This course will introduce the learner to the materials and techniques used in cabinet making. The student will design, estimate materials for, build, and finish a cabinet. The proper use of power tools and tool safety will be emphasized.

Student Learning Outcomes:

- * Recognize the common materials used in cabinet making.
- * Correctly and safely use stationary power tools.
- * Identify the various joints used in cabinet making.
- * Design a cabinet project.
- * Estimate materials for a cabinet project.
- * Select the proper materials for a cabinet project.
- * Construct cabinet cases, doors and drawers.
- * Select and apply finishing materials.
- * Properly apply cabinet finishes.
- * Identify cabinet hardware.
- * Install a cabinet.
- * Install cabinet hardware.
- * Explore various countertop materials
- * Recognize safety concerns pertaining to cabinet construction and finishing.
- * Demonstrate professionalism

Prerequisite(s): CNST1502, CARP1507.

(4 C: 1 lect/pres, 3 lab, 0 other)

CARP 1540 - Blueprint Reading

This course introduces students to basic blueprint reading for residential construction. Students study and read a series of residential construction working drawings including floor plans, elevations, detail drawings, electrical, and plumbing.

Student Learning Outcomes:

- * Identify isometric, orthographic, oblique, and presentation drawings.
- * Understand blueprint terminology.
- * Recognize construction dimensioning techniques.
- * Interpret blueprints.
- * Comprehend construction specifications.

(2 C: 2 lect/pres, 0 lab, 0 other)

CARP 1545 - Interior Finish

The skills of a carpenter become most apparent in the interior finishing of a building. This course introduces the student to the materials, methods, and techniques used in the application of various interior finish materials including drywall, interior doors, moldings, baseboard, casing, and crown molding. Successful completion of the course will move the student forward in their journey to master the skills necessary to be a proficient carpenter.

Student Learning Outcomes:

- * Identify types of drywall and drywall fasteners and their uses.
- * Install drywall on wood and steel studs.
- * Recognize various types and sizes of interior doors.

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- * Identify and install various interior moldings.
- * Classify fasteners used in the installation of interior trim.
- * Install various interior doors and interior trim.
- * Install hollow metal doors and hardware.
- * Demonstrate safe work habits.

Prerequisite(s): CNST1502, CARP1507.

(3 C: 1 lect/pres, 2 lab, 0 other)

CARP 1550 - Exterior Finish

This course will enable the student to develop skills used to properly install windows, exterior doors, shingles, soffits and siding.

Student Learning Outcomes:

- * Identify and install materials used in roofing, cornice and siding work
- * Demonstrate how to make roof projections watertight.
- * Identify critical elements of the building exterior as they relate to water, vapor, and air intrusion.
- * Select and install flashings.
- * Estimate materials used in exterior finish.
- * Demonstrate safe work habits.
- * Explain the safety requirements for working on roof, ladders and scaffold.
- * Demonstrate professionalism.

Prerequisite(s): CNST1502, CARP1507.

(2 C: 1 lect/pres, 1 lab, 0 other)

CARP 1555 - Residential Construction Lab

This course provides advanced skill development in installation and maintenance of the building system. Students will practice these skills through layout and construction of floors, walls, and roofs, while gaining knowledge of the various installation methods and techniques. Students will perform window and door installation according to manufacturer specifications and Minnesota Building Code compliant processes. Students will develop the skill needed to spot job hazards and OSHA safety hazards. Students will learn best practices as identified by industry standards.

Student Learning Outcomes:

- * Demonstrate layout and framing of floors, walls, and roofs.
- * Analyze and prepare the building for installation of exterior materials.
- * Perform window and door installation per manufacturer's specifications and applicable building codes.
- * Demonstrate safe, OSHA compliant work habits.
- * Identify "punch list" items on the job site.
- * Identify safety hazards.

(3 C: 0 lect/pres, 3 lab, 0 other)

CHEM 1305 - Chemistry for the Non-Scientist

Meets MN Transfer Curriculum Goal Area 3 - This course is intended as a broad introduction to chemistry for the non-science major as well as for the allied health science major. Topics covered include the scientific method, atomic structure, the periodic table, bonding, acids and bases, nomenclature, equations, stoichiometry, gas laws, and oxidation and reduction. This course includes two hours of required lab per week. The laboratory introduces students to safe handling of chemicals, appropriate use of lab ware, and transcription of observations and data. Attendance in the first week lab safety session is mandatory.

Student Learning Outcomes:

- * Quantify measurements in the appropriate metric units as well as convert between the English and the metric system.
- * Identify and describe chemical and physical properties and changes.
- * Understand and use the Periodic Table to describe subatomic particles, predict types of bonding and ion formation, and to name compounds and molecules.
- * Represent molecular bonding in two and in three dimensions and predict molecular geometry.
- * Quantitatively and qualitatively describe chemical reactions and predict products of reactions.
- * Understand the submicroscopic differences in the three phases of matter and predict how that will affect macroscopic observations.
- * Apply appropriate laboratory ways and means including: recording, interpreting and reporting experimental observations as well as using laboratory equipment and chemicals safely.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.

(4 C: 3 lect/pres, 1 lab, 0 other)

CHEM 1340 - Introduction to General Chemistry

Meets MN Transfer Curriculum Goal Area 3 - Natural Sciences. This course is intended as a broad introduction to chemistry for the non-science major as well as for the allied health science major. Topics covered include the scientific method, atomic structure, the periodic table, bonding, acids and bases, nomenclature, equations, stoichiometry, gas laws, and oxidation and reduction. This course includes two hours of required lab per week. The laboratory introduces students to safe handling of chemicals, appropriate use of lab ware, and transcription of observations and data. Attendance in the first week lab safety session is mandatory.

Student Learning Outcomes:

- * Quantify measurements in the appropriate metric units as well as convert between the English and the metric system.
- * Identify and describe chemical and physical properties and changes.
- * Understand and use the Periodic Table to describe subatomic particles, predict types of bonding and ion formation, and to name compounds and molecules.
- * Represent molecular bonding in two and in three dimensions and predict molecular geometry.
- * Quantitatively and qualitatively describe chemical reactions and predict products of reactions.
- * Understand the submicroscopic differences in the three phases of matter and predict how that will affect macroscopic observations.
- * Apply appropriate laboratory ways and means including: recording, interpreting and reporting experimental observations as well as using laboratory equipment and chemicals safely.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.

(4 C: 3 lect/pres, 1 lab, 0 other)

CHEM 1342 - Organic and Biological Chemistry

Meets MN Transfer Goal 3 - Natural Sciences. This course is intended as an introduction to key concepts of organic and biological chemistry for the non-science major as well as for the allied health science major. Topics covered include nomenclature and characterization of hydrocarbons and functional groups, organic reactivity, classification and behavior of biochemicals including carbohydrates, lipids, amino acids, proteins, and nucleic acids. This course includes four hours of required lecture per week and two hours of required lab per week. The laboratory will apply concepts learned in lecture while introducing students to safe handling of chemicals, appropriate use of lab ware, and transcription of observations and data. Attendance in the first week during the lab safety is mandatory.

Student Learning Outcomes:

- * Identify and name hydrocarbons and organic compounds with functional groups
- * Predict and describe qualitatively and quantitatively common organic and biochemical reactions
- * Identify and describe the behavior of classes of biochemicals in living systems
- * Demonstrate an understanding of the relationship of submicroscopic form with macroscopic function in organic and biochemicals
- * Relate organic and biochemistry topics to everyday life

Prerequisite(s): CHEM1340.

(5 C: 4 lect/pres, 1 lab, 0 other)

CHEM 1350 - General Chemistry I

Meets MN Transfer Curriculum Goal Area 3 Natural Sciences. This is the first course in a two-semester sequence that, upon completion of the sequence, meets the general chemistry requirements for the Biology (Minnesota State Transfer Pathway) AS degree. Fundamental chemical concepts including measurements, nomenclature, atomic and molecular structure, chemical reactions, thermochemistry and the behavior of gasses are explored. This course includes two hours of required lab per week. Attendance in the first week lab safety session is mandatory.

Student Learning Outcomes:

- * Demonstrate basic knowledge and understanding of the fundamentals of experimental and theoretical chemistry.
- * Explain and apply skills in analytical thinking and problem solving, and apply scientific methods to experimental data.
- * Demonstrate skills in laboratory operations including making accurate and precise measurements, preparing solutions, operating instrumentation, experimental design, and the interpretation and reporting of quantitative and qualitative data and results.
- * Communicate their own data and analysis in oral and written communications that uses tables and graphs, describes detailed experimental procedures, and

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clearly explains conclusions, in order to create clear and compelling papers, posters, or presentations.

* Work both independently and collaboratively in the classroom and in the laboratory.

* Apply learned concepts to everyday situations and experiences and critically evaluate contributions to science reported in the media; identify valid approaches to scientific problem solving and reporting.

Prerequisite(s): CHEM1340, and MATH0475 or Appropriate Placement Score.
(4 C: 3 lect/pres, 0.5 lab, 0.5 other)

CHEM 1355 - General Chemistry II

Meets MN Transfer Curriculum Goal Area 3 Natural Sciences. This is the second course in a two-semester sequence that, upon completion of the sequence, meets the general chemistry requirements for the Biology (Minnesota State Transfer Pathway) AS degree. Topics covered include intermolecular forces of liquids and solids, properties of solutions, chemical kinetics, equilibrium, and nuclear chemistry. This course includes two hours of required lab per week. Attendance in the first week lab safety session is mandatory.

Student Learning Outcomes:

* Demonstrate basic knowledge and understanding of the fundamentals of experimental and theoretical chemistry.

* Explain and apply skills in analytical thinking and problem solving, and apply scientific methods to experimental data.

* Demonstrate skills in laboratory operations including making accurate and precise measurements, preparing solutions, operating instrumentation, experimental design, and the interpretation and reporting of quantitative and qualitative data and results.

* Communicate their own data and analysis in oral and written communications that uses tables and graphs, describes detailed experimental procedures, and clearly explains conclusions, in order to create clear and compelling papers, posters, or presentations.

* Work both independently and collaboratively in the classroom and in the laboratory.

* Apply learned concepts to everyday situations and experiences and critically evaluate contributions to science reported in the media; identify valid approaches to scientific problem solving and reporting.

Prerequisite(s): CHEM1350.

(4 C: 3 lect/pres, 0.5 lab, 0.5 other)

CMAE 1502 - 360 Degree Technical Mathematics

This is an introductory technical math course. The course is designed for students who have basic math skills and for those you need a review of basic technical math concepts. The primary goals of this course are to help individuals acquire a solid foundation in the basic skills of math/shop algebra and geometry. This course will show how these skills can model and solve authentic real-world problems. This is a blended on-line course utilizing Tooling "U", D2L and proctored unit exams.

Student Learning Outcomes:

* Solve practical problems in all topic areas

* Demonstrate and apply critical thinking skills to solve a variety of problems

* Utilize a systematic approach to problem solving

* Demonstrate the ability to work online and be self motivated to meet deadlines for assignments and tests

* Demonstrate effective use of resources including faculty, reference materials, industry sources, and the Internet

* Exhibit the use of a scientific calculator

Prerequisite(s): MATH0380 or MATH0400.

(3 C: 3 lect/pres, 0 lab, 0 other)

CMAE 1506 - Intro to Computer Technology

This course has 2 parts. Part 1 covers the use of D2L and e-mail, eFolio, Smarthinking and Research, and Computer Security. Part 2 of the course is an overview of Windows XP and the Microsoft Office 2007 software suite including MS Word, Excel, Access and PowerPoint.

Student Learning Outcomes:

* Use D2L to access and submit coursework, quizzes, communication, and grades

* Access student e-mail services to send and receive e-mail including attachments

* Set up an efolio account, customize a personal efolio, and include appropriate artifacts

* Access Smarthinking and other Library Research Services to conduct research

* Explain appropriate and available security measures in maintaining a personal computer

* Use the Windows XP operating system to create and manage files and folders

* Create and edit MS Word 2007 documents

* Create and edit MS Word Excel 2007 spreadsheets with formulas

* Design, create, and use MS Access 2007 database and associated tables

* Create MS Power Point 2007 presentations

(2 C: 1 lect/pres, 1 lab, 0 other)

CMAE 1510 - Print Reading

This course will orient the student in the basic skills and abilities required for understanding prints utilized in a manufacturing/industrial environment. Emphasis will be on interpretation of Geometric Dimensioning and Tolerancing symbols/principles; Alphabet of lines; Multi-view drawing (including Orthographic Projection, Isometric Views and Perspective Drawing); Title blocks; Revision systems; identification of general/local notes; Dimensions and tolerances; Basic principles of math/geometry in relation to mechanical print reading; interpretation of basic weld symbols; Techniques of basic shop sketching and interpretation of three-dimensional drawings, will also be discussed. Each student will have the opportunity to apply the knowledge acquired through a variety of in-class activities and external assignments.

Student Learning Outcomes:

* Define basic blueprint terminology

* Differentiate between general and local notes

* Interpret common abbreviations and terminology

* Determine tolerances associated with dimensions on a drawing

* Identify types of lines within a drawing

* List essential components found in title and revision blocks

* Identify isometric views

* Identify positions of views: top, front, side, auxiliary, and section

* Visualize one or more views from a given isometric of pictorial representation of an object, or from an actual object

* Determine the scale of the view or section

* Check for revisions

(2 C: 2 lect/pres, 0 lab, 0 other)

CMAE 1514 - Safety Awareness

This course is designed to align with the Manufacturing Skill Standards Council's (MSSC) assessment and certification system for Safety. The course curriculum is based upon federally-endorsed national standards for production workers. This course will introduce OSHA standards relating to personal protective equipment, Hazard Communication, tool safety, confined spaces, electrical safety, emergency response, lockout/tagout, and others.

Student Learning Outcomes:

* Work in a safe and effective manufacturing workplace

* Perform environmental safety inspections

* Perform emergency drills

* Identify unsafe condition and take corrective action

* Provide safety orientation for other employees

* Train personnel to use equipment safely

* Suggest processes and procedure that support safety in the workplace

* Fulfill safety and health requirements for maintenance, installation and repair

* Monitor equipment and operator performance

* Utilize effect safety enhancing workplace practices

(2 C: 2 lect/pres, 0 lab, 0 other)

CMAE 1518 - Manufacturing Processes

This course is designed to align with the Manufacturing Skill Standards Council's (MSSC) assessment and certification system for Manufacturing Processes. The course curriculum is based upon federally-endorsed national standards for production workers. This course emphasized, Just-In-Time (JIT) manufacturing principles, basic supply chain management, communication skills, and customer service.

Student Learning Outcomes:

* Identify customer needs

* Determine resources available for the production process

* Set up equipment for the production process

* Set team production goals

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- * Make job assignments
 - * Coordinate work flow with team members and other work groups
 - * Communicate production and material requirement and product specifications
 - * Perform and monitor the process to make the product
- (2 C: 2 lect/pres, 0 lab, 0 other)

CMAE 1530 - 360 Degree Machining Math

This is a math course designed for students in a machine shop environment. The primary goals of this course are to help individuals acquire a solid foundation in the basic skills of math that relate directly to the machine shop and industrial manufacturing. This course will show how these skills can model and solve authentic real-world problems. This is a blended on-line course utilizing Tooling "U", D2L and proctored unit exams.

Student Learning Outcomes:

- * Solve practical problems in all topic areas
- * Demonstrate and apply critical thinking skills to solve a variety of problems
- * Utilize a systematic approach to problem solving
- * Demonstrate the ability to work online and be self motivated to meet deadlines for assignments and tests
- * Demonstrate effective use of resources including faculty, reference materials, industry sources, and the Internet
- * Exhibit the use of a scientific calculator

Prerequisite(s): CMAE1502.

(2 C: 2 lect/pres, 0 lab, 0 other)

CMAE 1532 - Machine Tool Print Reading

This course covers the principles of mechanical print reading. Course includes sketching, lines, dimensioning and tolerancing, and single/multi-view drawings.

Student Learning Outcomes:

- * Develop an understanding of pictorial and orthographic projection drawings
- * Proficiency in understanding dimensioning and print specifications
- * Determine view location in first and third angle projection
- * Decipher thread representation in both inch and metric threads
- * Solve practical problems in all topic areas
- * Demonstrate and apply critical thinking skills to solve a variety of problems
- * Demonstrate the ability to work online and be self motivated to meet deadlines for assignments and tests

Corequisite(s): CMAE1510

(2 C: 2 lect/pres, 0 lab, 0 other)

CMAE 1534 - Machine Tool Technology Theory

This course will address the machining theory related to the safety and operation of basic machine tools including; drill press, vertical milling machine, engine lathe, precision and non-precision grinders, saws and precision measuring equipment. This is a blended on-line course utilizing Tooling "U" and D2L.

Student Learning Outcomes:

- * Knowledge of safe work habits around all metalworking equipment and co-workers
- * Perform speed and feed calculations
- * Understand the use of saws, grinders, and drill presses
- * Understand the use of mills and lathes
- * Describe proper machine tool operations
- * Describe use of precision measuring equipment
- * Demonstrate the ability to work online and be self motivated to meet deadlines for assignments and tests

(2 C: 2 lect/pres, 0 lab, 0 other)

CMAE 1536 - Machine Tool Technology Lab I

This course will address the setups and operation of a drill press, grinder, vertical milling machine, engine lathe, and saws. Machine safety, machine component identification, as well as turning, milling, sawing, bench work, drilling and single-point tool grinding projects are also included in the components listed above. The student will also learn the care and use of inspections and layout tools.

Student Learning Outcomes:

- * Application of safe work habits around all metalworking equipment and co-workers
- * Completion of milling projects on vertical milling machine
- * Completion of fundamental lathe operations on the engine lathe

- * Completion of bench work projects utilizing hand tools
- * Understand the importance of proper machine setup
- * Proficiency using various saws to complete machining projects
- * Completion of drilling projects on metalworking equipment
- * Proficiency in operation and setup of tool grinder
- * Proficiency in using precision measuring tools

Corequisite(s): CMAE1534

(2 C: 0 lect/pres, 2 lab, 0 other)

CMAE 1538 - Machine Tool Technology Lab II

This course will address the advanced operations of a drill press, vertical milling machine, engine lathe, surface grinder and saws. Machine safety as well as turning, milling, sawing, drilling and surface grinding projects are also included in the components listed above. The student will also learn the care and use of high precision measuring equipment.

Student Learning Outcomes:

- * Application of safe work habits around all metalworking equipment and co-workers
- * Completion of advanced milling projects on vertical milling machine
- * Completion of advanced lathe operations on the engine lathe
- * Understand the importance of proper machine setup and cutting tool usage
- * Proficiency using various saws to complete machining projects
- * Completion of drilling projects on metalworking equipment
- * Proficiency in using high precision measuring equipment
- * Completion of precision surface grinding projects

Prerequisite(s): CMAE1536.

(2 C: 0 lect/pres, 2 lab, 0 other)

CMAE 1540 - Introduction to CNC

This online course is an introduction to CNC Machining. The focus will center on CNC machining centers and will include the history of CNC machining, GandM codes, programming, set-up and operating procedures. The is an on-line course utilizing Tooling "U" and D2L.

Student Learning Outcomes:

- * Demonstrate the ability to edit a CNC program
- * Demonstrate the ability to create a manually written CNC program
- * Demonstrate and apply critical thinking skills to solve a variety of problems
- * Demonstrate the ability to work online and be self motivated to meet deadlines for assignments and tests
- * Demonstrate effective use of resources including faculty, reference materials, industry sources, and the Internet

(3 C: 3 lect/pres, 0 lab, 0 other)

CMAE 1542 - Geometric Dimensioning and Tolerancing

This course is designed to allow students to interpret the latest ANSY Y 14.5 drawing standard that applies to blueprint standards. Students will learn the symbols, rules and geometric controls shown on today's prints. Students will learn from given prints and exercises to enhance their skills in print reading.

Student Learning Outcomes:

- * Understanding of ANSI Y14.5 standards that affect geometric dimensioning and tolerancing applications
 - * Proficiency in using geometric dimensioning and tolerancing symbols and controls
 - * Decipher how piece-parts must be inspected if the features have GDandT controls and symbols
 - * Interpret a sketch or print with pertinent feature control frame and its contents based on written geometric requirements
 - * Decipher the correct precision tool(s) to inspect geometric requirements on a piece-part
 - * Determine the total tolerance of a feature using bonus and non-bonus tolerances
- (2 C: 2 lect/pres, 0 lab, 0 other)

CMAE 1560 - Interpreting Symbols

The Welding profession requires a good working knowledge of the fundamental component of welding prints that make up structures in the welding industry.

To accurately layout and fabricate parts, the welder will need basic knowledge of print lines, dimensions, notes, and welding symbols. The students will breakdown welding prints to develop the skills necessary to fabricate individual

component parts that will make-up welded structures. Written and Fundamental tests will be administered in accordance with the American Welding Society (AWS) and the appropriate correlating code books.

Student Learning Outcomes:

- * Interprets basic elements of a drawing or sketch.
- * Interprets welding symbol information and placement guidelines.
- * Nondestructive Examination (NDE) methods and symbol use.
- * Calculate weight and cost of welding consumables and materials
- * Prepares an applicable bill of materials.

(2 C: 2 lect/pres, 0 lab, 0 other)

CMAE 1562 - Oxyfuel Welding and Cutting Process

This course covers the use of oxy-fuel equipment while welding, cutting, brazing, and using the Plasma Arc Cutting (PAC) and Air Carbon Arc Cutting (CAC-A) processes. There will also be an introduction into laser cutting equipment. A very important part of this course will be discussing safety as it relates to the thermal welding and cutting equipment. Time will be spent in the lab developing skills, using the thermal welding and cutting processes. Welds will be made in the flat, horizontal, vertical, and overhead positions. Cuts will be made in the flat and horizontal positions. Written and Fundamental tests will be done in accordance with the American Welding Society (AWS) codes and standards.

Student Learning Outcomes:

- * Explain and identify the proper personal protection used in welding and cutting operations
- * Demonstrate safety habits consistent with industry standards and college policy
- * Show the ability to select, set up and operate the proper equipment proficiently
- * Determine the differences between gas welding, brazing, and soldering
- * Perform welds in the flat, horizontal, vertical, and overhead position with required processes
- * Determine the differences between plasma cutting, laser cutting and carbon arc cutting
- * Perform cutting applications with oxyfuel hand torch, motorized hand torch, track torch, carbon Arc cutting, and plasma cutting
- * Research and identify the welding and cutting applications within the welding industry

(3 C: 1 lect/pres, 2 lab, 0 other)

CMAE 1564 - Shielded Metal Arc Welding (SMAW)

Students will study the safety concerns connected with the Shielded Metal Arc Welding (SMAW) process, along with the an introduction into the types of power sources used for arc welding, process applications, electrode selections, overview of weld types, and other work-related safety conditions in the welding field. Time will be spent in the lab developing skills using the SMAW processes. Welds will be made in the flat, horizontal, vertical, and overhead positions. Written and Fundamental tests will be done in accordance with the American Welding Society (AWS) codes and standards.

Student Learning Outcomes:

- * Explain and identify proper personal protection used during welding
- * Demonstrate safety habits consistent with industry standards and college policy
- * Show the ability to select, set up, and operate the proper equipment proficiently
- * Identify the various types of power sources and the type of current produced by each one
- * Explain the characteristics that set welding apart from other joining processes
- * Identify factors that affect electrode selection
- * Demonstrate the ability to determine weld quality, and determine if they meet American Welding Society codes and standards
- * Perform welds in the flat, horizontal, vertical, and overhead positions with required electrodes
- * Research and identify the welding applications of the SMAW process within companies

(3 C: 1 lect/pres, 2 lab, 0 other)

CMAE 1566 - Gas Metal Arc Welding (GMAW) Flux Cored Arc Welding (FCAW)

Students will study the safety concerns connected with the Gas Metal Arc Welding (GMAW) and Flux Cord Arc Weld (FCAW). The GMAW process will be discussed in depth in relationship to the different type of modes of transfer available, shielding gases, and the different types of materials that can be welded. The FCAW process is similar in the type of equipment used for mode of transfer. The

differences in the electrode types of gas-shielded wires and self-shielded wires will be discussed along with the types of shielding gases that are used. There will be discussion on the importance of how the welding process intersects with the arc welding symbols and codes. Along with this, we will also do a review of procedures used in the visual inspections of welds. Time will be spent in the lab developing skills using the GMAW and FCAW processes. Welds will be made in the flat, horizontal, vertical, and overhead positions. Written and Fundamental tests will be done in accordance with the American Welding Society (AWS) codes and standards.

Student Learning Outcomes:

- * Explain and identify proper personal protection used in welding
- * Demonstrate safety habits consistent with industry standards and college policy
- * Show the ability to select, set up and operate the proper equipment proficiently
- * Identify the various types of power sources and the type of modes of transfer used
- * Distinguish GMAW and FCAW from each other and other welding processes
- * Identify common shielding gases and metals welded with the GMAW and FCAW processes
- * Define the importance of arc welding symbols and codes
- * Demonstrate the ability to determine weld quality by following procedures for visual inspections of welds
- * Perform welds in the flat, horizontal, vertical, and overhead positions with required processes
- * Research and identify how companies use the GMAW and FCAW processes

Prerequisite(s): CMAE1564.

(3 C: 1 lect/pres, 2 lab, 0 other)

CMAE 1568 - Gas Tungsten Arc Welding (GTAW)

This course covers the safety hazards and applications for Gas Tungsten Arc Welding (GTAW) in the welding industry. Material covered in the classroom will be power sources, setup, types of current, current selection, shielding gases and torch types. Various procedures will be discussed for welding different metals (Aluminum, Stainless Steel, and Mild Steel) ad potential problems that may be encountered. Applications for the process in different industries, and the use of back purging and its application will also be discussed. Welds will be made in the flat, horizontal, vertical and overhead positions. Written and Fundamental tests will be done in accordance with the American Welding Society (AWS) codes and standards.

Student Learning Outcomes:

- * Explain and identify proper personal protection used in welding
- * Demonstrate safety habits consistent with industry standards and college policy
- * Show the ability to select, set up, and operate the proper equipment proficiently
- * Distinguish the GTAW process from other arc welding processes
- * Identify the various types of power sources, types of current, and applications
- * Distinguish between the appropriate metal transfer modes for welding aluminum
- * Distinguish between the mechanical and physical properties of ferrous and nonferrous metals
- * Explain the proper electrode preparation and how it affects the weld for ferrous and nonferrous metals
- * Perform welds in the flat, horizontal, vertical, and overhead positions with required materials
- * Research and identify the welding applications of the GTAW process within companies

Prerequisite(s): CMAE1564, CMAE1566, CMAE1570.

(3 C: 1 lect/pres, 2 lab, 0 other)

CMAE 1570 - Metallurgy and Mechanical Properties of Materials

This course covers the study of metals and how the effects of welding and heat treatment affect them. Terminology dealing with metallurgy will be an important part of this course. Physical and mechanical properties of ferrous and nonferrous metals will be covered along with the classifications of the different types of metals. By understanding the mechanical properties of metals, you will gain an understanding of the range of usefulness of the materials in the metal working community. Written tests will be done in accordance with the American Welding Society (AWS) codes and standards.

Student Learning Outcomes:

- * Develop an understanding of the terminology used in the study of metals

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

- * Gain an understanding of the evolution of metals and how their use has affected our lives
 - * Describe the types of tests that are performed on metals to determine their range of usefulness
 - * Gain an understanding of the importance of selecting the proper metal for specific applications
 - * Determine the difference between ferrous and nonferrous metals, and how the applications will vary
 - * Explain how the heat of the welding process and heat treatments will affect various metals, and how the addition of alloys will change the effect of heat
 - * Identify the variables that determine the properties of the different metal classifications
- (1 C: 1 lect/pres, 0 lab, 0 other)

CMDE 1500 - Two Dimensional CADD

Students will develop knowledge of system configuration, hardware operations and interactive graphics software and will input drafting commands to develop drawings, store data and output drawings to the plotter for hard copy.

Student Learning Outcomes:

- * Perform start up and shut down procedures for computer software.
- * Manipulate the drawing software.
- * Set up drawing layout and create basic drawings.
- * Generate completed drawing in hard copy form.
- * Store, transfer, and retrieve data in a variety of CADD formats.
- * Demonstrate the ability to respect others and their ideas.

(3 C: 1 lect/pres, 2 lab, 0 other)

CMDE 1504 - Inventor Foundations

The primary goal of this course is to introduce students to the aspect of creating components with Inventor parametric modeling software. The course will guide you through constructing basic models, basic mechanical designs, creating multi-view drawings and assembly models. A solid model is more than simply a drawing of an engineered component, it is a true virtual representation of the component, which can be manipulated, combined with other components into assemblies and used to drive the production of the components and the final assembly. We will take a hands-on, exercise intense approach to the parametric modeling techniques and concepts. As an introductory course it is intended to help the student establish a basis for exploring the parametric modeling process and growing in the exciting field of Computer Aided Engineering.

Student Learning Outcomes:

- * Demonstrate the startup of the software and the setup for a new model/drawing to be created.
- * Utilize the 2d sketching functions of the software to construct solid model geometry.
- * Create placed features on a model.
- * Produce a 2 dimensional multi-view drawing from a model according to industry standards.
- * Utilize dimensional notes to call out various machine element features.
- * Define and demonstrate the use of standard dimensioning rules and terms.
- * Create an assembly and establish the assembly relationships between the parts.
- * Demonstrate the ability to meet deadlines, work independently and respect others.

(3 C: 1 lect/pres, 2 lab, 0 other)

CMDE 1508 - Mechanical Drafting Foundations

This course is a further study of Computer-Aided Drafting. Students will input drawings using absolute, relative and polar coordinates and will examine advanced CAD capabilities such as complex multi-view drawings, libraries and attributes using 2D and solid modeling software.

Student Learning Outcomes:

- * Demonstrate the use of standard dimensioning rules.
- * Produce complex multi-view drawings according to industry standards.
- * Create and modify complex detail part drawings and 3 dimensional objects.
- * Utilize dimensional notes to call out various machine element features.
- * Create Blocks, Attributes, and Symbol Libraries.
- * Demonstrate timeliness in finishing assignments.
- * Treat classmates with respect.

Prerequisite(s): CMDE1504.

(3 C: 1 lect/pres, 2 lab, 0 other)

CMDE 1512 - Intermediate Mechanical Drafting

This course provides information for completing engineering drawings including geometric construction, sections, fasteners, and tolerances and fits using 2D and solid modeling software as well as 3D assemblies.

Student Learning Outcomes:

- * Create drawings using geometric construction.
- * Generate section views.
- * Create drawings of fasteners.
- * Determine tolerances for mating parts.
- * Apply tolerances to part features.
- * Create 3D Assemblies.
- * Demonstrate timeliness in finishing assignments.
- * Treat classmates with respect.

Prerequisite(s): CMDE1504.

(3 C: 1 lect/pres, 2 lab, 0 other)

CMSC 1203 - Structured Programming Logic

This course introduces students to the programming major and lays the foundation for continued skill development in programming. Students in this course will study a variety of program design tools, structures, object-oriented, and procedural methodologies. Using a mix of theory and practical application students will learn the introductory skills needed in structured program logic to continue in the programming major.

Student Learning Outcomes:

- * Develop basic skills to understand the programming process, including data hierarchy, flowcharts, pseudocode, variables and data types
- * Understand program structures and study concepts such as spaghetti code, sequence, decision and looping structures, priming reads and case structures
- * Implement documentation and design theory with external and internal documentation, modularization and logic to develop programs
- * Learn array concepts such as declaring, initializing, manipulating and sorting single and multi-level arrays
- * Draw flowcharts and write pseudocode to describe algorithms and solve programming problems
- * Use loops, decision structures and sequential structures to solve programming problems
- * Understand file maintenance including merging and master file/transaction file handling
- * Use single-level and multi-level control breaks to solve programming problems
- * Understand object-oriented, procedural and event driven models and methodologies

(3 C: 2 lect/pres, 1 lab, 0 other)

CMSC 1206 - Basic Networking/ Security

This course will cover basic concepts and terminology used in local area networks, including the Open Systems Interconnection (OSI) and Transmission Control Protocol/Internet Protocol (TCP/IP) models of networking. Fundamental problems associated with management of local area networks will be presented and solved. The student will be able to identify the hardware and software necessary to implement a local area network and address network security issues. This understanding of information security management and the technical components of security includes learning the history and terminology of security and an overview of how to manage information security issues through effective risk management, security design, and maintenance. The student will also create a functioning network using virtualization tools (Virtual Box or Hyper V) to better understand networking functionality and best practices.

Student Learning Outcomes:

- * Explain networking fundamentals.
- * Use virtualization technologies to create a functioning network.
- * Define how LAN and WAN communications work.
- * Analyze and select appropriate networking devices for connecting networks.
- * Develop and practice a process for connecting devices in a wireless network.
- * Perform resource sharing on a network.
- * Develop and implement a basic network design.
- * Organize a network maintenance and troubleshooting plan.
- * Describe the need for information security.
- * Explain the legal, ethical, and professional issues in information security.
- * Explain the concepts of risk management.

* Analyze, design, and implement a plan for physical and logical network security.

(3 C: 2 lect/pres, 1 lab, 0 other)

CMSC 1212 - Web Markup Language

This course will teach the student how to create web pages and sites using HTML, the markup language used by the Internet, as well as XHTML. Students will follow industry formatting standards by using Cascading Style Sheets (CSS3) to format web pages. JavaScript will give students the ability to make web pages dynamic and functional. Browsers, ftp clients and servers are additional tools that enable students to 'publish' their website to the Internet.

Student Learning Outcomes:

- * Develop a working knowledge of HTML and HTML5, JavaScript and CSS3.
- * Develop and build web pages using HTML, HTML5, JavaScript and CSS3.
- * Create dynamic web pages with JavaScript and JavaScript functions.
- * Create dynamic web pages with Asynchronous JavaScript and XML (AJAX).
- * Format web pages with Cascading Style Sheets (CSS).
- * Integrating Images, Image maps and multimedia into web pages.
- * Discuss XML documents, validation concepts and structure.
- * Discuss Bootstrap framework concepts.

(3 C: 2 lect/pres, 1 lab, 0 other)

CMSC 1215 - XML

XML is a language that allows information and services to be encoded with meaningful structure and semantics. Uses for XML include information exchange over the internet, server settings and project properties. Visual Basic, Java and other language are used to extract data from an XML document for further processing. XML fundamentals and concepts, architecture, information modeling, data extraction using DOM, SAX and XPATH styling, filtering, transformations and testing will be covered.

Student Learning Outcomes:

- * Recognize well-formed and valid XML documents
- * Apply namespaces in XML documents
- * Learn data manipulation and filtering techniques for XML data extraction from XML documents
- * Extract XML documents data using elements, text nodes, CDATA elements and attributes
- * Enforce XML document validation using DTD's and Schemas
- * Integrate Cascading Style Sheets to format XML documents when viewed as web pages
- * Implement DOM, SAX and XPATH processing of an XML document
- * Transform XML documents with XSLT
- * Apply functional programming in XML document conversion

Prerequisite(s): CMSC1203, CMSC1225.

(3 C: 2 lect/pres, 1 lab, 0 other)

CMSC 1216 - Database Modeling I

Databases are an integral part of computer applications. This course is an introductory database modeling course. Using a relational database, this course introduces the student to relational database concepts. Data definition language constructs as well as data manipulation concepts show the student how to insert, read, update and display data in the relational database management system.

Student Learning Outcomes:

- * Install and configure a relational database in a Virtual PC environment.
- * Employ database normalization techniques.
- * Create and maintain relational databases, tables and other objects using Structured Query Language (SQL).
- * Write SQL statements to create indexes, views, referential, entity, domain and user-defined constraints on database tables.
- * Write SQL statements and scripts to insert, delete, update and retrieve data in tables.
- * Write SQL statements to extract and manipulate data from database objects using joins.
- * Write SQL scripts to create stored procedures, triggers and user defined functions to retrieve, insert, update and delete data from SQL Server databases.
- * Determine differences between different relational databases as well as to how relational and ORM/NoSQL databases differ.
- * Explain user roles in a relational database environment.

Prerequisite(s): CMSC1203. (3 C: 2 lect/pres, 1 lab, 0 other)

CMSC 1217 - Data Analytics

The goal of data analytics is to gain knowledge and communicate conclusions drawn from data. This course provides an introduction to Business Intelligence (BI) using SQL Server. The class also provides an overview of advanced machine learning, data mining and statistical techniques that arise in data analytic applications. Throughout the course, the students will utilize BI tools and services, such as SQL Server Integration Services (SSIS), SQL Server Analysis Services (SSAS), SQL Server Reporting Services (SSRS) and Power BI. The course is targeted towards individuals who would like to apply the practices and potential use of large scale data analytics to data sets.

Student Learning Outcomes:

- * Identify the architecture and components of a Business Intelligence system
- * Differentiate between Business Intelligence Structures
- * Design and Implement Control and Data Flow
- * Apply SQL Server Data Tools, Libraries and Expressions to Analyze Data
- * Build and Perform Analysis of Data from In-Memory Databases
- * Analyze data using different processing methods
- * Illustrate Pattern Recognition
- * Apply Hierarchy Design Best Practices
- * Implement Administrative Security

Prerequisite(s): CMSC1203.

(3 C: 2 lect/pres, 1 lab, 0 other)

CMSC 1225 - Java Language I

Java is a programming language that is utilized extensively in the programming world. It is used to program applications, network programs, mobile devices and more. Students will learn the skills necessary for the effective and efficient creation of computer programs using Java as well as Java fundamentals and concepts, Java structures and testing. Students will complete exercises which include creating new programs as well as modifying existing code. The programs are developed using an Integrated Development Environment (IDE) on a virtual PC.

Student Learning Outcomes:

- * Create the Java programming environment by installing the JDK and JRE.
- * Construct Java programs using variables, structures, arrays, and other language constructs.
- * Construct Java programs using in-class agile programming methods.
- * Construct Java programs using object-oriented programming techniques.
- * Construct Java programs that process data from files.
- * Construct Java programs with an IDE.
- * Employ debugging techniques while working in Java programs.

Prerequisite(s): CMSC1212

(3 C: 2 lect/pres, 1 lab, 0 other)

CMSC 1255 - PHP

This course is an introduction to PHP, Hypertext Preprocessor. The students will be involved in writing HTML pages that incorporate PHP into them. This will enable the students to perform database connectivity from an HTML page, utilize the GD library and create graphics on their pages as well as learning the basics of the PHP language including variables, decision and loop structures and more. This will also enable the students to stay current with market demands for programmers. Dynamic web applications will be developed using HTML and PHP.

Student Learning Outcomes:

- * Implement PHP functions and include files in HTML pages
- * Define PHP data types
- * Understand the rules and types of variables in the PHP language
- * Understand decision and loop structures of the PHP language
- * Write and execute HTML/PHP pages/websites
- * Have basic knowledge of the GD library
- * Connect to a database with PHP from their HTML page

Prerequisite(s): CMSC1203.

(3 C: 2 lect/pres, 1 lab, 0 other)

CMSC 2201 - Database Modeling II

Database Modeling II is an advanced database modeling course designed to introduce the student to the management side of relational databases. This course builds on the skills learned in course prerequisites with a review of database maintenance and creation. Database administrator skill development will be the primary focus of this course with concentration in server administration. Advanced skill development in design, installation, configuration, maintenance, and

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analysis of performance will be highlighted throughout the course.

Student Learning Outcomes:

- * Create, configure, and maintain SQL Server databases, tables, views, constraints, indexes, queries with T-SQL scripts.
- * Distribute and partition data in SQL Server databases.
- * Import data from various sources into SQL Server databases and export data from SQL Server databases.
- * Design policies for SQL Server user groups.
- * Schedule jobs and alerts on SQL Server databases.
- * Analyze SQL Server performance monitoring and tuning.
- * Create and configure user permissions on SQL Server databases.
- * Design and implement data backup and recovery plans on SQL Server instances.
- * Install and query Spatial data databases.
- * Import XML data from various sources into XML Server databases and export XML data from SQL Server databases.
- * Extract, transform, and load JSON documents to be exported from SQL Server databases.
- * Use SQL Server in a Linux environment.

Prerequisite(s): CMSC1203, CMSC1216.

(3 C: 2 lect/pres, 1 lab, 0 other)

CMSC 2203 - C# Programming

C# is an object-oriented language from Microsoft. C# is programmed in the Visual Studios Integrated Development Environment (IDE) in a virtual environment. Object oriented methodology; various approaches to data access; C# language constructs and structures using C# will be covered in this class. Agile development is practiced when creating programs. Students learn this methodology by

participating in project-based, team-oriented groups while developing application. Students also learn team dynamics through changing project roles, meetings, demonstrations, and maintaining technical documentation for their projects.

Student Learning Outcomes:

- * Develop Visual Studios C# projects using the IDE.
- * Utilize C# programming language constructs to create Windows Presentation Foundation (WPF) applications.
- * Implement data access with Graphical User Interface (GUI) controls, text files and local and remote databases for WPF applications.
- * Integrate source control and unit testing into WPF applications.
- * Integrate agile programming practices while developing WPF applications.
- * Take part in project development techniques and iterations.
- * Analyze a project to determine how best to implement changes into the project.
- * Take part in different roles of project and team development using Agile development.

Prerequisite(s): CMSC1203.

(3 C: 2 lect/pres, 1 lab, 0 other)

CMSC 2204 - Mobile Device Programming/Connectivity

Mobile devices have become an integral part of the business world. Having the knowledge to program these devices will increase the programmer's value in the workplace. Thru mobile applications and XML, this course teaches the programmer to build applications that render intelligently on different devices. This course focuses on the Android mobile device.

Student Learning Outcomes

- * Navigate the Android emulator and the Eclipse development IDE
- * Develop mobile applications that demonstrate Android capabilities
- * Write 2D and 3D Android applications
- * Save user preferences in Android applications
- * Integrate data access into Android applications
- * Develop Android applications that consume Web services
- * Write Google map Android applications
- * Discuss other mobile application platforms

Corequisite(s): CMSC2202 Prerequisite(s): CMSC1203.

(3 C: 2 lect/pres, 1 lab, 0 other)

CMSC 2205 - Internship

This course is designed as a purposeful training and occupational experience for students in the computer programming field. The experience allows students to apply the knowledge, skills, and abilities acquired throughout the curriculum to a

work environment. Students will participate in 150 hours of computer programming related work and perform programming duties as assigned at a private or public sector organization while under the supervision of a site mentor and faculty member.

Student Learning Outcomes:

- * Accept responsibility for Computer Programming functions and personal behavior while at the internship site.
 - * Follow confidentiality policies and procedures while at internship site.
 - * Work within the team environment while at the internship site.
 - * Contribute to and prioritize work projects, policies and procedures in relation to job function with minimal supervision while at internship site.
 - * Consistently project good company image while at internship site.
 - * Implement learned programming languages, database concepts and development methodologies as determined by the site.
- (3 C: 0 lect/pres, 0 lab, 3 other)

CMSC 2206 - Python Programming

Python is an open-source, high-level, interpreted, object-oriented, powerful programming language. It promotes agile development through Rapid Application Development (RAD) by supporting multiple programming styles including object-oriented, imperative, functional and procedural programming. It promotes the use of Python modules and packages. Python can also be used as scripts in web applications as well as utilized in application programming.

Student Learning Outcomes:

- * Create a Python programming environment.
- * Write Python programs that integrate variables and constructs.
- * Integrate unit testing into Python programs.
- * Write Python programs to execute batch scripts.
- * Write Python programs to access and manage data.
- * Write Python programs to create web applications.
- * Write simple games and interactive projects for single-board computers using Python.
- * Integrate Python frameworks into Python web applications.

Prerequisite(s): CMSC1203.

(3 C: 2 lect/pres, 1 lab, 0 other)

CMSC 2220 - Cryptography

This class will focus on how to keep data safe. Security terminology as well as Internet terminology will be studied. The Transport layer of the ISO model is reviewed to demonstrate how packets are structured and sent. Programming techniques to incorporate data security into applications will be applied. Industry standards for data security will be reviewed. Client/Server applications will be developed to demonstrate how Internet applications communicate.

Student Learning Outcomes:

- * Learn encryption terminology
- * Understand symmetric and asymmetric cipher principles
- * Learn encryption standards
- * Understand how firewalls and malicious software corrupt systems
- * Learn how to recognize intruders on the network and how to prevent them from entering
- * Understand network security concepts
- * Understand public-key cryptography, hash functions, authentication codes, digital signatures, key management and user authentication protocol principles
- * Understand transport-level, wireless, electronic mail and IP security principles
- * Understand how to implement transport-level, wireless, electronic mail and IP security using encryption, firewalls, ciphers, hash functions and digital signatures

Prerequisite(s): CMSC2266.

(3 C: 2 lect/pres, 1 lab, 0 other)

CMSC 2240 - Advanced C# Programming

This course will expose the student to advanced C# components which will increase their programming expertise and value in industry. Students will build additional knowledge and skills by creating ASP.Net applications and learning how to use Generics, Delegates, Collections, events and Lambda expressions. Integrating remote database connectivity with ADO.Net into applications and program performance techniques will be reviewed and implemented.

Student Learning Outcomes:

- * Demonstrate knowledge of Visual Studios (VS) IDE
- * Develop ASP.Net Applications with C#

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

- * Build applications that use Generics, Delegates, Collections and events
- * Develop anonymous functions using Lambda expressions
- * Develop multi-threaded applications
- * Integrate synchronization into multi-threaded applications
- * Develop applications that utilize tasks and asynchronous techniques
- * Write C# applications to access and manipulate data in a database using ADO.NET
- * Develop, deploy and consume Web Services applications

Prerequisite(s): CMSC1203, CMSC2203.
(3 C: 2 lect/pres, 1 lab, 0 other)

CMSC 2266 - Java Language II

This course is a continuation of Java Language I. After a brief review of Java Language I, the students will be involved in writing Java stand-alone applications as well as Java applets to be embedded in HTML documents. Graphics will be explored further through the use of Java Swing and students will become versed in advanced Java concepts including Exception Handling, Collections, serialization, and queues and stacks. Database connectivity and file processing will be covered thoroughly. Java applications will be developed using command line as well as the Eclipse IDE techniques.

Student Learning Outcomes:

- * Develop Java programs using an IDE
- * Code inheritance, polymorphism, object aggregation, exception handling, recursion, Collections, serialization, and queues and stacks in Java programs
- * Develop Java applications that will include database connectivity
- * Develop Graphical User Interfaces in Java
- * Create and execute Java applets
- * Recognize Java frameworks

Prerequisite(s): CMSC1225.
(3 C: 2 lect/pres, 1 lab, 0 other)

CMSC 2268 - Network Programming

The growth of the Internet has prompted the need for network programming skills. Every year, B2B, B2C and individual e-commerce applications are gaining greater shares of the business market. Knowledge of the technologies that dynamically build these web sites, web protocols, the ISO model and client/server connectivity is critical. Programmers must have this knowledge to competitively program in the Internet environment.

Student Learning Outcomes:

- * Understand Internet terminology including ports, servers, clients, TCP protocol, UDP protocol, URL, DNS
- * Understand how HTML, JavaServer Pages, applets, cookies, sessions and servlets are used to dynamically create and maintain GUI interfaces and database connectivity for internet applications
- * Identify how the ISO model transport layer is used with TCP sockets, UDP sockets, ports and IP packet structures
- * Understand how multiple thread, single thread, synchronized thread servers and applications affect the web site
- * Understand how serial files, random access files, serializable files and JDBC connectivity are used to maintain persistent data for web sites
- * Understand the different mechanisms that RMI and CORBA use to implement distributed systems
- * Implement rapid development of distributed applications using JavaBeans and Enterprise JavaBeans
- * Identify how to incorporate multimedia into web sites

Prerequisite(s): CMSC2203.
(3 C: 2 lect/pres, 1 lab, 0 other)

CMSC 2279 - Systems Analysis and Design

This course provides the student with an opportunity to design and implement an application from start to finish. Various agile methodologies are studied. The student will design and build the application as part of a team using agile development and object-oriented methods. The team will design the applications database, incorporate reporting, implement remote database connectivity through web services, implement project source control, ensure iteration success through recording and executing stories and tasks and integrate testing throughout the applications development. When the system is finished, the team will deploy the application to a remote web server.

Student Learning Outcomes:

- * Analyze agile methodologies.
- * Interact with other students in a group environment.
- * Analyze and develop a practical approach to build an application.
- * Participate in fact-finding activities to determine user needs for application development.
- * Choose the appropriate language, platform and database to build the application with.
- * Produce stories and tasks to document iteration goals.
- * Participate in weekly team stand-up meetings.
- * Recognize the dynamics of team development.
- * Recognize the challenges of application development.

Prerequisite(s): CMSC2266, CMSC2203.

(3 C: 2 lect/pres, 1 lab, 0 other)

CMST 1320 - Introduction to Communication Studies

This course meets MN Transfer Curriculum Goal Area 1 - Oral Communication. This course introduces students to a variety of communication areas, including listening, interpersonal communication, small group communication and public speaking. Students will apply concepts from these areas through writing, discussion and speaking. This course emphasizes the importance of effective communication in everyday life.

Student Learning Outcomes:

- * Explain how perception and identity affect how we send and receive messages both in writing and speaking.
 - * Utilize effective communication choices that meet the needs of a multicultural audience.
 - * Study how communication functions within personal relationships, small groups, and public contexts, and apply these concepts to one's own communication.
 - * Explore how communication is affected by language and nonverbal communication choices within personal, academic and professional settings.
 - * Apply effective listening strategies individually and within groups.
 - * Participate in group communication to develop effective small-group skills.
 - * Develop communication skills and improve self-confidence when public speaking by preparing, practicing, and delivering logical speeches.
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

CMST 2300 - Introduction to Public Speaking

Meets MN Transfer Goal 1 - Oral Communication. This course helps students become familiar with, and use, a variety of techniques for effective public speaking. Topics included are topic selection and development; audience analysis; message and argument construction, critical thinking and evaluation; outlining and organization; and delivery and presentation skills.

Student Learning Outcomes:

- * Develop an understanding of public speaking as an interactive process through audience analysis and evaluation of speeches
- * Develop an understanding of the underlying components of effective speaking including research, topic development, organization, and methods of informing and persuading audiences
- * Develop skills in the delivery of speeches
- * Explore the role of speech making in our society
- * Understand some of the ethical issues related to public speaking

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score .
(3 C: 3 lect/pres, 0 lab, 0 other)

CMST 2302 - Small Group Communication

This course meets MnTC Goal Area 1 and Goal Area 9 - Oral Communication, Ethical and Civic Responsibility.. This course covers basic Small Group Communication principles and features. Students are given a variety of group projects to allow them time to experience for themselves the capacity for superior solutions through group discussion using mediated and face to face methods. Students will investigate the various technologies that are used for group planning and problem-solving. In core groups, students will try a variety of group roles, weed out successful from unsuccessful group behaviors, uncover cultural biases around teamwork, analyze power in groups, and examine the role of groups in our society. Team presentations (preparation, delivery, assessment) will be part of this course.

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Student Learning Outcomes:

- * Demonstrate communications skills necessary for effective groups
- * Apply effective communication strategies for groups involving technology and virtual environments
- * Identify types of leadership and the benefits and limits of different leadership styles
- * Research, create, present, and assess group presentations
- * Analyze ethical issues and responsibilities of groups and their members in society
- * Examine and articulate individual views of power in group settings
- * Research, discuss, and evaluate effective group decision making and problem solving
- * Evaluate groups and their purpose in our society, both as participant and observer

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

CMST 2310 - Interpersonal Communication

This course meets MnTC goal area 1 - Oral Communication. This course covers the theory and practice of interpersonal communication. Core concepts are verbal and nonverbal communication, communication styles, perception, self-identity, active listening, and conflict resolution skills.

Student Learning Outcomes:

- * Identify basic theories and concepts in the processes of Interpersonal Communication.
- * Analyze the effects of culture, gender, self, and perception when sending and receiving verbal and nonverbal interpersonal communication messages across varying channels.
- * Evaluate the implications of various communication behaviors and influence of those behaviors on self and others.
- * Demonstrate active listening.
- * Demonstrate effective communication with positive outcomes for human relationships.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

CMST 2315 - Persuasion and the Media

Meets MN Transfer Curriculum Goal Area 1 Oral Communications and Goal Area 9 Ethical and Civic Responsibility. This course will explore the logical and psychological processes of persuasion. This is accomplished through analysis of various persuasive theories and practices as they occur in a range of communication situations and across different media. Students will apply concepts from these areas through writing, discussion and speaking. This course will focus on the impact of mediated persuasion on society in order to develop an awareness of our responsibilities as consumers of persuasion.

Student Learning Outcomes:

- * Examine the nature, methods and functions of persuasion in contemporary society.
- * Evaluate persuasion in a variety of communication contexts to become better receivers of persuasive messages.
- * Understand our responsibility as citizens to be aware of the impact of persuasion on us.
- * Identify and employ strategies for analyzing and discussing persuasive messages.
- * Analyze the impact of media on cultural attitudes and values.
- * Assess how persuasive messages from the media influence a receiver's attitudes and creates behavioral change.
- * Understand the ethical and moral obligations of being a consumer of the media's persuasive messages.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score,
(3 C: 3 lect/pres, 0 lab, 0 other)

CNST 1502 - Building Materials and Methods

This course introduces the student to materials used in construction, including lumber, panel materials, engineered products, concrete, and metals. Adhesives, fasteners and fastening techniques will be studied. This course will also introduce the student to the basics of construction practices, techniques, and construction problem solving.

Student Learning Outcomes:

- * Identify various building materials and elements of a building using the correct industry terms.
 - * Describe the various components of building systems, including foundations, structural systems, thermal and moisture protection systems, finish systems, electrical and mechanical systems.
 - * Demonstrate the application of various materials.
 - * Select materials for correct use based on their compliance with applicable building codes and industry practices.
 - * Examine the manufacturing, environmental issues, social impacts, and the distribution processes of various building materials.
 - * Evaluate various methods of construction used currently and in the past.
 - * Compare various conservation strategies.
- (3 C: 3 lect/pres, 0 lab, 0 other)

CNST 1506 - Estimating for the Construction Trades I

This course will introduce the student to residential construction estimating concepts. Students will be introduced to materials and methods used in residential construction projects. Some materials to be examined include, metals, concrete, masonry, wood, engineered wood products, plastics, thermal and waterproofing products. Application of linear, square, and cubic measurements and their relationships to the estimating process will be studied. Estimating software will be introduced. The application of the various Minnesota Codes used in residential construction will be studied.

Student Learning Outcomes:

- * Develop an understanding of various building trade terminology.
- * Identify various types of construction used on specific projects.
- * Identify the principles of estimating.
- * Examine residential construction documents to determine items and quantities.
- * Explore and interpret plan specifications.
- * Organize material takeoffs for building plans.
- * Select appropriate materials for various applications.
- * Describe properties of various materials.
- * Develop an understanding of the applicable codes and how they apply to residential construction estimating.
- * Estimate costs using industry cost sources.
- * Demonstrate consistency in the estimating process.

Prerequisite(s): CNST1502.

(3 C: 2 lect/pres, 1 lab, 0 other)

CNST 2502 - Estimating for the Construction Trades II

This course will build on the knowledge and skills developed in CNST1506. Further study will include more complex structures, commercial construction documents and emerging materials of the industry. Materials costs, availability and compatibility will be analyzed.

Student Learning Outcomes:

- * Identify various types of construction used on specific projects.
- * Apply the principles of estimating.
- * Examine commercial construction documents to determine items and quantities.
- * Expand knowledge of plan specifications.
- * Organize takeoffs by CSI division.
- * Select appropriate materials for various applications.
- * Analyze properties of various materials.
- * Develop an understanding of the applicable codes in commercial construction.
- * Determine unit costs using industry cost sources.
- * Demonstrate consistency in the estimating process.

Prerequisite(s): CNST1506.

(3 C: 2 lect/pres, 1 lab, 0 other)

CNST 2506 - Construction Management

The learner will develop skills and knowledge of construction management that will assist them in understanding how projects are envisioned, designed, and built; the types of materials and methods used; methods for estimating the cost of construction; project scheduling and project management.

Student Learning Outcomes:

- * Describe the phases of a construction project.
- * Explain why it is important to plan.
- * Explain the importance of construction documents.
- * Identify various construction documents and describe their use.
- * Identify the components of an estimate.

- * Describe the estimating process.
- * Select the correct materials for a project.
- * Prepare a project estimate.
- * Compare scheduling methods.
- * Create a project schedule.
- * Describe the billing process.
- * Compute net billing calculations.
- * Explain the importance of personal presentation to customers.
- * Discuss the importance of ethical business behavior.

Prerequisite(s): CNST2502.

(3 C: 3 lect/pres, 0 lab, 0 other)

CNST 2510 - Commercial Estimating and Project Analysis

This course will introduce the students to commercial construction estimating concepts. Application of linear, square, and cubic measurements and their relationships to the estimating process will be studied. Estimating software will be introduced and used for commercial applications.

Student Learning Outcomes:

- * Identify various types of construction used on specific projects.
- * Establish material quantities for commercial construction projects.
- * Establish material quantities with emphasis on related mathematics as it applies to commercial construction.

Prerequisite(s): CNST2502.

(2 C: 0 lect/pres, 2 lab, 0 other)

CPTR 1201 - Computer Basics

This course teaches the skills and basic concepts related to personal computer use. The course will provide an introduction to various components for desktop and laptop computers (hardware), common devices attached to computers (peripherals), and current computer operating systems. Students gain experience with keyboarding, basic productivity applications, file storage and management, electronic mail, internet use, as well as learning management systems. This course is intended for students with little or no prior computer experience.

Student Learning Outcomes:

- * Identify and describe major components of desktop and laptop computer hardware
- * Customize an operating system to meet the needs of the user
- * Use current application software to produce word processed documents, simple spreadsheets, and slide show presentations
- * Demonstrate how to save files locally, on removable drives, and on a cloud system
- * Demonstrate file management by creating files and folders and placing items into these files and folders
- * Use common electronic mail systems to send, receive, retrieve, and manage electronic mail
- * Demonstrate the use of internet browsers to conduct web searches to locate news and information
- * List safe practices and internet etiquette guidelines
- * Demonstrate the use of learning management systems

(3 C: 2 lect/pres, 1 lab, 0 other)

CPTR 1210 - Introduction to Computers

Students in this course will learn and demonstrate a strong proficiency in all components of the Microsoft Office Suite (Word, Excel, Access, and PowerPoint) by creating documents, worksheets, databases, and presentations. Students will also gain hands on experience with the most recent Microsoft Windows operating system. In addition, students will gain an understanding of the components of a computer, computer terminology, the internet, networks, security, and privacy. Keyboarding proficiency is recommended for any student entering this course.

Student Learning Outcomes:

- * Demonstrate an understanding of computer hardware, software and terminology.
- * Employ proper file management skills for local, networked and removable storage devices
- * Use skills needed to work in the Windows environment.
- * Explore the internet, World Wide Web and the potential security and privacy issues associated with their usage.
- * Acquire an appreciation of the moral and social implications of computer technology.

- * Create professional documents using word processing to include use of appropriate referencing, citations, tables, building blocks, special formatting.
- * Create professional and informational slide shows using presentation software.
- * Use worksheets to process, manipulate, and display numeric data in a meaningful manner through the use of special functions, charts, and graphs.
- * Demonstrate the ability to plan and create basic databases with an emphasis on efficient data access and retrieval using database software.
- * Mobilize information by integrating content between word processing, spreadsheet, databases and presentation software.

(3 C: 2 lect/pres, 1 lab, 0 other)

CRTK 1300 - Introduction to Critical Thinking

Meets MN Transfer Goals 2 - Critical Thinking.

Intro to Critical Thinking is a practical course in critical thinking. It develops monological and multilogical and ethical reasoning skills and explores creative and logical approaches to problem solving. It examines how our thinking skills affect our personal identities, our relationships with others, and our understanding of culture. It analyzes systems of ideas, multiple perspectives on issues, and differing analytical approaches. It develops the higher order thinking skills, intellectual values, and the qualities of thought important for personal integrity, academic success, and effective citizenship.

Student Learning Outcomes:

- * Solve problems using creative thinking and logical reasoning.
 - * Distinguish between facts, assumptions, inferences and implications in beliefs and arguments.
 - * Apply effective problem solving techniques to monological and multilogical problems.
 - * Apply strategies for reducing bias and prejudice on thinking.
 - * Analyze the Elements of Thought (Purpose, Questions, Information, Inferences, Assumptions, Point of View, Concepts, and Implications) in decision making.
 - * Apply ethical reasoning to problem solving situations.
 - * Apply the Intellectual Virtues (Intellectual Humility, Empathy, Integrity, Courage, Autonomy, Perseverance and Confidence in Reason) to the evaluation of beliefs, arguments, and theories.
 - * Demonstrate the Intellectual Standards (Accuracy, Precision, Clarity, Breadth, Depth, Significance, Logic, and Fairness) in coursework.
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

CSSC 1300 - Career Exploration

This course is designed for students who are not enrolled in a program of study and are uncertain about their career choices. The course will assist students in determining educational and career direction through an examination of values, preferences, interests, and skills. In addition, students will become familiar with sources of occupational information. Decision-making and goal setting skills are utilized in the development of an educational and career plan.

Student Learning Outcomes:

- * Assess their skills, values and interests
- * Integrate self-knowledge into career decision-making process
- * Relate their needs and characteristics to the employment market
- * Gain understanding of employment characteristics and employment trends through utilization of a variety of research activities
- * Identify future educational objectives
- * Develop a career action plan

Prerequisite(s): READ0300 or Appropriate Placement Score.

(1 C: 1 lect/pres, 0 lab, 0 other)

CSSC 1302 - Career Development/Job Search

This course is intended for students in their last two semesters before graduation. The focus of this course is to assist students with the skills needed to find and obtain career related employment, to become familiar with methods of developing career development opportunities essential for life-long learning, and to become aware of critical attitudes needed in job keeping and career advancement. Students not within 2 semesters of graduation need instructor approval.

Student Learning Outcomes:

- * Develop a career portfolio
- * Demonstrate ability to use software, internet and other sources for career and education exploration and development

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- * Develop career documents including resumes, cover letters, and thank you letters
 - * Demonstrate interviewing skills
 - * Demonstrate skills in job seeking, including exploring the hidden job market, including telephone usage
 - * Identify job keeping skills
- (1 C: 1 lect/pres, 0 lab, 0 other)

CULN 1202 - Introduction to Culinary Arts

This course includes an introduction to the Food Service Industry, culinary terms, safety, and sanitation, history, use of weights and measures. This course also covers basic cooking techniques and knife identification and use.

Student Learning Outcomes:

- * Provide an explanation of program expectations
- * Define industry segments
- * Identify employment opportunities
- * Identify industry equipment
- * Give an explanation of proper knife usage and care
- * Knowledge of proper safety and sanitation

Prerequisite(s): MATH0380 or MATH0400

(3 C: 2 lect/pres, 1 lab, 0 other)

CULN 1205 - Kitchen Operations

This course teaches the skills students will need to know about the food service industry. This course will cover counter service operation, kitchen math, ware-washing procedures, equipment identification and equipment usage.

Student Learning Outcomes:

- * Utilize and apply kitchen terminology
- * Efficiently perform dish room procedures.
- * Demonstrate and performance of kitchen math
- * Calculate food expenses including profit and loss statements.
- * Demonstrate knowledge of recipe utilization.
- * Design, plane and sequence menus.
- * Efficiently perform preparation procedures (Misen Place).

(3 C: 2 lect/pres, 1 lab, 0 other)

CULN 1210 - Servsafe Certification

This course provides a working knowledge of safe food handling, personal hygiene, food-borne illnesses, HACCP procedures. This course is designed to prepare students for the State of MN food management certificate examination.

Student Learning Outcomes:

- * Identify and understand food-borne illnesses.
- * Understand proper sanitation techniques.
- * Practice good personal hygiene methods.
- * Successfully pass state food safety tests.

(1 C: 1 lect/pres, 0 lab, 0 other)

CULN 1215 - Stocks, Soups, Sauces

The production of a properly seasoned stock is a foundational principle within all of food production. This course covers the key concepts of stock production and from these stocks; various sauces and soups can be prepared utilizing various cooking principles. This course covers the identification and production of classical stocks as well as the utilization of convenience bases for stock production. Additional key topics covered in this course include herb, spice and flavoring use/identification, proper use of thickening agents, stock and sauce ingredients, selection and utilization of proper equipment, and preparation and production of various types of soups.

Student Learning Outcomes:

- * Prepare various stocks and sauce ingredients and apply to stock and sauce production.
- * Demonstrate selection and utilization of proper equipment for stock, sauce, and soup production.
- * Prepare from scratch various stocks including, chicken, beef, vegetable, and other stocks.
- * Identify and evaluate various convenience bases and utilize this knowledge to develop stocks, sauces and soups.
- * Identify by sight, taste, and/or flavor profile up to 100 herbs, spices, flavorings, and oils.

- * Evaluate flavor profiles within stocks, sauces and soups and demonstrate proper adjustment techniques.
 - * Identify and prepare various types of sauces including leading sauces and small sauces.
 - * Demonstrate preparation and use of various thickening agents (i.e., roux and slurry) in the production of various sauces and soups.
- (3 C: 1 lect/pres, 2 lab, 0 other)

CULN 1220 - Introduction to Pantry Food Preparation

This course covers proper techniques, procedures and responsibilities in the preparation of various pantry foods/dishes including salads, salad dressings and sandwiches. An emphasis on the proper storage and handling of various ingredients is addressed. Hands-on work will be an integral part of this course as students apply knowledge of various aspects of pantry foods.

Student Learning Outcomes:

- * Demonstrate a knowledge of pantry food preparation including the safety and storage of various ingredients and sanitization methods for various pantry food items.
- * Identify by sight and flavor profiles various salad ingredients and types.
- * Identify and evaluate various types of oils and vinegars and apply knowledge to the creation of various salad dressings.
- * Identify and prepare various types of breads, spreads, and fillings for sandwich production.
- * Demonstrate the proper production of both hot and cold sandwiches.
- * Evaluate and critique various pantry items for quality and usage.

Prerequisite(s): CULN1201

(2 C: 1 lect/pres, 1 lab, 0 other)

CULN 1230 - Vegetables, Potato, Rice and Farinaceous Products

This course covers identification and preparation of vegetables, potatoes, rice and farinaceous products.

Student Learning Outcomes:

- * Determine sanitation techniques
- * Understand storage procedures for vegetables
- * Develop an understanding of starch products (rice's, pasta, potatoes, grains)
- * Demonstrate cooking methods
- * Identify different vegetable types: red, yellow, green, white, etc.

Prerequisite(s): CULN1201

(2 C: 1 lect/pres, 1 lab, 0 other)

CULN 1235 - Introduction to Breakfast

This course covers keys components of breakfast production including the preparation of various egg dishes, meats, cereals, starch products, breakfast pastries, fruits, and beverages. Teamwork, professionalism and efficiency in service are stressed in this course. Students will practice these concepts concurrently while gaining knowledge of the various cooking methods and techniques. A capstone project to this course will include preparing 2 over-easy eggs and an omelet within 2 minutes.

Student Learning Outcomes:

- * Identify various types of breakfast food products and demonstrate proper food safety and sanitization techniques.
- * Learn and apply proper terminology for breakfast items for efficiency in breakfast production.
- * Demonstrate proper techniques in the preparation of eggs including over-easy, poached, scrambled, hard-boiled, and various types of omelets.
- * Identify and prepare various types of meats and potato products for breakfast service.
- * Perform and serve breakfast beverage preparation.
- * Identify, prepare, and properly serve multiple types of pastries.
- * Demonstrate professionalism and teamwork in the production of breakfast items and develop a sense of urgency in the production of breakfast items.
- * Properly prepare 2 over-easy eggs and an omelet within 2 minutes.

(2 C: 1 lect/pres, 1 lab, 0 other)

CULN 1245 - Basic Baking

This course covers keys components of bakeshop production and will provide an understanding of terminology, methods, and functions of multiple baking ingredients. A wide range of topics will be covered in this course including the use of yeast products, the development of yeast breads and quick breads, cake

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production and icings, cookies, various pies and pastries, and the production of creams, custards, puddings and desserts.

Student Learning Outcomes:

- * Identify and utilize standard baking terminology and ingredients in a variety of productions.
 - * Demonstrate the proper use of scales and other weights and measurements.
 - * Demonstrate various mixing methods within the bakeshop such as straight dough method, angel food method, sponge method, and creaming method.
 - * Prepare a variety of cakes, cookies, pies, pastries and dough products utilizing skills and production techniques demonstrated in class.
 - * Learn and utilize baker's percentages to convert bakeshop recipes for production.
 - * Participate in a variety of experiences that develop professional skills, attitudes and behaviors.
 - * Demonstrate proper safety and sanitization methods for all bakeshop work.
- Prerequisite(s): CULN1201
(3 C: 1 lect/pres, 2 lab, 0 other)

CULN 1250 - Basic Cooking Principles

This course builds upon the skills and knowledge developed in the preparation of stocks, sauces and soups and applies the knowledge to larger food industry principles. Key topics included in this course include identification of various meat products, fabrication of meats, poultry, wild game, various seafood items, processing and curing of meats, and the application of complimentary sauces for meat, poultry, and seafood dishes. Additional topical areas in this course include food cost and pricing, "center of the plate" costs, yield testing for the fabrication of meats, application of cooking methods for various meat, poultry, and seafood dishes, and an introduction to food presentation and garnishing.

Student Learning Outcomes:

- * Identify by sight over 25 meat cuts.
- * Fabricate a primal cut of beef and perform a raw yield test. Apply raw yield test results to food costs and menu pricing.
- * Demonstrate proper fabrication of poultry and various wild game products and prepare fabrications for meal service.
- * Demonstrate cleaning and preparation of various seafood items including fish, clams, mussels, squid, octopus, and others.
- * Prepare accompaniments and sauces to various meat, poultry, and seafood dishes.
- * Develop, assess, and evaluate various dishes on presentation and garnishing to determine final product for customers.
- * Apply proper cooking principles to a multitude of dishes.
- * Learn industry terminology and apply to multiple aspects of food production.
- * Apply proper safety, sanitization, and storage procedures for all meat, poultry and seafood items.

Prerequisite(s): CULN1240

(4 C: 0 lect/pres, 4 lab, 0 other)

CULN 1265 - Basic Food Production Principles

This course covers keys components of food production including menu planning, time management for food production, delegation and direction within kitchen teams, and food presentation. Teamwork and professionalism are stressed in this course. Students in this course will practice these concepts concurrently while gaining knowledge of various cooking methods and techniques including broiling and grilling, roasting and baking, and sautéing. A capstone project to this course will include preparing a 3-course dinner for 4 people to whom the student will demonstrate and apply various cooking methods and procedures.

Student Learning Outcomes:

- * Identify and apply proper food production terminology to various projects.
- * Prepare various dishes (meat, poultry, seafood, vegetables, fruits, pastas, etc.) utilizing multiple cooking techniques including broiling and grilling, roasting and baking, and sautéing.
- * Develop and apply various concepts related to kitchen leadership including sense of urgency, time management, preparation/planning, management, and direction and delegation.
- * Apply and practice food production principles for convenience foods and ingredients.
- * Develop and apply knowledge of garde manger techniques including concepts of food presentation, plate layout and design, and applying height to plates.
- * Demonstrate proper safety and sanitization techniques to all aspects of food

production and service.

- * Prepare and serve a 3-course meal (soup/salad, main entree with accompaniments, and dessert) to an evaluating team.

Prerequisite(s): CULN1245, CULN1250

(3 C: 1 lect/pres, 2 lab, 0 other)

CULN 1270 - Garde Manger

Developing visual appeal to food is an essential skill for all professional cooks. This course teaches students the fundamentals of garde manger work. Students will learn multiple selection and preparation skills to make food more visually appealing. Specific work with aspic sheets, chaud froid, fruit, vegetable, and tallow carvings as well as centerpiece displays will be emphasized.

Student Learning Outcomes:

- * Identify tools, equipment and techniques used in garde manger work.
- * Learn the definitions and terminology used in garde manger and apply the knowledge to various classroom projects.
- * Identify products used in garde manger work.
- * Prepare and display a variety of centerpieces and garnishes for dishes developed in class.
- * Participate in a variety of experiences that will develop student professional skills, attitudes and behaviors.

Prerequisite(s): CULN1250

(4 C: 1 lect/pres, 3 lab, 0 other)

CULN 1275 - Social Etiquette

Social etiquette behaviors within a society or group vary greatly across cultures. This course is an overview of current etiquette standards in today's work environment with special attention given to the Food Service industry. Key components of this course include social/dining etiquette, professional behaviors and standards, and an exploration of different cultural norms and expectations for social etiquette.

Student Learning Outcomes:

- * Learn the key elements of professional and social etiquette for formal dining.
 - * Learn specific professional behaviors for use in a variety of global industry settings.
 - * Describe, practice, and demonstrate social dining etiquette for a formal 8-course gourmet dinner.
 - * Research and present on social etiquette from different countries throughout the world.
 - * Demonstrate proper place settings for a multiple-course gourmet dinner and describe proper use of various utensils and dishware.
 - * Develop communication strategies and techniques that demonstrate professional behaviors and standards.
- (2 C: 0 lect/pres, 2 lab, 0 other)

CULN 1280 - Foodservice Internship

This course involves a three-week (96 hour) internship at local restaurant operations. This course will provide the student an opportunity to sharpen their culinary skills in a fast-paced, real-world environment. The student will, under the direction of experienced chefs/cooks, experience teamwork, problem solving, and a feel for the Food Service industry.

Student Learning Outcomes:

- * Set up and assist with the coordination of internship expectations, hours/scheduling, goals, paperwork, and duties to be assigned.
 - * Develop teamwork skills through communication and daily work with kitchen and restaurant staff.
 - * Demonstrate problem solving abilities by applying in-class experiences and knowledge to the real-world environment.
 - * Demonstrate an understanding of the different menu items and cooking procedures while balancing classroom knowledge with processes/procedures expected at the internship location.
 - * Experience a full-service restaurant in operation.
 - * Demonstrate professional behaviors and standards and maintain communication with internship coordinator(s) and instructors.
 - * Serve as a positive reflection of both St. Cloud Technical and Community College and the Culinary Arts program.
- (2 C: 0 lect/pres, 0 lab, 2 other)

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DEHY 1400 - Dental Hygiene Seminar I

This course introduces the first year dental hygiene student to the profession of dental hygiene. Students gain knowledge and understanding of patient assessments, medical histories, dental histories, medical emergencies and infection control protocol in the dental setting. Students will learn charting, documentation, and components of the dental record. Identification of soft and hard deposits, use dental indices and stain removal techniques are introduced. The topics of patient communication, health literacy, and cultural competence are addressed.

Student Learning Outcomes:

- * Explain the history of the dental hygiene profession and the role of the dental hygienist.
- * Relate the significance of personal, medical, and dental histories to providing safe, preventive, and comprehensive dental care to patients.
- * Identify medical and dental risk factors that may lead to a medical emergency in the dental office and explain protocols for managing medical emergencies.
- * Apply strategies for effective health communication and discuss how health literacy facilitates culturally competent patient care.
- * Explain concepts related to ensuring confidentiality and privacy of patient information as related to the Health Insurance Portability and Accountability Act (HIPAA).
- * Identify transmissible diseases, assess risk of transmissible diseases, and explain use of personal protective equipment, standard precautions and strict infection control protocols.
- * Demonstrate an understanding of accurate charting of patient dental records to ensure planning and implementation of dental procedures.

Corequisite(s): DEHY1480, DEHY1424

(2 C: 1 lect/pres, 1 lab, 0 other)

DEHY 1402 - Dental Hygiene Seminar II

This course will expand the dental hygiene student's knowledge level in planning for dental hygiene patient care. Emphasis will be placed on dental health education, primary prevention measures, tobacco cessation education, xerostomia education, oral hygiene instruction, aids and adjuncts. Students will learn how to address the oral hygiene needs of patients who have fixed appliances, dentures and orthodontic appliances. Students will gain a greater understanding of patients with diabetes mellitus, patients undergoing cancer therapy, developmental disabilities and impairments, and physical disabilities and impairments. Students will learn how to perform safe patient transfers (including gait belts) when working with patients who use wheelchairs, walkers, and other assistive devices.

Student Learning Outcomes:

- * Implement scientific evidence as the basis for dental hygiene education and preventive care.
- * Assess, plan, and implement dental hygiene care in areas oral hygiene education, xerostomia education and tobacco cessation education.
- * Recognize the oral manifestations and health hazards associated with tobacco use.
- * Describe common oral complications secondary to cancer treatment.
- * Assess and evaluate the needs of patients with fixed dental appliances, dentures and orthodontic appliances.
- * Describe and demonstrate use of oral infection control devices, toothbrushes, dental floss and interdental cleaners.
- * Incorporate evidence based decision making for dental hygiene care as it relates to patients with diabetes mellitus, developmental disabilities and impairments, physical disabilities and impairments, and patients undergoing cancer therapy.
- * Explain procedures and factors that contribute to safe and successful management of individuals with disabilities during dental hygiene care.
- * Demonstrate safe patient transfers using gait belts and transfer devices.

Corequisite(s): DEHY1482, DEHY1484

Prerequisite(s): DEHY1400, DEHY1480.

(2 C: 2 lect/pres, 0 lab, 0 other)

DEHY 1404 - Clinical Seminar III

This course is a continuation of Clinical Seminar II (DEHY 1402) with emphasis on advanced dental hygiene skills, client relations and special needs. The course includes didactic study of treatment planning, oral health care adjuncts, root planning techniques, powered scaling, sealants, dental materials, implant care and care for the client who is medically compromised.

Student Learning Outcomes:

- * Understand the scientific basis for dental hygiene technology and methodol-

ogy and transfer this knowledge first to the laboratory setting and then clinical practice

- * Prepare and present a scientific paper on a material or method that a dental hygienist may choose to use on a client in a clinical setting
- * Interpret and utilize the process of dental hygiene diagnosis, care planning, therapy and maintenance and how they all fit into the total treatment plan
- * Formulate a treatment plan using SOAP documentation and the APIE format
- * Determine, by causing evaluative criteria, the acceptability of a placed sealant
- * Relate components of alginate impressions to amount and function
- * Discuss the role of the dental hygienist in restorative therapy
- * Describe how the new paradigm of periodontal debridement affects current use of sonics/ultrasonics
- * Interpret rationale, treatment of the implant patient and present motivational strategies for home care of the client with dental implants
- * Recognize indications/contraindications for chemotherapeutics, and antibiotic therapy in the treatment of periodontal disease
- * Determine effective agents for reduction of dentinal hypersensitivity
- * State what is reasonable and prudent with regard to documentation of the dental record
- * Identify criteria used for informed consent
- * Recognize client special needs in areas of cardiovascular disease, stroke, pulmonary conditions and chemical dependency and relate these to the formulation of a treatment plan

Corequisite(s): DEHY1420, DEHY1486

Prerequisite(s): DEHY1402, DEHY1484.

(2 C: 1 lect/pres, 1 lab, 0 other)

DEHY 1406 - Clinical Seminar IV

This course is a continuation of DEHY 1404, with a continued focus on care of the client with special needs, and continued emphasis on dental hygiene research, leadership, management, ethics and jurisprudence in dentistry, and the role of the dental hygienist in alternative care settings. This course is to be taken concurrently with DEHY 1488.

Student Learning Outcomes:

- * Assess management and recognize alteration in dental hygiene care planning for clients with special needs. This includes older adults, women and children, medically compromised and both mental and physical disabilities.
- * Recognize criteria for reporting child abuse.
- * Recommend parameters for the dental hygiene practitioner in selection of new products for clients.
- * Write a scientific paper recommending a new product for the client.
- * Complete the Minnesota Jurisprudence exam.
- * Design an appropriate resume and cover letter for the dental hygienist.
- * Critique current trends in dentistry as evidenced by scientific articles.
- * Develop an awareness of ethical dilemmas encountered in the practice of dental hygiene.
- * Identify legal issues relevant to the various roles of the dental hygienist.
- * Recognize cultural diversity in the delivery of the dental hygiene health care plan.

Corequisite(s): DEHY1488

Prerequisite(s): DEHY1404, DEHY1486.

(2 C: 2 lect/pres, 0 lab, 0 other)

DEHY 1410 - Introduction to Dental Materials and Methods

This lecture/lab course is designed to provide the dental hygiene student with information required to facilitate the optimal selection, handling, placement and care of the materials used in dentistry. Topics covered include cements, varnishes, liners, esthetic anterior restorations, posterior restorations, sealants, impression materials, dental stone and plaster, polymers for prosthetics, and provisional restorations. Students will work with dental materials and typodonts in the laboratory setting.

Student Learning Outcomes:

- * Recognize the agencies that regulate the manufacturing of dental materials.
- * Differentiate the physical properties and biological characteristics of dental materials as they relate to the oral environment of the mouth.
- * List the properties and characteristics of an ideal dental material.
- * Differentiate between direct and indirect restorative materials.
- * Explain the uses of dental cements, varnishes, liners and bonding agents in restorative dentistry.

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- * Explain the types of dental materials used to fabricate mouthguards, retainers, bleaching trays, dentures and resin based prosthetics.
 - * Explain the types of dental materials used to fabricate crowns, inlays, onlays, dental bridges, composite restorations, amalgam restorations, porcelain restorations, and dental veneers.
 - * Explain and demonstrate the steps in taking an alginate impression.
 - * Identify the uses and limitations of dental stone and dental plaster in making dental study models.
 - * Demonstrate pouring and trimming of dental study models.
- (2 C: 1 lect/pres, 1 lab, 0 other)

DEHY 1414 - Nutrition and Dental Hygiene

This course is an introduction to the basic principles of nutrition and the relationship to dental hygiene. Course content includes: the role of nutrients in the maintenance of normal health, the effects of nutrition on disease, nutrition in the human life cycle, food behaviors and diet. The course will analyze the links between oral health and diet and how to assess the nutritional status of dental patients. Students will learn about sugars, acids, caries cycle, the prevention of tooth decay, and the benefits of fluorides to prevent tooth decay. Students will complete a self-analysis of their own diets and learn how to develop a nutritional care plan for dental patients.

Student Learning Outcomes:

- * Explain the therapeutic value of foods in the normal diet.
- * Apply basic nutrition principles through the lifespan and with ethnic groups to recognize food choices that may be different.
- * Explain the role of sugar in cause of tooth decay.
- * Identify nutritional factors in tooth development and maintenance.
- * Discuss the implications of specific foods and nutrients on oral health and systemic health.
- * Complete a nutritional self-assessment of diet and eating habits.
- * Analyze a food diary of a dental patient.
- * Develop a care plan for a patient with a high sugar diet and potential for tooth decay.
- * Compare and contrast the use topical versus systemic fluoride in preventing tooth decay.

(2 C: 2 lect/pres, 0 lab, 0 other)

DEHY 1418 - Introduction to Radiology

This lecture/laboratory course provides dental hygiene students with the knowledge of radiographic principles and exposure techniques in both traditional and digital radiography. Course content includes theoretical concepts of radiation, effects of radiation exposure, radiation production, radiation safety and monitoring, infection control, x-ray film, processing and mounting, operation of x-ray unit, intraoral and extraoral radiographic techniques, anatomical landmarks, and processing errors. The laboratory portion of the course will prepare the student to demonstrate competency in exposing radiographs using the bisecting and paralleling techniques for both traditional and digital radiology. Students will practice taking radiographs on phantom skulls and DXTRR.

(Human-like mannequins)

Student Learning Outcomes:

- * Identify the concepts, effects, production and monitoring of radiation according to OSHA (Occupational Safety and Health Administration) guidelines for both traditional and digital radiology.
- * Compare the processing, mounting and critiquing of dental radiographs for traditional versus digital radiographic surveys.
- * Describe and implement necessary infection control guidelines for preparation, during and after x-ray exposure for the operator, the patient and the equipment.
- * Recognize the difference between the paralleling and bisecting technique for both traditional and digital radiation.
- * Demonstrate the exposure and processing of both digital and traditional radiographs according to the SCTCC Radiology Criteria manual.
- * Identify images of anatomical structures and images recorded on all dental radiograph.

(2 C: 1 lect/pres, 1 lab, 0 other)

DEHY 1421 - Dental Hygiene Materials and Methods

This course is a continuation of DEHY 1410 where students gain lab experience and competency with dental hygiene expanded functions. Lab procedures will

include alginate impressions, study models, custom bleaching trays, power scaling devices, amalgam polishing, isolation techniques, irrigation, and use of dental technology.

Student Learning Outcomes:

- * Assess dental clients and determine need for dental hygiene procedures.
- * Explain level of supervision for each procedure based on the Minnesota Board of Dentistry guidelines.
- * List risks and benefits of treatment as they relate to patients dental needs.
- * Demonstrate dental hygiene procedures on typodonts and classmates.
- * Demonstrate documentation of procedures in patient dental chart.

Prerequisite(s): DEHY1484, DEHY1402, DEHY1410.

(1 C: 0 lect/pres, 1 lab, 0 other)

DEHY 1422 - Dental Pharmacology

This course covers a survey of drug groups with special emphasis on the drugs used in dentistry. This course will include content in the following: physical, and chemical properties of drugs, modes of administration, therapeutic and adverse effects, and drug interactions. Identifying and managing clinical emergencies is also included.

Student Learning Outcomes:

- * Explain the scientific basis and rationale for drug use
- * Explain the process of pharmacokinetics
- * Describe pharmacological actions and effects on drugs
- * Explain the role of the CNS, PANS, and SANS in drug use
- * Utilize drug references in assessing patient medical histories and medications

(2 C: 2 lect/pres, 0 lab, 0 other)

DEHY 1424 - Head, Neck and Dental Anatomy

This course covers the anatomical components and functions of head, neck, teeth, and supporting structures. Emphasis will be on the skeletal, muscular, nervous, venous and masticatory systems. The course includes comparative study of the deciduous and permanent teeth.

Student Learning Outcomes:

- * Describe development, form and function of primary and permanent dentitions.
- * Identify primary and permanent dentitions using the Universal, International, and Palmer notation systems.
- * Identify and classify teeth according to class, arch, type and function.
- * List the calcification dates and eruption patterns of primary teeth and permanent teeth.
- * Identify the parts of a tooth and the landmarks of the crowns and roots.
- * Classify occlusion and bite according to the Angle's classification system.
- * Identify the TMJ (temporal-mandibular joint) and describe various TMJ disorders.
- * Describe and explain the four types of tooth tissues, their locations and functional qualities.
- * Identify the various glandular tissues found in the head, face and neck.
- * Identify the major and minor salivary glands of the mouth.
- * Locate and identify bones and muscles of the head and neck utilizing diagrams, skulls and models.
- * Describe and locate the bony landmarks of the maxilla and mandible as they relate to local anesthetic injection sites.
- * Differentiate the various blood vessels to and from the head, neck, and oral structures.
- * Identify the major nerve branches of the head, neck, face, and teeth and describe what structures they innervate.
- * Describe the origin, insertion, and action of the muscles of mastication and muscles of facial expression.
- * Locate and identify the major lymph nodes of the head, neck, face and teeth.
- * Describe the drainage patterns of lymph tissues from the face and oral structures.

(3 C: 3 lect/pres, 0 lab, 0 other)

DEHY 1428 - General and Oral Pathology

This course covers concepts of development and growth disturbances; diseases of microbiological origin; injury and repair; metabolic and disease disturbances; and oral manifestations of various diseases and conditions. Special emphasis is placed on clinical and slide recognition of pathology in the oral cavity.

Student Learning Outcomes:

- * Recognize and describe the theoretical basis of inflammation, immunity and

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deviations from normal health as it relates to the general disease process.

- * Identify, describe and differentiate pathology in the oral cavity and on radiographs applying differential diagnosis theory to dental patient case studies.
 - * Identify common etiologies of neoplasms differentiating between benign and malignant oral neoplasms and classify odontogenic cysts and tumors.
 - * Explain how metabolic changes affect the oral cavity in relationship to oral manifestations of systemic diseases and nutritional disturbances.
 - * Differentiate between healthy periodontium and diseased periodontium according to the Guidelines from the American Academy of Periodontology.
- (3 C: 3 lect/pres, 0 lab, 0 other)

DEHY 1440 - Community Dental Health I

This course introduces students to the disciplines and basic principles of dental public health, epidemiologic methods, and biostatistical measurements and analysis. The course will include identification of current issues in community dental health and review current community health practices. Emphasis will be placed on comparing and contrasting community health practices with those in private clinical settings. Students will be introduced to current literature in the field of community dental health through evaluation and critiquing of journal articles.

Student Learning Outcomes:

- * Introduce the theories of dental community health as a background for lifelong participation in planning and implementation of community projects
- * Compare and contrast the histories of public health dentistry and public health medicine
- * Explain dental needs as related to age, sex, race, income and geographic regions
- * Explain periodontal indices and compare subjective, objective and quantitative measures
- * Describe the chronology of fluoride research and its identification to public health
- * Explain the value of statistics in research studies
- * Describe the important variables to be considered in choosing a sample
- * Explain examiner bias and how it relates to research and experimental studies
- * Define the three measures of central tendency
- * Evaluate statistical research from professional journals and publications
- * Describe the assessment, planning and implementation process for dental health programs

(2 C: 2 lect/pres, 0 lab, 0 other)

DEHY 1445 - Community Dental Health II

This lab course is designed to provide the dental hygiene student with field experience in assessment, planning, implementation and evaluation of community dental health presentations. Practical application of dental public health methods is included.

Student Learning Outcomes:

- * Demonstrate theory and practice in instructional methods by presenting field experiences.
- * Integrate the dental hygiene program at St. Cloud Technical and Community College with other health outreach programs in the community through field trips and presentations.
- * Plan, develop, implement and evaluate a children's dental health presentation.
- * Create a portfolio consisting of community dental health based data and information regarding alternative dental hygiene careers.
- * Research and develop a professional Table Clinic to be presented in collaboration with a classmate at various community venues.
- * Create a pamphlet for consumer use to be incorporated into the presentation of a Table Clinic.

Prerequisite(s): DEHY1440.

(1 C: 0 lect/pres, 1 lab, 0 other)

DEHY 1448 - Dental Hygiene Radiology II

This lecture/laboratory course is a continuation of DEHY 1418. The course will continue to cover: the paralleling and the bisecting technique, processing and mounting, anatomical landmarks, intraoral and extraoral radiographic techniques, and exposing and processing errors. The laboratory aspect of this course prepares the student to demonstrate competence in exposing radiographs using the bisecting and paralleling techniques on human experiences using both traditional and digital radiology. This course also covers the interpretation of dental radiographs for the dental hygienist. The emphasis is on recognition of anatomic conditions, caries, periodontal disease, abnormalities, dental materials, foreign objects and

periapical lesions. All dental hygiene students must complete this course prior to graduation.

Student Learning Outcomes:

- * Integrate didactic and clinical skills in exposing, developing and evaluating radiographic films using both traditional and digital techniques.
- * Incorporate radiographs into the assessment process for effective dental hygiene care planning and client education.
- * Implement supplemental techniques and patient management skills for clients that present with special needs.
- * Contrast and compare normal radiographic landmarks, artifacts and shadows to those conditions that present as a result of the disease process.
- * Demonstrate Digital Panoramic Exposure Technique on both Dexters and humans.

Prerequisite(s): DEHY1418.

(2 C: 1 lect/pres, 1 lab, 0 other)

DEHY 1460 - Periodontics I

This course will focus on the pathogenesis, diagnosis, and treatment of periodontal disease. Emphasis will be on the progression of periodontal disease, diagnostic methods, treatment modalities, and the role of the dental hygienist in the prevention and treatment of periodontal disease.

Student Learning Outcomes:

- * Describe the pathogenesis of periodontal diseases in relationship to host response.
- * Define local and systemic risk factors for periodontal diseases as they relate to severity of periodontal destruction.
- * Explain the American Academy of Periodontology (AAP) periodontal disease classifications based on periodontal assessments of clinic patients.
- * Discuss principles of nonsurgical periodontal therapy and treatment planning when formulating patient care plans.

Prerequisite(s): DEHY1428.

(2 C: 2 lect/pres, 0 lab, 0 other)

DEHY 1464 - Periodontics II

This course is a continuation of DEHY1460 with the incorporation of advanced instrumentation and additional treatment options for patients with periodontal disease. Students will learn indications and contraindications for periodontal surgical procedures, including current technology used in the treatment of periodontal disease. This course will identify and explain the CDT (Current Dental Terminology) insurance codes used in dental hygiene care treatment and services.

Student Learning Outcomes:

- * Identify indications for periodontal surgery and explain the contraindications for periodontal surgical procedures.
- * Describe periodontal surgical procedures and discuss the role of the dental hygienist in the management of patients following periodontal surgery.
- * Demonstrate placement of periodontal dressings and removal of periodontal sutures on a typodont model.
- * Prepare a periodontal treatment plan with ADA (American Dental Association) CDT (Current Dental Terminology) dental insurance codes.

Prerequisite(s): DEHY1460.

(1 C: 1 lect/pres, 0 lab, 0 other)

DEHY 1468 - Pain Management

This course covers pain management techniques used in dentistry. The course will focus on preparing the dental hygiene student for the safe, effective administration of local anesthesia and nitrous oxide/oxygen inhalation for dental hygiene practice. Included in this course are content areas in anatomy, physiology, pharmacology and emergency procedures as they relate to local anesthesia and nitrous oxide. In the clinical sessions, students will be administering local anesthesia and nitrous oxide/oxygen to fellow students.

Student Learning Outcomes:

- * Recognize the scientific basis and/or rationale for local anesthesia and nitrous oxide/oxygen inhalation analgesia for pain management in dentistry.
- * Administer local anesthetic agent, competently, safely and effectively, to control pain with a minimum of patient discomfort.
- * Administer nitrous oxide/oxygen, competently, safely, and effectively, to manage associated complications.

Prerequisite(s): DEHY1424, DEHY1422.

(2 C: 1 lect/pres, 1 lab, 0 other)

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DEHY 1480 - Pre-Clinical Dental Hygiene I

This dental hygiene lab course is an introduction to the dental clinic setting. Students will learn principles of infection control, dental unit operation, ergonomics, dental hygiene instrument design and usage. Students will learn how to assess hard tissues and soft tissues of the head, neck and mouth. Students will be introduced to electronic patient records and data gathering. This course provides the dental hygiene student with skills and knowledge to provide prophylactic dental hygiene services to patients.

Student Learning Outcomes:

- * Demonstrate infection control protocol, hand washing and use of personal protective equipment.
- * Demonstrate operation and usage of the dental chair and dental unit parts. Differentiate plaque and calculus deposits on the teeth.
- * Demonstrate and explain usage of dental hygiene assessment instruments.
- * Demonstrate and explain usage of calculus removal instruments. Assess and document occlusion class and bite characteristics.
- * Perform and document hard tissue assessment of the mouth and teeth.
- * Perform oral cancer screenings and document all findings of soft tissue assessments.
- * Explain the protocol for managing a medical emergency in the dental clinic setting.
- * Document assessment data using electronic dental record software (3 C: 0 lect/pres, 3 lab, 0 other)

DEHY 1485 - Clinical Dental Hygiene II

This clinical course introduces the first year dental hygiene student to providing direct patient care in the dental clinic. Students are supervised in the dental clinical setting while performing patient assessments, charting, preventive dental hygiene services, scaling, mechanical polishing and therapeutic services. Students gain experience in reviewing medical histories, taking vital signs, using dental imaging, and interacting chair side with the dentist.

Student Learning Outcomes:

- * Demonstrate professional and ethical behavior when treating dental patients.
 - * Apply HIPAA rules and regulations when dealing with patient data.
 - * Perform patients assessments based on medical history, dental history and vital signs.
 - * Classify patients using the ASA (American Society of Anesthesiologists) medical classifications.
 - * Classify dental patients according to American Academy of Periodontology (AAP) guidelines.
 - * Differentiate plaque and calculus deposits on teeth.
 - * Demonstrate removal of dental deposits with hand instruments and mechanical equipment.
 - * Utilize dental imaging on dental patients.
 - * Utilize electronic dental record system to document patient services and patient chart data.
 - * Provide clinical dental hygiene services to pediatric, adolescent, adult and geriatric aged patients.
 - * Demonstrate critical thinking skills when planning and delivering dental treatment to patients.
 - * Demonstrate verbal and non-verbal communication skills with patients, staff, dentists and peers.
 - * Integrate time management protocols and procedure sequencing during patient care.
- Prerequisite(s): DEHY1480. (4 C: 0 lect/pres, 4 lab, 0 other)

DEHY 1486 - Clinical Dental Hygiene III

This course is a continuation of Clinical DH II with supervised clinical experiences which include introduction to periodontal therapy, ultrasonic instrumentation, treatment planning, and sealant placement. Radiographic interpretation is incorporated within the radiographic portion of this clinical experience.

Student Learning Outcomes:

- * Incorporate dental hygiene methodology and technology from laboratory competency to clinical competency.
- * Demonstrate clinical competency in areas of client communication, assessment, care planning, implementation of care and evaluation of success.
- * Interpret medical history for assessment of indications/contraindications for dental hygiene procedures.
- * Interpret the relationships between oral health and general health and the inter-

relationships between medical and dental care.

- * Demonstrate intermediate clinical competency in areas of time management, treatment planning, instrumentation, tissue management, radiography and client counseling.
 - * Demonstrate sharpening of instruments and maintain sharpness throughout all procedures for scaling and root planing.
 - * Summarize and record all assessments, observations and procedures using Subjective, Objective, Assessment, and Plan (SOAP) format.
- Prerequisite(s): DEHY1482, DEHY1402, DEHY1484, DEHY1485.
(6 C: 0 lect/pres, 6 lab, 0 other)

DEHY 1488 - Clinical Dental Hygiene IV

This course is a continuation of Clinical DH III with supervised clinical experiences which include advanced periodontal therapy, advanced ultrasonic instrumentation, chemotherapeutics and completion of procedural requirements. Clinical application of pain management techniques and radiographic interpretation are included during this clinical course. Students gain experience removing marginal overhangs and placing nonsurgical retraction material for gingival displacement.

Student Learning Outcomes:

- * Demonstrate clinical competency in areas of client assessment, care planning, implementation of care and evaluation of dental hygiene treatment.
 - * Demonstrate workplace readiness through clinical competency in areas of time management, instrumentation, nonsurgical periodontal therapy, client counseling and digital radiography.
 - * Correlate the relationships between oral health and general health and the inter-relationships between medical and dental care.
 - * Demonstrate cultural competency and health literacy when providing dental services to patients.
 - * Evaluate sharpness of instruments and maintain sharpness during all scaling procedures.
 - * Demonstrate effective pain management techniques on clinical patients and minimize tissue discomfort for post-operative care.
 - * Summarize and record all assessments, observations and procedures in Subjective, Objective, Assessment, and Plan (SOAP) format.
- Prerequisite(s): DEHY1404, DEHY1486, DEHY1468.
(6 C: 0 lect/pres, 6 lab, 0 other)

DEHY 1490 - Dental Hygiene Licensure and Jurisprudence

This lecture course will include instruction on the process of taking the Dental Hygiene National Board, the Central Regional Dental Testing Service (CRDTS) examination and the Minnesota Jurisprudence exam. It will cover areas of law and legislation as they relate to the dental profession. This course will look at the Minnesota Board of Dentistry, their responsibilities and how they are involved with legal actions. This course will also prepare the dental hygienist for ethical issues in the profession including mandated reporting.

Student Learning Outcomes:

- * Recognize criteria for reporting child abuse.
 - * Describe and complete the process of applying for Dental Hygiene National Boards.
 - * Describe the periodontal and calculus requirements for the CRDTS board exam.
 - * Describe and complete the process of applying for CRDTS board exam.
 - * Prepare for the Minnesota Jurisprudence exam.
 - * Develop an awareness of ethical dilemmas encountered in the practice of dental hygiene.
 - * Identify legal issues relevant to the various roles of the dental hygienist.
- (1 C: 1 lect/pres, 0 lab, 0 other)

DENT 1400 - Dental Sciences

This course is designed to provide fundamental knowledge of embryonic development pertaining to the face and oral cavity, development of the hard and soft tissues, oral histology and the terminology related to the oral cavity and anatomy of the teeth. Students will be introduced to the various structures and functions of the head and neck and their relationship to the oral cavity and dentistry. Characteristic supporting structures are studied along with an introduction to general anatomy and physiology.

Student Learning Outcomes:

- * Identify the stages of development with emphasis on the formation of the teeth and structures of the oral cavity.

- * Discuss genetic and environmental disturbances that can have an impact on dental development.
- * Discuss sensory intervention of the head and neck.
- * List and explain the body systems and their effects on the overall health of the patient.
- * Identify salivary glands related to maintaining the integrity of the tooth surfaces and their function in the oral cavity as well as in the digestion process.
- * Identify and label bones of the cranium and face and their associated landmarks.
- * Locate and identify the muscles of the head and neck and explain their relationship with facial expression, mastication and movement.
- * List the components of the temporomandibular joint and its relationship to mastication and speech.
- * Identify and discuss the regions of the face and facial features used for clinical applications in dentistry.
- * Diagram anatomic parts of a tooth, supporting structures and oral mucosa surrounding the teeth and oral cavity.
- * Locate teeth using individual characteristics and numbering systems within the maxillary and mandibular arches.
- * Compare and contrast the features of the primary and permanent dentitions.
- * Explain how size, shape and location of teeth relate to function.

Prerequisite(s): READ0304 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

DENT 1405 - Introduction to Dental Assisting

This course combines lecture and laboratory practice to acquaint the student to the fundamentals of working as a chairside assistant in a dental office. The student will be introduced to numbering systems and basic instruments and equipment utilized in dental procedures. Emphasis is placed on the proper technique of hand washing, patient seating and dismissal and oral evacuation while maintaining infection control protocols and following disinfection and sterilization guidelines. Students will apply knowledge and complete clinical records including medical/dental histories and vital signs.

Student Learning Outcomes:

- * Identify basic dental instruments and equipment
- * Recognize numbering systems of the teeth
- * Complete clinical records and record medical/dental histories and vital signs
- * Describe and prepare the dental treatment area for patient care and apply concepts of patient, operator and assisting positions while performing oral evacuation
- * Apply infection control protocols and concepts of disinfection and sterilization before and after performing chairside procedures

(2 C: 1 lect/pres, 1 lab, 0 other)

DENT 1413 - Preclinical Dental Assisting

This course is designed to provide the student with the knowledge necessary to evaluate and understand medical conditions, symptoms and treatments in order to function effectively as part of the dental team in medical emergencies. The student will be familiar with the fundamentals of pharmacology and drugs used in dentistry as well as their effects and interactions. The course will also introduce the student to preventive dentistry and basic nutritional concepts and their practical applications as it relates to oral disease.

Student Learning Outcomes:

A student successfully completing this course will

- * Recognize various medical conditions, indications and contraindications of drugs used and demonstrate protocols for managing compromised patients and medical emergencies in the dental office.
- * Identify general concepts involved in pharmacology including types, sources and categories of drugs as well as medical abbreviations and symbols used in prescription writing.
- * Differentiate key nutrients and their primary functions providing insight for making healthy food choices as a means for evaluating dietary intake.
- * Relate the biochemical nature of nutrients to oral conditions, the impact of nutritional education and the psychosocial aspects of food and eating.

(2 C: 2 lect/pres, 0 lab, 0 other)

DENT 1415 - Infection Control in the Dental Environment

This course will enable the dental assisting student to function effectively as part of the dental health team within the concepts of infection control, the bloodborne pathogens and hazard communication standards. It will include infection control

recommendations for dentistry from the CDC (Center for Disease Control and Prevention), OSHA (Occupational Safety and Health Administration), OSAP (Organization for Safety and Asepsis) and the ADA (American Dental Association) protecting the patient and the dental health care worker. Topics of discussion include but are not limited to microorganisms and infectious diseases and their means of transmission, instrument processing, surface and equipment asepsis and managing chemicals safely in the dental office.

Student Learning Outcomes:

- * Recognize the role played by governmental, state and professional organizations in relationship to infection control in dentistry.
- * Explain the concepts of how microorganisms cause diseases including types and stages of infections and the function of the immune system in relation to breaking the chain of disease transmission.
- * Describe the rationale for performing infection control procedures utilized to interfere with the mode of transmission of microbial spread in the dental office.
- * Explain the components of the Occupational Safety and Health Administration Bloodborne Pathogen Standard as it relates to infection control protocols in dentistry.
- * Recognize the principles and techniques of disinfection and instrument processing and sterilization according to specified guidelines.
- * Explain the components of the Occupational Safety and Health Administration Hazard Communication Program in relation to chemical and waste management in the dental setting.

(2 C: 2 lect/pres, 0 lab, 0 other)

DENT 1425 - Chairside Assisting I

This course is designed to continue the students' education in basic dental assisting with emphasis on instrument identification, charting, anesthesia and instrument transfer in general dentistry. Students will perform chairside techniques and follow infection control protocols in the dental clinic and utilize dental software to record clinical data. Students will also increase oral communications skills by instructing patients in oral hygiene and preventive care.

Student Learning Outcomes:

- * Apply infection control and safety measures within OSHA, ADA, CDA guidelines to protect the patient and dental personnel while working in the dental clinic
- * Demonstrate knowledge of dental equipment, anesthetics, hand and rotary instruments while performing chairside techniques
- * Identify instruments, supplies and equipment necessary for restorative procedures utilized in general dentistry
- * Assist in the collection of diagnostic data and maintain patient clinical records utilizing manual and dental software systems
- * Understand concepts of preventive dentistry while communicating oral hygiene instruction to patients in a clinical setting

Prerequisite(s): DENT1405. (3 C: 1 lect/pres, 2 lab, 0 other)

DENT 1435 - Dental Materials

This course is designed to introduce the student to dental materials and techniques utilized for various laboratory, restorative and clinical applications. It includes both didactic information and laboratory practice with products including gypsum, impression materials, waxes, cements, restorative materials and thermoplastic resins. Safety is emphasized.

Student Learning Outcomes:

- * Classify individual gypsum materials and correctly manipulate according to its use.
- * Relate the use of impression materials to their clinical application.
- * Classify waxes and explain their clinical application.
- * Distinguish the differences of various dental cements and correctly manipulate according to its clinical application.
- * Comprehend uses of individual restorative materials and correctly manipulate according to its clinical application.
- * Comprehend use of resins (acrylic and/or thermoplastic) and manipulate according to its application.
- * Function within current industry standards for infection control and personal safety.

Prerequisite(s): DENT1400.
(3 C: 2 lect/pres, 1 lab, 0 other)

DENT 1441 - Dental Radiology I

This course combines lecture and laboratory practice to introduce dental assisting

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students to the knowledge and skills required in dental radiology. The course introduces students to various full mouth dental image surveys and provides instruction on the paralleling and bisecting techniques. Concepts include; dental image anatomy, pathology, intraoral and extraoral imaging, processing, critiquing skills, quality assurance and infection control. Laboratory practice is provided on skulls and teaching manikins.

Student Learning Outcomes:

- * Demonstrate techniques to produce diagnostic dental image surveys on manikins.
- * Describe and practice the use of dental imaging equipment and processing procedures.
- * Demonstrate competency in mounting and critiquing dental image surveys.
- * Demonstrate radiation health protection techniques and infection control.
- * Identify anatomical landmarks and pathologies on dental images.

Prerequisite(s): DENT1400.

(3 C: 1 lect/pres, 2 lab, 0 other)

DENT 1445 - Expanded Functions I

This course is an introduction to expanded functions that are delegated to the licensed dental assistant in the State of Minnesota. The course combines lecture, laboratory and clinical instruction and experience performing functions according to predetermined criteria utilizing typodonts, manikins and classmates. Infection control, safety and proper patient management will be reviewed.

Student Learning Outcomes:

- * Describe benefits, types and characteristics of topical fluoride and demonstrate various methods of application.
- * Recognize supporting structures of the oral cavity and demonstrate proper sizing, loading and seating of the tray while taking an alginate impression and appropriate bite registrations.
- * Identify the procedural steps in preparing a dental dam and demonstrate the steps in applying and removing the dental dam.
- * Assess the purpose and action of topical medications and demonstrate the application technique as prescribed.
- * Describe classifications, examples, distribution and the removal process or treatment (including bleaching techniques) of common stains seen in a patients oral cavity.
- * Defend indications and contraindications for the use of pits and fissure sealants and demonstrate procedural steps in etching appropriate surfaces and applying sealants.
- * Identify instruments, supplies and equipment and prepare tray set-ups associated with performing designated expanded functions.
- * Demonstrate competence in preclinical and clinical levels as indicated by the Minnesota Board of Dentistry in the procedural steps of expanded functions covered in this course.
- * Demonstrate infection control protocols and safety precautions during laboratory and clinical procedures.

Prerequisite(s): DENT1405.

(3 C: 1 lect/pres, 2 lab, 0 other)

DENT 2406 - Dental Health

This course will provide an overview of pathological conditions and developmental disorders of the oral cavity. Students will recognize the appearance and maintenance of healthy oral tissue as well as anomalies of the teeth and abnormal conditions of surrounding tissues. Students will apply their knowledge while presenting oral hygiene instructions and develop citizenship skills through service learning projects.

Student Learning Outcomes:

- * Compare and contrast characteristics of healthy oral tissue with pathological conditions of the oral cavity.
- * Differentiate developmental disorders and anomalies of the teeth and surrounding tissues.
- * Summarize characteristics of oral diseases and screening processes and treatments associated with oral cancer.
- * Plan and facilitate a group oral health presentation to a diverse population.
- * Develop citizenship skills and understand what it means to be a contributing member to the community by completing service learning projects.
- * Support and respect concepts of human dignity and appreciate individual differences.

Prerequisite(s): DENT1425. (1 C: 1 lect/pres, 0 lab, 0 other)

DENT 2413 - Dental Practice Management

This course will cover principles and applications related to the management of the dental business office. Topics discussed include appointment control, telephone techniques, financial records maintenance, third-party reimbursement forms, HIPAA regulations, supply inventory and business operating systems. Emphasis will be placed on job seeking skills and developing a professional portfolio.

Student Learning Outcomes:

- * Develop dental software skills by completing pre-treatment estimates and third-party reimbursement forms
- * Apply knowledge utilized in business operation systems to include appointment scheduling, record keeping and inventory management
- * Apply knowledge utilized in financial management to include accounts payable, accounts receivable and dental insurance following HIPAA guidelines
- * Assemble an employment professional portfolio
- * Prepare a resume, cover letter and follow-up letter necessary to attain employment
- * Relate staff/patient interactions as they pertain to the dental business office through the use of role-play scenarios

Prerequisite(s): DENT2424.

(2 C: 2 lect/pres, 0 lab, 0 other)

DENT 2424 - Chairside Assisting II

This course the student will be introduced to the different specialties in dentistry, specifically: endodontics, oral surgery, prosthodontics, periodontics, and pediatric dentistry. Through lecture and instrument identification, the student will become familiar with the procedures and instruments used in each specialty. Current concepts of chairside assisting in general dentistry as well as dental specialties are presented with emphasis on the utilization of the dental assistant.

Student Learning Outcomes:

- * Explain the procedures performed within each specialty of dentistry and its relationship with general dentistry.
- * Summarize the need for Pediatric dentistry relating to long term oral health of patients.
- * Compare and contrast surgical and non-surgical procedures utilized in Periodontic dentistry.
- * Categorize instruments utilized in Oral and Maxillofacial surgery.
- * Justify endodontic treatment relating to overall health of the patient.
- * Compare and contrast fixed and removable dental prosthetics.
- * Demonstrate appropriate adaptation for patients with special needs.
- * Demonstrate knowledge of dental procedures to be performed and prepare tray set-ups for the various procedures in each specialty.
- * Select and arrange armamentarium necessary for treatment in restorative dentistry and dental specialties.
- * Demonstrate job entry level competence using instrument transfer techniques while assisting for specific dental procedures.
- * Demonstrate skills necessary to chart and record medical and dental histories.
- * Apply patient management skills appropriate for the communication of pre-operative and post-operative instructions to patients.
- * Apply infection control protocol and safety precautions during laboratory and clinical procedures according to regulating agencies.
- * Utilize appropriate positioning for operator and assistant while performing dental procedures.

Prerequisite(s): DENT1425.

(4 C: 2 lect/pres, 2 lab, 0 other)

DENT 2447 - Dental Radiology II

This course combines lecture and laboratory practice to expand on knowledge and skills in dental radiology. Radiation characteristics, the geometry of image formation, biological effects and dosimetry are included. Operator safety, patient safety, and infection control procedures are expanded. Quality assurance and radiology regulations are stressed. Clinical practice is heightened to include patients. The radiographer's role as it pertains to patient relations, education, and patients with special needs are included.

Student Learning Outcomes:

- * Demonstrate knowledge and skills to produce diagnostic dental image surveys on patients as indicated by the MN Board of Dentistry.
- * Explain the effects of radiation characteristics on an image (density, contrast, sharpness, magnification, and distortion)

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- * Explain dosimetry, the effects of ionizing radiation on living tissue and protection procedures for the patient, operator and other personnel.
 - * Demonstrate infection control techniques, quality assurance and describe radiology regulations.
 - * Explain radiographer expectations including: patient relations, education, management and special needs.
 - * Demonstrate ethical conduct, moral attitudes and principles essential when treating patients from diverse populations.
- Prerequisite(s): DENT1441.
(3 C: 1 lect/pres, 2 lab, 0 other)

DENT 2454 - Expanded Functions II

This course is a continuation of Expanded Functions I and will provide the student with the background knowledge and necessary skills to perform expanded functions that are delegated to the licensed dental assistant according to the Minnesota Dental Practice Act. This course combines lecture, laboratory and clinical instruction and experience performing the advanced functions according to predetermined criteria utilizing typodonts, manikins, and patients. Infection control, safety, and patient management will be emphasized.

Student Learning Outcomes:

- * Contrast classifications, examples, distribution and the removal process or treatment (including bleaching techniques) of common stains seen in a patient's oral cavity.
 - * Compare polishing agents and demonstrate mechanical polishing techniques and operator/patient positions while performing a coronal polish.
 - * Demonstrate procedural steps in etching appropriate surfaces and applying and adjusting pit and fissure sealants.
 - * Classify the angles of malocclusion and identify terminology as it relates to orthodontic treatment and demonstrate procedures performed in an orthodontic office as it specifically relates to the designated orthodontic expanded functions.
 - * Explain indications and contraindications and pharmacological effects of nitrous oxide and demonstrate techniques in the administration and monitoring of nitrous oxide-oxygen relative analgesia.
 - * Demonstrate the techniques and procedure for removing excess cement.
 - * Explain the purpose of sutures and suturing techniques and demonstrate the removal process.
 - * Compare the types, brands names, purpose and composition of various dressings and demonstrate the application and removal technique.
 - * Distinguish clinical uses for gingival displacement and its limitations and clinical contraindications.
 - * Summarize the purposes, features and uses of temporary restorations and fabricate a variety of provisional restorations utilizing different materials and armamentarium.
 - * Apply knowledge in each expanded function and demonstrate competence in preclinical and clinical levels as indicated by the Minnesota Board of Dentistry in the procedural steps for expanded functions covered in this course.
 - * Utilize infection control protocols, safety precautions and patient management during preclinical and clinical procedures.
 - * Demonstrate ethical conduct, moral attitudes and principles essential when treating all patients including those from diverse populations.
- Prerequisite(s): DENT1445.
(4 C: 2 lect/pres, 2 lab, 0 other)

DENT 2461 - Internship

Clinical experience assisting a dentist is an integral part of the dental assistant program designed to perfect the students competence in performing chairside assisting and expanded functions. Each student will be assigned to two different clinics or offices for clinical experience. For each rotation, the student is given the opportunity to work with one or more dentists and auxiliary in a clinical office. The intent of each extramural assignment is to allow the student to further develop speed and accuracy of the skills learned throughout the program. Integration of knowledge and skills to a job entry level by hands-on experience and evaluation of competence is expected.

Student Learning Outcomes:

- * Comply with CODA (Commission on Dental Accreditation) requirements for clinical externship experiences.
- * Apply and perform essential dental assisting and chairside assisting skills previously learned in the preclinical and clinical dental assisting courses.
- * Apply and perform dental practice management skills previously learned in the

dental assisting curriculum.

- * Apply and perform laboratory assistant skills previously learned in the preclinical dental assisting curriculum.
 - * Apply and perform expanded functions delegated duties previously learn in the preclinical and clinical dental assisting courses.
 - * Demonstrate technical competence, professional attributes and ethical standards during patient care including those from diverse populations.
 - * Demonstrate infection control and hazard control protocols consistent with published professional guidelines.
- Prerequisite(s): DENT2424.
(7 C: 0 lect/pres, 0 lab, 7 other)

DENT 2486 - Internship Seminar

Internship seminar coincides with Internship II and provides students with opportunities to share clinical experiences with their classmates and faculty. It combines the didactic training with the internship experience in preparation for the Dental Assisting National Board (DANB) General Chairside and the Minnesota State licensure examinations. Students are expected to complete and turn in written reports relating to functions performed in the clinical internship facility. The course will also provide the necessary information to apply for licensure with the State Board of Dentistry and to establish and maintain a professional portfolio.

Student Learning Outcomes:

- * Complete weekly time sheets and reports and student evaluations to assess common dental materials and techniques utilized in general/specialty offices/clinics.
 - * Identify and focus on deficient areas to increase awareness of proper studying and problem solving abilities.
 - * Complete the necessary review sheets/assignments to successfully write the Dental Assisting National Board (DANB) General Chairside exam and the Minnesota State Licensure exam.
 - * Provide the opportunity to work with SCTCC placement office in securing and maintaining employment.
 - * Participate in group discussions relating to clinical experiences and problem solving skills.
- Prerequisite(s): DENT2424.
(1 C: 1 lect/pres, 0 lab, 0 other)

DENT 2488 - Dental Ethics and Jurisprudence

The course focuses on the legal and ethical standards that govern the practice of dentistry. It includes a guided process to assist the student in reviewing and successfully passing the Minnesota Jurisprudence examination which is a requirement to become a licensed dental assistant.

Student Learning Outcomes:

- * Discuss ethical and legal issues as they relate to dentistry
 - * Successfully write the Minnesota Board of Dentistry Jurisprudence examination
 - * Be aware of legal and ethical ramifications of licensure
 - * Develop a personal plan to meet the continuing education requirements as established by the Minnesota State Board of Dentistry as well as for life long learning
- (1 C: 1 lect/pres, 0 lab, 0 other)

DMSG 1401 - Introduction to the Sonography Field

This course will introduce students to the sonography field, covering the origins and evolution of Diagnostic Medical Sonography. The student will learn the sonographer profile, sonographer safety; legal, ethical, and legislative issues; current sonographic examinations; and basic patient care skills.

Student Learning Outcomes:

- * Understand the evolutionary history of diagnostic ultrasound and the aptitude, abilities, and skills needed to be a sonographer
- * Explain the differences among accreditation, certification, and registration
- * Demonstrate awareness and understanding of safety considerations and professional confidentiality when dealing with patient care
- * Identify ergonomic methods of prevention of musculoskeletal injuries in the field of sonography
- * Determine patient preparations for abdominal, obstetric-gynecologic, and vascular procedures, and state the major specialty sonographic examinations
- * Explain how patients, peers, and other health care professionals interact in a considerate and professional manner

- * Observe various ultrasound procedures performed in the simulated lab
- * Prepare and present a paper on a topic of choice that relates to the ultrasound field

Prerequisite(s): MATH1300, PHYS1300, BGLY2310, BGLY2320.
(1 C: 1 lect/pres, 0 lab, 0 other)

DMSG 1402 - Ultrasound Cross-Sectional Anatomy I

This course focuses on a detailed study of the normal anatomy and physiology of the abdomen, neck, musculoskeletal, neonatal brain and non-cardiac chest using ultrasound. Emphasis will focus on structure orientation and its significance in cross-sections of anatomy. Students will be able to determine normal sonographic appearances and recognize variances and sizes of organs and vessels. This course will introduce the hemodynamics patterns and spectral waveforms found in the abdominal vasculature.

Student Learning Outcomes:

- * Determine normal sonographic cross-sectional anatomy and sizes of the abdominal organs.
 - * Identify the principal functions of the abdomen organs.
 - * Determine normal sonographic cross-sectional anatomy and sizes of the neck, musculoskeletal and non-cardiac chest.
 - * Identify the principal functions of the thyroid and parathyroid glands.
 - * Interpret normal ultrasound appearances and locations of abdominal vasculature.
 - * Identify the principal functions of the abdomen vessels.
 - * Analyze characteristics of normal Doppler flow signals of abdominal vessels.
 - * Identify normal neonatal brain anatomy and functions.
 - * Interprets normal ultrasound appearances of the neonatal head.
 - * Define how body structure relationships apply to sonography.
 - * Explain the importance of using two different scanning planes.
- (3 C: 3 lect/pres, 0 lab, 0 other)

DMSG 1404 - Diagnostic Medical Sonography I

Students will be exposed to different pathologies of the abdomen organs, blood vessels, thyroid, and neonatal head. This course will focus on ultrasound findings, scanning techniques, patient history, laboratory data, and other imaging modalities to help better understand how to interpret pathology. Emphasis will focus on descriptive and anatomical terminology, clinic data, grayscale imaging and Doppler characteristics as seen with various pathologies.

Student Learning Outcomes:

- * Evaluate normal and abnormal ultrasound appearances of the abdominal organs.
 - * Determine normal and abnormal ultrasound appearances of the thyroid and parathyroid glands.
 - * Investigate pertinent patient history and laboratory data that apply to the abdomen, thyroid and parathyroid.
 - * Evaluate scanning techniques, transducer selection and scanning protocols of the abdomen, thyroid and neonatal head.
 - * Identify ultrasound artifacts.
 - * Analyze Doppler characteristics of the abdomen and thyroid vessels.
 - * Complete mock diagnostic medical sonographer worksheets.
 - * Incorporate pathology case studies of abdominal organs and blood vessels, neck, musculoskeletal, and neonatal brain into sonography practice.
- (3 C: 3 lect/pres, 0 lab, 0 other)

DMSG 1405 - Ultrasound Physics

A study of the physical principles and mathematical equations required to understand diagnostic ultrasound. Course includes parameters of sound waves, pulsed and continuous wave principles, laws of reflection and refraction and the role of piezoelectricity in the production and processing of ultrasound.

Student Learning Outcomes:

- * Define selective terms in the production and use of ultrasound and Doppler
- * List and describe the properties of sound waves including pulse and continuous wave
- * Identify and calculate the mechanisms of attenuation and impedance
- * Compare and contrast ultrasound transducers and their components
- * List and describe factors affecting resolution to include reflection and refraction
- * Describe the Doppler effect and interpret components of the Doppler equation
- * Compare and contrast the differences between imaging modes
- * Diagram and describe the role of the scan converter and all other major components of the US machine

- * Demonstrate quality assurance through the use of a phantom in the lab
(3 C: 3 lect/pres, 0 lab, 0 other)

DMSG 1406 - Clinical Ultrasound Lab I

Introduction to the aspects of sonography in a hospital or simulated clinical laboratory setting. Emphasis will be placed on instrumentation, on imaging, and identification of anatomy of the abdomen and thyroid.

Student Learning Outcomes:

- * Demonstrate aspects of patient care pertaining to ultrasonography
 - * Perform ultrasound instrumentation, transducer care and maintenance
 - * Perform and observe abdominal and thyroid ultrasound scans in a hospital or simulated clinical setting following set protocols
 - * Perform measurements on ultrasound exams of the abdomen and thyroid
 - * Document patient history, measurements and comments on an ultrasound technologist worksheet
 - * Perform Doppler spectral waveform images of the abdomen vessels
- (3 C: 0 lect/pres, 3 lab, 0 other)

DMSG 1409 - Professional Development and Growth in Sonography

This course is designed to transition students from the classroom and lab setting into a clinical setting. Students will be able to recognize the functional skills required to be a diagnostic medical sonographer. Students will observe the day-to-day operations of different ultrasound departments and share their personal reflections.

Student Learning Outcomes:

- * Define the role of a diagnostic medical sonographer.
 - * Recognize the obligations of the sonographer to patients, institution, and self.
 - * Identify aptitudes, abilities and functional skills to be a sonographer.
 - * Identify the impact of cultural diversity in a clinical setting.
 - * Analyze patient reactions to illness.
 - * Apply infection control and safety measures when at a clinical setting.
 - * Establish patient communication skills and teamwork in a clinical setting.
 - * Recognize the various ultrasound exams that are completed in an ultrasound department.
 - * Identify different ultrasound equipment used in ultrasound departments.
- (1 C: 1 lect/pres, 0 lab, 0 other)

DMSG 1410 - Ultrasound Cross-Sectional Anatomy II

This course focuses on a detailed study of the normal anatomy and physiology of the male and female reproductive system, obstetrics covering all trimesters, breast sonography and vascular systems as it relates to the ultrasound field. Students will be able determine normal sonographic appearances and recognize variances and sizes of organs and vessels. This course will explore the hemodynamics patterns and spectral waveforms found in the male and female pelvis and obstetrics.

Student Learning Outcomes:

- * Determine sonographic cross-sectional anatomy and functions of the male and female reproductive systems.
- * Determine the normal ultrasound appearance of the gestational sac and early embryo.
- * Identify normal sonographic anatomy of the second and third trimester.
- * Identify sonographic anatomy and functions of the placenta throughout all trimesters.
- * Perform sonographic measurements of the fetus during the first, second, and third trimester.
- * Determine sonographic cross-sectional anatomy and functions of the female breast.
- * Identify normal sonographic anatomy of the extracranial cerebrovascular and peripheral vascular systems.
- * Differentiate how gray scale ultrasound, color Doppler and spectral Doppler are used in the evaluation of Vascular systems.
- * List the applications of gynecologic and obstetric 3D acquisition.

Prerequisite(s): DMSG1402, DMSG1406, DMSG1404, DMSG1401, DMSG1405
(3 C: 3 lect/pres, 0 lab, 0 other)

DMSG 1411 - Diagnostic Medical Sonography II

Students will be exposed to different pathologies of the male and female reproductive systems, obstetrics covering all trimesters, breast and vascular systems. This course will focus on ultrasound findings, scanning techniques, patient history, laboratory data, and other imaging modalities to help better understand

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how to interpret pathology. Emphasis will focus on descriptive and anatomical terminology, clinic data, grayscale imaging, protocols, and Doppler characteristics as seen with various pathologies.

Student Learning Outcomes:

- * Determine sonographic technique and protocols used to evaluate the male and female pelvis.
 - * Identify normal and abnormal sonographic appearances of the male and female pelvis.
 - * Determine sonographic technique and protocol used to evaluate the female breast.
 - * Identify normal and abnormal sonographic appearances of the female breast.
 - * Evaluate sonographic technique and protocols used for the first, second and third trimester obstetric ultrasound.
 - * Identify normal and abnormal sonographic appearances of the fetus during the first, second and third trimester.
 - * Conduct obstetric measurements used for gestational age and fetal growth assessment.
 - * List risk factors associated with vascular disease.
 - * Differentiate sonographic techniques and protocols used to evaluate the extracranial cerebrovascular and peripheral vascular systems.
 - * Recognize sonographic vascular anatomy of the extracranial cerebrovascular and peripheral vascular systems, along with the use of Doppler to determine the presence of vascular disease.
- Prerequisite(s): DMSG1402, DMSG1406, DMSG1404, DMSG1401, DMSG1405.(3 C: 3 lect/pres, 0 lab, 0 other)

DMSG 1412 - Clinical Ultrasound Lab II

Practical training in a hospital or simulated clinical laboratory will focus on completing and becoming proficient in scanning of the human body. Emphasis will be placed on instrumentation, protocol, record findings along with associated calculations, and anatomy identification of the abdomen, thyroid, pelvis, obstetrics, breast and vascular systems.

Student Learning Outcomes:

- * Explain aspects of patient care pertaining to sonography.
 - * Perform proper ultrasound instrumentation, transducer care and maintenance.
 - * Perform abdominal, thyroid, pelvic, obstetric, breast, and vascular ultrasound scans following set protocols.
 - * List ultrasound protocol for scrotum and prostate imaging.
 - * Perform various ultrasound measurements following set protocols.
 - * Generate patient history, measurements, and comments on a sonographer report.
- Prerequisite(s): DMSG1402, DMSG1406, DMSG1404, DMSG1401, DMSG1405.(5 C: 0 lect/pres, 5 lab, 0 other)

DMSG 2407 - Sonography Board Reviews

This course will help students prepare to take the American Registry for Diagnostic Medical Sonography (ARDMS) specialty examinations in Physics, Abdomen and OB/GYN in a simulated atmosphere. It is designed to be used as an edition to your regular study and as a method to determine your strengths and weaknesses so that you can study more effectively. This course will cover test taking skills and preparation on the computer. Students will be able to better recognize pathology better through case study presentations.

Student Learning Outcomes:

- * Apply test taking strategies to successfully complete registry exams and specialty exams.
- * Identify testing strengths and weaknesses through self-assessment.
- * Perform mock examinations in a simulated exam room on a computer.
- * Interpret mock examination results.
- * Present case studies.

Prerequisite(s): DMSG1412, DMSG1409, DMSG1410, DMSG1411.
(1 C: 1 lect/pres, 0 lab, 0 other)

DMSG 2412 - Clinical Ultrasound Internship I

Students are assigned to various clinical rotations where they gain hands-on experience under the direction and supervision of assigned clinical preceptors. Students will focus on becoming proficient in the scanning of, abdominal organs, superficial structures, pelvis, obstetrics, and vascular systems. Students will expand scanning and patient care skills and as the semester progresses more clinical responsibilities will be given.

Student Learning Outcomes:

- * Conduct appropriate patient care in a hospital or clinical setting.
- * Demonstrate practical communication skills that enable effective cross-cultural work with health professionals and clients with backgrounds different from their own.
- * Perform infection control guidelines.
- * Participate in the day-to-day operations of an ultrasound department.
- * Display teamwork in an ultrasound department.
- * Perform an examination of any abdominal and pelvic organs, gravid uterus, superficial structures and vascular procedures.
- * Record and process for display the images necessary for a diagnostic ultrasound examination.
- * Interpret ultrasound exams that are performed in an ultrasound department.
- * Describes normal and pathological conditions on sonograms that are routinely examined in an ultrasound department.
- * Record patient history, measurements, and ultrasound findings on a sonography report.
- * Translate ultrasound findings to a reading physician.

Prerequisite(s): DMSG1409, DMSG1410, DMSG1411, DMSG1412.

(11 C: 0 lect/pres, 0 lab, 11 other)

DMSG 2413 - Clinical Ultrasound Internship II

This is the final course in the Sonography Program. The student will focus on becoming proficient in the scanning of the human body. Students will perform under the guidance and supervision of assigned preceptors, in hands-on scanning in abdominal, superficial structures, OB/GYN, and vascular systems. Upon completion of this internship, students will be able to perform routine duties and be ready for the workplace as a Diagnostic Medical Sonographer.

Student Learning Outcomes:

- * Apply appropriate patient care in a hospital or clinical setting.
- * Model infection control.
- * Recognize the impact of transcultural communications and the beliefs on diagnosis and treatment.
- * Demonstrate sensitivity to diverse clinical populations.
- * Perform the day-to-day operations that are routinely done in an ultrasound department while being part of the team in an ultrasound department.
- * Perform all ultrasound examinations of any abdominal and pelvic organs, gravid uterus, superficial structures and vascular procedures routinely examined in a diagnostic ultrasound department.
- * Record and process high quality images necessary for a diagnostic ultrasound examination.
- * Interpret ultrasound exams that are performed in an ultrasound department.
- * Determine normal and pathological conditions on sonograms that are routinely examined in an ultrasound department.
- * Record patient history, measurements, and ultrasound findings on a sonography report.
- * Translate ultrasound findings to a reading physician.

Prerequisite(s): DMSG2412.

(4 C: 0 lect/pres, 0 lab, 4 other)

DVRS 1304 - Diversity and Social Justice

Meets MN Transfer Curriculum Goal Areas 5 and 7 - History/Social, Behavioral Sciences and Human Diversity. Diversity and Social Justice is a course that uses critical thinking and questioning to define, recognize and analyze individual, institutional and cultural/societal racism, sexism, classism, heterosexism and other forms of oppression. It will focus on development of practical skills for eliminating racism, sexism, classism, heterosexism and other oppressive elements from personal, professional and public lives in the United States. Students will learn how to engage respectfully in interpersonal relationships, and empower themselves to act as agents of social change, learning skills to create a more equal and just society.

Student Learning Outcomes:

- * Critically examine ideas about people, perspectives, and experiences that are different than their own.
- * Recognize and evaluate how their experiences impact how they view others.
- * Examine critically, and challenge, unexamined, stereotypical or false beliefs, values, and opinions.
- * Critically examine the dehumanizing biases and misinformation that lead to oppression that various groups in society experience.
- * Discuss the national debates which provide a societal context in which oppres-

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sive behaviors occur.

- * Recognize ideological messages and social control in US culture.
- * Recognize and analyze the prejudices, privilege and power that motivate individual and institutional classism, racism, sexism, heterosexism, and other forms of oppression.
- * Explain the interrelationships of various forms of oppression.
- * Identify respectful interpersonal behaviors, and personal actions for challenging disrespectful behaviors, discrimination and harassment, and skills in creating a more supportive community for all people.
- * Plan constructive ways to act as allies in dealing with conflict, and in channeling personal power toward societal change.
- * Examine successful social movements in the US that have challenged oppression.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

DVRS 2301 - Race and Ethnic Relations

Meets MN Transfer Goal 7 - Human Diversity. This course provides students a framework for exploring and understanding race and ethnicity in our world today. Students will examine their own ethnic heritage and compare and contrast the history of their ethnic group with the experiences of other groups in the U.S.

Student Learning Outcomes:

- * Explain the meanings, origins and uses of race and ethnicity and related concepts
- * Use historical data and the concepts of race and ethnicity to analyze and describe their own heritage
- * Describe the experiences and contributions of race and ethnic groups that are part of U.S. society
- * Explain individual, institutional and systemic factors involved in inequality related to race and ethnicity
- * Understand their own attitudes and behaviors regarding race and ethnic differences

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

EASC 1310 - Meteorology

Meets MN Transfer Goal 3 - Natural Sciences. This is an introductory meteorology course designed for non-science majors. This course focuses on understanding the basic concepts of meteorology by emphasizing observations of the atmosphere and using those observations to explain atmospheric phenomena. This course emphasizes key atmospheric concepts that enable students to understand how science can explain the weather phenomena they see in their daily lives and how these phenomena are connected to short term events such as local weather, severe storms and atmospheric stability and long term effects such as global warming. This course includes a lab component where students will learn to use real data to analyze and predict weather patterns and atmospheric phenomena.

Student Learning Outcomes:

- * Describe the physical processes that affect and create meteorological phenomena
- * Describe the layers and components of the atmosphere and the energy cycle in the atmosphere
- * Interpret temperature cycles in terms of the surface energy budget and atmospheric stability
- * Explain how clouds and precipitation form and describe the different types
- * Explain how weather observations are made and interpreted
- * Explain atmospheric forces and global scale winds, the jet stream, and high and low pressure systems
- * Explain Atmosphere-Ocean interaction and the El-Nino phenomena
- * Describe types of air masses and the formation and types of fronts
- * Explain how surface cyclones and the jet stream interact to create life threatening storms and be able to identify these patterns on satellite images
- * Describe formation and characteristics of different types of thunderstorms and tornados
- * Identify the cause and location of small-scale winds severe turbulence
- * Interpret various types of weather data and use that data to generate numerical weather forecasts
- * Identify climate zones of the world and describe the natural processes that affect global climate and climate changes
- * Explain the feedback mechanisms that stabilize the world climate, discuss hu-

man causes of global climate change, and identify ramifications and options for addressing global warming

- * Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments
 - * Demonstrate and apply critical thinking skills to analyze a variety of weather phenomena
 - * Work cooperatively and effectively in groups engaged in the process of science and show respect for other people's needs, ideas, and feelings
 - * Model professional and responsible behavior by being on time, participating in class discussions and completing assignments on time
 - * Demonstrate effective use of resources including faculty, other students, reference materials, industry sources, and the Internet
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(4 C: 3 lect/pres, 1 lab, 0 other)

ECON 1310 - Personal Finance

Meets MN Transfer Curriculum Goal Area 9 - Ethical and Civic Responsibility. Personal finance is a major part of financial management. Individuals and families obtain, budget, save, and spend monetary resources over time while taking into account a variety of financial risks and future life changes. The content includes: personal finance basics and career planning, financial statements and budgeting, consumer credit, the housing decision, investing ones resources and retirement planning. Personal finance gives students the ability to evaluate a wide range of financial decisions and to build an organized system for the future. Students will understand what it means to make responsible economic decisions and how these choices impact their personal and public life.

Student Learning Outcomes:

- * Create personal financial goals.
- * Evaluate factors that influence employment opportunities.
- * Design a system for maintaining personal financial records.
- * Compare the types of financial institutions.
- * Examine issues of personal and civic responsibility.
- * Apply ethical standards to economic decision making.
- * Examine the concepts of voluntary decision making and responsibility as they relate to personal economic decisions.
- * Examine the connection between personal economic choices and social issues which influence decision making.
- * Demonstrate an understanding of consumer credit and alternatives to measurable debt.
- * Analyze the advantages and disadvantages of major sources of consumer credit.
- * Assess the importance of property and liability insurance.
- * Explain the characteristics of mutual funds.
- * Summarize the importance of retirement planning.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

ECON 1340 - Environmental Economics

Meets MNTC Goal Area 10 - People and the Environment. This course offers an introduction to the methodologies of economic analysis and a broad survey of environmental and natural resource issues applying those methodologies. It emphasizes the price system, markets, public choice theory and the scientific method. Students will investigate a range of topics including global warming, energy, air and water pollution, and public policy responses. This course has broad general education applications but is especially appropriate for economics, public policy and political science majors.

Student Learning Outcomes:

- * Understand basic market functions, and the conditions under which markets fail.
- * Demonstrate familiarity with environmental and natural resource issues.
- * Synthesize relevant material from diverse sources and points of view regarding environmental challenges today and related public policy.
- * Analyze primary and secondary sources of information regarding environmental challenges today and related public policy.
- * Critically evaluate public policy affecting environmental and natural resource issues.
- * Formulate and defend responses to environmental and natural resource challenges.
- * Use economic modeling processes to depict and analyze environmental issues.

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- * Apply cost/benefit analysis to environmental issues.
 - * Demonstrate proficiency using the elements of the economic way of thinking, including tradeoffs, opportunity costs, marginal analysis, efficiency and the gains from trade.
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

ECON 2320 - Introduction to Macroeconomics

Meets MN Transfer Curriculum Goal Area 5 - History and the Social and Behavioral Sciences. Macroeconomics is the part of economic analysis that studies the behavior of the economy as a whole. The content includes: economic growth, national income, measurement of economic performance, understanding economic fluctuations, determination of output, price level, inflation, deficits, knowledge of monetary and fiscal policy, and unemployment in the United States. Economic literacy gives people the tools for understanding the nations economic world and how to interpret events that will either directly or indirectly affect them. Nations benefit from having an economically literate population because it improves the public's ability to comprehend and evaluate critical issues.

Student Learning Outcomes:

- * Comprehend the difference between microeconomics and macroeconomics.
- * Examine relationships among economic efficiency, growth and employment.
- * Contrast and differentiate the laws of supply and demand, and the equilibrium within a market.
- * Explain characteristics of the market system, international trade, and currency exchange.
- * Calculate Gross Domestic Product.
- * Compare the business cycle, unemployment, and inflation.
- * Distinguish between income-consumption and income-saving relationships.
- * Interpret the factors that determine aggregate expenditures.
- * Discuss and analyze fiscal and monetary policies and their role within the business cycle.
- * Comprehend the functions of money and the money supply.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

ECON 2330 - Introduction to Microeconomics

Meets MN Transfer Curriculum Goal Area 5 - History and the Social and Behavioral Sciences. Microeconomics is the study of decision making undertaken by individuals (or households) and firms. The content includes: individual units (industries, firms, and households), determination of prices and quantities, measurement of costs and productivity, individual markets, specific goods and services, and resource prices. Economic literacy gives people the tools for understanding the nations economic world and how to interpret events that will either directly or indirectly affect them. Modern economic theory blends micro and macro concepts. Nations benefit from having an economically literate population who can evaluate critical issues faced by individuals (or households) and firms.

Student Learning Outcomes:

- * Comprehend the difference between microeconomics and macroeconomics.
- * Evaluate the nature and methods of economics, and analyze production possibilities.
- * Contrast and differentiate the laws of supply and demand, and the attainment of equilibrium within a market.
- * Explain characteristics of the market system.
- * Interpret price and income elasticity of demand.
- * Analyze consumer behavior and utility maximization.
- * Describe the costs of production on productivity.
- * Summarize pure competition and the impacts of this market structure on economic efficiency.
- * Predict how pure monopoly impacts the market structure and economic efficiency.
- * Appraise government and market failure.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

ELEC 1502 - Wiring and Materials I

This is the initial course in a series of courses designed to teach students about the tools and material that are used in the electrical industry. Through the semester students will be required to complete about 40 different projects. The initial projects are designed to introduce students to the basic cutting tools that they will

be required to use in the Electrical industry. How to work safe will be a priority. Students will then be asked to diagram basic circuits, and then build or construct the circuits they designed. The primary wiring method for these projects is NM cable. Advancing, students will be introduced to other wiring methods such as EMT, IMC and RMC.

Student Learning Outcomes:

A student successfully completing this course will:

- * List safety requirements of tools and material
- * Generate simple circuit calculations, layout and drawings.
- * Compile data from the National Electrical Code, and apply it to wiring projects with no National Electrical Code violations
- * Model professional Integrity
- * Perform box fill calculations on all electrical boxes used on wiring projects.
- * Create charts that evaluate different electrical boxes and devices used in industry.
- * Provide evidence of (your) ability to focus on wiring projects and to stay on task.

(5 C: 2 lect/pres, 3 lab, 0 other)

ELEC 1506 - Wiring and Materials II

This course is designed as a continuation of Basic Wiring and Materials I. Students will find themselves working in teams to complete between 30-40 different labs. Some of the projects are designed as introductory, others build on initial concepts and become more complex. Skills that are evaluated tend to be hands on or the ability to work with the tools and electrical material. Students will review NM cable wiring techniques, as well as other wiring methods. Basic EMT conduit bending and calculations are introduced in this class, as well as PVC, RMC and IMC conduit types. Successful students learn the ability to focus on a project and demonstrate the ability to stay on task.

Student Learning Outcomes:

A student successfully completing this course will:

- * Examine safety requirements of the National Electrical Code and NFPA 70E
- * Create circuit calculations and layout with multiple switching and receptacle devices
- * Write service calculations
- * Build an overhead service
- * Compile data from the National Electrical Code and apply it to practical wiring projects
- * Model professional Integrity
- * Perform conduit bends and calculation to an accuracy of 1/8
- * Install GFCI and AFCI equipment into circuits, and test them for accuracy.
- * Build circuits with alternative wiring methods (RMC, IMC, and PVC)
- * Calculate conduit fill
- * Install a row of recess lighting within 1/8 accuracy
- * Explain the difference between types of recess lighting, trims and bulbs.
- * Demonstrate professionalism and team performance attributes.
- * Provide evidence of their ability to focus on wiring projects and to stay on task.

Prerequisite(s): ELEC1502.

(5 C: 2 lect/pres, 3 lab, 0 other)

ELEC 1510 - National Electrical Code I

This course will prepare the students to apply code to the installation of basic wiring. Make aware of laws and licensing of electricians. Use and interpret code general wiring practices. Calculate circuit loads. Calculate feeder demands, service installations, overcurrent protection, and appropriate grounding practices. Utilize tables for conductor size and other purposes.

Student Learning Outcomes:

- * Utilize codebook and interpret code sections
 - * Identify enforcement of the code and the laws governing the electricians
 - * Identify minimum requirements for the installation basic circuits for lighting, equipment and feeder installations
 - * Calculate load requirements for circuits and feeders
 - * Use and interpret tables in the code
- (2 C: 0 lect/pres, 2 lab, 0 other)

ELEC 1515 - National Electrical Code II

This class covers NEC articles 250 thru 490. Students will identify NEC code requirements for the installation of wire, cable, conduit, and wire race ways. Students will connect boxes, switches, transformers, lighting equipment, motors,

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

and motor controls. They will be able to identify hazardous locations.

Student Learning Outcomes:

- * Utilize the general code requirements for building, outdoors, and underground wiring methods.
- * Interpret NEC code tables for the selection of conductors and wiring methods for specific applications.
- * Identifies and selects cable and conduit systems for specific applications.
- * Selects proper boxes, switches, and other devices to meet NEC code requirements.

Prerequisite(s): ELEC1510.

(3 C: 2 lect/pres, 1 lab, 0 other)

ELEC 1518 - Applied Electrical Principles and Formulas

This course will teach students to utilize ohm's law in the application of series, parallel, and combination circuits. Calculate voltage, current and resistance in these applications. Apply power calculation for circuits. Utilize electrical meters. Apply resistance values in the calculation used for equipment and conductors. Describe use, application and the type of batteries. Apply magnetic principles to the operation of electrical equipment. Apply appropriate electrical formulas in the solution of electrical circuits and problems. This is a 4 hour per week lab setting and 6 hour per week in the lecture setting class that covers math and theory in Delmar chapters 1 thru 14 and Singer units 1 thru 14.

Student Learning Outcomes:

- * Evaluate electrical safety issues
- * Calculate series, parallel, and combination circuits for voltage, amperage, resistance, and power.
- * Calculate voltage drop, and select conductors in compliance with the NEC.
- * Interpret results of ammeter, volt meter, and VOM.
- * Classify the common nominal electrical voltages.
- * Identify resistor types and their application in the electrical industry.
- * Analyze electromagnetic principles and their applications in the electrical industry
- * Identify battery types and functions with complete schematics.

Prerequisite(s): MATH0380 or MATH0400.

(5 C: 2 lect/pres, 3 lab, 0 other)

ELEC 1523 - Drafting Blueprint Reading and Specification

This course teaches students to identify construction design of residential and commercial buildings. Application of proper symbols and layout of a workable electrical plan along with specifications will enable students to draft a complete set of construction plans including floor layout, circuit layout, and other equipment as required along with the support of specifications sheets and schedules.

Student Learning Outcomes:

A student successfully completing this course will:

- * Identify electrical, plumbing, heating and general construction symbols and details
- * Illustrate electrical circuit layout design
- * Apply National Electrical Code requirements
- * Draft a model home using CADD Software
- * Perform scaling projects using an architectural scale, and using a tape measure
- * Review a simple scaled construction plan and then layout and square the plan in real footage.
- * Create window and door schedules
- * Analyze and contrast commercial blueprints

(4 C: 4 lect/pres, 0 lab, 0 other)

ELEC 1526 - Applied Electrical Principles and A.C. Fund.

This course teaches students to identify differences in DC and AC circuits. Students will use formulas to calculate voltage, current, and impedance values in AC circuits. Students will implement resistive, inductive, capacitive, and combination circuits. They will explore in phase and out of phase. Leading and lagging power factor will be solved to industry standards. They will calculate mpower factor correction of equipment and feeders. Students will analyze single and three phase systems. Basic motor, generator, and transformer theory will be explored. This is a 4 hour per week lab setting and a 6 hour per week lecture setting class that covers Delmar chapters 15 thru 32 and Singer units 15 thru 24.

Student Learning Outcomes:

- * Evaluate and implement electrical safety procedures.

- * Calculate Ac effects on resistive, inductive, and capacitive circuits.
- * Apply formulas to solve AC impedance problems.
- * Calculate AC voltages for peak, effective, instantaneous and averages values.
- * Calculate volts, amps, ohms, and watts in AC circuits
- * Calculate power factor and correction.
- * Evaluate motors, generators, and transformers.
- * Evaluate single and three phase systems.

Prerequisite(s): ELEC1518.

(5 C: 2 lect/pres, 3 lab, 0 other)

ELEC 1530 - Electric Heat

This course will teach concepts of electric baseboard and plenum heating. Students will also investigate other types of heat and air conditioning methods. Students will learn how to calculate BTUs for heating and cooling applications. Students will physically wire various forms of baseboard heating, and numerous forms of low voltage thermostat controls. Students will work with prints, heating and cooling symbols and related calculations. As students advance, they will explore concepts in off-peak heating and cooling, relationships to the grid, and the age of the smart grid.

Student Learning Outcomes:

- * Layout electrical circuits on a print, and install heating and cooling symbols.
- * Calculate and layout heating and cooling systems
- * Identify electric heat design requirements and components
- * Recognize load management configurations and connections
- * Demonstrate skills of terminating line voltage and low voltage installations and circuits
- * Outline fine points about the electrical grid, off peak electrical usage and smart grid technology including solar and wind technologies

Prerequisite(s): ELEC1502, ELEC1510, ELEC1522.

(2 C: 0 lect/pres, 2 lab, 0 other)

ELEC 1534 - Safety, Certifications and Skills

This course is designed for Construction Electrician Students who have completed the first year of the program. They will have instruction in OSHA, various industry certifications, Industrial jobsite training, advanced blueprint reading, alternative energy options, and training in basic welding and welding safety.

Student Learning Outcomes:

A student successfully completing this course will:

- * Identify electrical, plumbing, heating and general construction symbols and details
- * Illustrate electrical circuit layout design
- * Demonstrate National Electrical Code requirements
- * Draft a model home using CADD software
- * Perform scaling projects using an architectural scale, and using a tape measure
- * Review a simple scaled construction plan, and then layout and square the plan in real footage.
- * Create window and door schedules
- * Students will answer a series of questions by reading through commercial blueprints

(3 C: 1 lect/pres, 2 lab, 0 other)

ELEC 1538 - Industry Skills Development

This course will introduce students to total quality management, team building, and networking. Students will explore their humanitarian responsibility, personal accountability, and develop their organizational and management skills. Students will be responsible for developing a working knowledge of the electrical industry, as well as a personal resume, example of cover letter, and interviewing skills.

Student Learning Outcomes:

- * Develop team building skills.
- * Create working resume, cover letter, and career skills.
- * Practice leadership by participating in MESA or approve club.
- * Complete a community service project.

(1 C: 0 lect/pres, 1 lab, 0 other)

ELEC 2502 - Residential Wiring I

Students will complete the installation of temporary service and installation of permanent service for a residential dwelling and enhance wiring skills by the

rough-in wiring for a residential dwelling. Job skills will be developed as part of this class.

Student Learning Outcomes:

- * Develop an electrical plan for a single family residence.
- * Apply electrical codes to unique applications of residential construction.
- * Select materials and layout rough-in project.
- * Select and apply tools and equipment for project.
- * Complete residential rough-in.
- * Validate project against NEC requirements
- * Document skill development for future employment opportunities.

(2 C: 1 lect/pres, 1 lab, 0 other)

ELEC 2506 - Residential Wiring II

The student will install light fixtures, trim out outlets and switches, wire a furnace, water heater, range and dryer and complete the final installation of a residential dwelling for a final code inspection.

Student Learning Outcomes:

- * Plan material and equipment to finish wiring a home
- * Plan/packet tailored to student's needs will be developed by student to match the career job they want
- * Demonstrate electrical troubleshooting skills
- * Use NEC Code as a reference in their electrical work
- * Develop their skills to plan and install the final electrical equipment in a house

Prerequisite(s): ELEC2502.

(2 C: 1 lect/pres, 1 lab, 0 other)

ELEC 2510 - National Electrical Code III

Students will gain a comprehensive knowledge of the National Electrical Code (NEC) in residential, commercial, and industrial situations. Areas to be covered, to include: wiring methods, raceways, lighting, grounding, bonding, motors, transformers, low voltage, calculations, hazardous locations, solar, wind generation, NFP 70E (OSHA STANDARD) and code changes.

Student Learning Outcomes:

- * Identify technical (NEC) language and vocabulary.
- * Develop reading comprehension skills.
- * Analyze safety aspects of the NEC and NFP 70E.
- * Develop test taking skills in preparation for NEC exam.
- * Develop NEC code skills through collaborative projects.
- * Demonstrate the ability to recognize low voltage systems.

Prerequisite(s): ELEC1515.

(2 C: 1 lect/pres, 1 lab, 0 other)

ELEC 2514 - National Electrical Code IV

Students will analyze advanced electrical concepts as they pertain to the National Electric Code (NEC) and the NFP 70E (OSHA STANDARD). Students will also develop skills required to take the State Electrical exam.

Student Learning Outcomes:

- * Apply NEC calculations.
- * Determine the safety aspects of the NEC and the NFP 70E.
- * Organize thought patterns by using the index and glossary of the NEC.
- * Use occupational specific technical vocabulary as defined in the NEC.
- * Perform calculations per NEC from Blueprint information.

Prerequisite(s): ELEC2510.

(2 C: 1 lect/pres, 1 lab, 0 other)

ELEC 2519 - Commercial Wiring

Students will read and interpret blueprints and develop procedures to follow in the installation of wiring and control systems used in commercial buildings; determine pipe fill, box fill, voltage drop, ampacities and de-rating of conductors; develop their pipe bending skills by lab projects in EMT with ½ inch and ¾ inch conduit. MC Cable and AC cable lab projects will enhance the students knowledge of other wiring installations for commercial wiring.

Student Learning Outcomes:

- * Bend conduit to industry standards.
- * Apply NEC de-rating factors to installations.
- * Recommend proper lighting solutions.
- * Interpret NEC for commercial applications.
- * Complete circuit construction projects.

Prerequisite(s): ELEC1506, ELEC1518.

(3 C: 1 lect/pres, 2 lab, 0 other)

ELEC 2520 - Commercial Lighting

The student will have the knowledge of commercial wiring, study incandescent, fluorescent, HID, and mercury vapor light fixtures, operation of troubleshooting and repair layout of systems and efficient usage.

Student Learning Outcomes:

- * Recommend proper lighting
- * Troubleshoot light problems
- * Interpret NEC code for lighting
- * Apply industry standard safety practices

Prerequisite(s): ELEC1506, ELEC1518.

(2 C: 0 lect/pres, 2 lab, 0 other)

ELEC 2522 - AC Motor Control I

Students will study the design, construction and operation of motors. This includes lab time on single phase, squirrel cage, synchronous, repulsion and shaded pole motors. Students will examine the basic design and construction of control equipment for single phase and three phase motors.

Student Learning Outcomes:

- * Participate as a member of a team during lab performance activities
- * Complete lab projects demonstrating appropriate safety practices
- * Analyze the basis of electro-magnets and the rotating magnetic field
- * Draw schematic diagrams of various motors
- * Describe the principles of operation of various motors
- * Identify customer relationships and needs

Corequisite(s): ELEC2538

Prerequisite(s): ELEC1526.

(3 C: 1 lect/pres, 2 lab, 0 other)

ELEC 2526 - A.C. Motor Control II

Students will complete their advancement in motor control with the ability to draw, read, and safely execute the wiring of a motor control circuit through the use of a complex motor control diagram. The students will also demonstrate the ability to troubleshoot electrical and mechanical problems that occur in motor control circuits.

Student Learning Outcomes:

- * Draw single phase and three phase motor control systems.
- * Install single phase and three phase motor control systems.
- * Troubleshoot single phase and three phase motor control systems.
- * Interpret complex motor control diagrams.

Prerequisite(s): ELEC2522.

(4 C: 1 lect/pres, 3 lab, 0 other)

ELEC 2532 - Solid State and PLC Controls

This course will enable students to analyze solid state devices and applications. Students will assemble solid state devices using diodes, rectifiers, filters, and transistors. The course will develop into basic PLC motor control situations. Students will write PLC logic, program, and wire PLCs.

Student Learning Outcomes:

- * Exhibit approved safety practice in all lab projects.
- * Analyze solid state devices.
- * Identify solid state device applications in industry.
- * Program various PLCs.
- * Outline operating procedure of PLCs.
- * Evaluate variable frequency driver controls and circuits.

Prerequisite(s): ELEC2522.

(3 C: 1 lect/pres, 2 lab, 0 other)

ELEC 2534 - Industrial Systems

This course will examine wiring practices associated with industrial plants and operations. Students will assemble industrial services, bend large conduit, learn conduit sizing, pull box sizing, use electric and hydraulic conduit benders, use electric wire pullers, use electric power threaders for rigid conduit and learn proper methods for pulling large quantities of conductors. The students will also analyze hazardous areas as defined in the NEC article 500, and interpret various job blueprints.

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Student Learning Outcomes:

- * Complete lab projects demonstrating appropriate safety practices.
- * Contrast electrical code and electrical safety requirements.
- * Develop electrical wiring strategies.
- * Select materials, tools and equipment for a job.
- * Assemble industrial electrical systems.
- * Operate industrial electrical equipment.
- * Perform all work in a professional manner.
- * Demonstrate professionalism and team performance attributes.
- * Examine diversity issues in the job environment.

Prerequisite(s): ELEC1502.

(3 C: 0 lect/pres, 3 lab, 0 other)

ELEC 2538 - Transformers, Three Phase Systems, and Formulas

Students will analyze the principles and theory of single and three phase transformers and apply that knowledge to a lab situation where they will construct working models of transformers and three phase systems. Students will also use complex trigonometric formulas to describe electrical principals.

Student Learning Outcomes:

- * Participate as a member of a team during lab performance activities
- * Complete lab projects demonstrating appropriate safety practices
- * Solve practical problems
- * Use Trig to solve electrical circuits
- * Analyze technical functions of a transformer
- * Solve 3 phase circuit problems

Prerequisite(s): ELEC1518, ELEC1526.

(3 C: 1 lect/pres, 2 lab, 0 other)

ELEC 2540 - Low Voltage Systems

This course will introduce students to low voltage/limited energy electrical circuits. These include, but are not limited to Telecommunications, Coax cable, networking, Class 2 and 3 circuits, fiber optic systems, security systems, and fire alarm systems. Students will learn proper cable installation and termination skills. Students will analyze problems and solutions to electromagnetic interference and other forms of electrical noise.

Student Learning Outcomes:

- * Identify computer networking devices
- * Demonstrate cable termination techniques
- * Evaluate fiber optic cable applications
- * Identify problems and cures of electromagnetic interference
- * Describe various coaxial and communication cable installations
- * Design a cabling architecture
- * Test and troubleshoot system problems
- * Wire a security and/or a fire alarm system

(1 C: 0 lect/pres, 1 lab, 0 other)

EMSC 1420 - AHA Heartsaver CPR and First Aid

This is a general First Aid and CPR course; it is intended for the lay public, as well as the trades and industry. This course will cover first aid care and treatment of adults and children, including CPR, shaken baby syndrome and sudden unexpected infant death (SUID/SIDS). This course is taught to the standards of the American Heart Association.

Student Learning Outcomes:

- * Describe how and when to access the EMS system
- * Perform CPR and Choking intervention for adults, children and infants according to the latest standards of the American Heart Association
- * Provide treatment for common injuries and illnesses, including strokes and myocardial infarctions
- * Apply proper personal protective equipment (PPE) at appropriate times

(1 C: 1 lect/pres, 0 lab, 0 other)

EMSC 1443 - EMT-1

This course is taught utilizing the 2010 EMS Education Standards and is approved by and taught to the standards of the Minnesota Emergency Medical Services Regulatory Board (EMSRB). This Department of Transportation (DOT) approved course will enable students to attain the knowledge to assess, treat, and transport patients who have a variety of illnesses and injuries.

Upon successful completion of EMT 1 students will be eligible to continue to

EMT 2 or they may elect to test out and become certified at the Emergency Medical Responder (EMR) level.

Student Learning Outcomes:

- * Identify the basic human anatomy and physiology
- * Describe how and when to access the EMS system.
- * Perform vital signs, oxygen therapy, and airway management.
- * Apply medical terminology commonly used by the EMT.
- * Assess different mechanisms of trauma and how they affect the body.
- * Formulate different pathophysiologies and which organ systems are affected.
- * Classify patient conditions based on disease process.
- * Conduct patient assessments on medical and trauma patients of all ages.
- * Describe the incidence of semi-automatic defibrillators (AED).
- * Demonstrate performance of CPR.

(3 C: 2 lect/pres, 1 lab, 0 other)

EMSC 1445 - EMT-2

This course is taught utilizing the 2010 EMS Education Standards and is approved by and taught to the standards of the Minnesota Emergency Medical Services Regulatory Board (EMSRB). This Department of Transportation (DOT) approved course will enable students to attain the knowledge to assess, treat, and transport patients who have a variety of illnesses and injuries.

Upon successful completion of EMT 1 students will be eligible to continue to EMT 2 or they may elect to test out and become certified at the Emergency Medical Responder (EMR) level.

Student Learning Outcomes:

- * Identify the basic human anatomy and physiology
- * Describe how and when to access the EMS system.
- * Perform vital signs, oxygen therapy, and airway management.
- * Apply medical terminology commonly used by the EMT.
- * Assess different mechanisms of trauma and how they affect the body.
- * Formulate different pathophysiologies and which organ systems are affected.
- * Classify patient conditions based on disease process.
- * Conduct patient assessments on medical and trauma patients of all ages.
- * Describe the incidence of semi-automatic defibrillators (AED).
- * Demonstrate performance of CPR.

Prerequisite(s): EMSC1443.

(6 C: 5 lect/pres, 1 lab, 0 other)

EMSC 1462 - Emergency Medical Responder (First Responder)

This National Highway and Transportation Safety Administration (NHTSA) course is designed to enable a person to have the fundamental knowledge base to perform as an entry level Emergency Medical Responder. This course is taught utilizing the 2010 EMS Education Standards and is approved by and taught to the standards of the Minnesota Emergency Medical Services Regulatory Board (EMSRB). The focus of this course is the recognition of, and emergency care of sick or injured people, utilizing basic EMS equipment and assisting Emergency Medical Technicians once they have arrived. Upon passing this course the student will be eligible to be registered with the Minnesota EMSRB as an Emergency Medical Responder. Emergency Medical Responder Certification is valid for two (2) years.

Student Learning Outcomes:

- * Describe how and when to access the EMS system.
- * Recognize and provide emergency care to sick persons.
- * Recognize and provide emergency care to injured persons.
- * Describe the need for and show proficiency in the use of semi-automatic defibrillators.
- * Demonstrate performance of CPR.
- * Articulate simple, appropriate care plans for a sick or injured person
- * Perform basic airway management and oxygen therapy skills

(3 C: 2 lect/pres, 1 lab, 0 other)

EMSC 1480 - AHA BLS for Healthcare Providers

This course is designed for healthcare providers. It will cover how to prevent heart attacks and stroke. The course focuses on how to perform CPR in the event that someone goes into respiratory arrest, cardiac arrest or is choking; this encompasses treatment for an adult, child and infant with both one and two rescuers. This course discusses integration with emergency medical services (EMS), infection control, barrier devices, breathing devices and semi automatic defibrillation.

Student Learning Outcomes:

- * Describe how and when to access the EMS system.
 - * Identify steps of prevention, recognition, risk factors, and possible treatment of stroke and Myocardial Infarctions (heart attacks).
 - * Perform CPR and choking intervention for adults, children and infants according to the latest standards of the American Heart Association.
 - * Demonstrate the use of the Automatic External Defibrillators (AED).
 - * Apply proper personal protective equipment (PPE) at appropriate times.
- (1 C: 1 lect/pres, 0 lab, 0 other)

EMSP 1401 - EMS Operations

This is an introductory course for the Paramedicine student reflective of the 2010 National Standards Curriculum. This course will enable the student to advance their knowledge base from the EMT education to the advanced role of the Paramedic in topics, such as, medical-legal issues, roles and responsibilities, communication, personal wellness, and emergency vehicle operations.

Student Learning Outcomes:

- * Identify roles and responsibilities for all levels of care within an EMS system.
- * Explain the value of personal well being, stress management and injury prevention in the healthcare environment.
- * Demonstrate effective communication with patients and other allied healthcare providers within legal and ethical boundaries.
- * Describe safety measures on the scene of an emergency with regard to themselves, other allied health professionals, the public, and the patient(s).
- * Apply safe emergency vehicle operation measures to the scene of an incident.
- * Implement safe operating procedures of an emergency vehicle.

(3 C: 3 lect/pres, 0 lab, 0 other)

EMSP 1402 - Paramedicine Skills I

This is an introductory skills course for the Paramedicine student reflective of the 1998 National Standards Curriculum. It will cover the core skills of the basic EMS provider and then expands to the advanced skills of the paramedic. Students will be enabled to apply fundamental skills in patient care to include I.V. therapy, basic and advanced airway management, advanced patient assessment/physical exam and others.

Student Learning Outcomes:

- * Demonstrate basic life support skills as required by the National Registry of Emergency Medical Technicians - Basic Practical Exam
- * Develop and refine basic and advanced skills needed to assess, manage and treat critically ill and injured patients in the out of hospital setting
- * Demonstrate proper dissemination of patient information in verbal and written form to and from allied health care providers

Prerequisite(s): HLTH1440, BLGY1320.

(3 C: 0 lect/pres, 3 lab, 0 other)

EMSP 1403 - Introduction to Pharmacology

Students learn pharmacological concepts, drug legislation and drug categories. Emphasis is placed on medical math and development of equations used in the calculation of medication administration.

Student Learning Outcomes:

- * Define the basics of pharmacology including, drug schedules, pharmacokinetics, pharmacodynamics and drug profiles.
- * Calculate formulas commonly used in medical math.

(1 C: 1 lect/pres, 0 lab, 0 other)

EMSP 1404 - Emergency Pharmacology for Paramedics

This course covers the pharmacology portion of the 2010 National Standard Paramedic Curriculum. Students learn pharmacological concepts, drug legislation and drug categories. Emphasis is placed on commonly used drugs in the emergency setting and their effects on body systems. This course will also provide the student with a basic understanding of pharmacology necessary for safe drug administration.

Student Learning Outcomes:

- * Categorize the indications, contraindications, dosage, routes of administration, precautions and side effects of various medications used in the emergency setting.
- * Synthesize the basics of pharmacology to each medication used in the pre-hospital setting.
- * Formulate the dose and volume of each medication to administer in a given scenario.

- * Contrast the appropriate medication for the corresponding patient condition.

Prerequisite(s): EMSP1403.

(2 C: 2 lect/pres, 0 lab, 0 other)

EMSP 1405 - Medical Emergencies

Topics covered are Hematology, OB/GYN, Toxicology, Gastroenterology, Neurology, Endocrinology and others. Emphasis is placed on understanding pathology and how it relates to specific medical emergencies. Students also learn to put it all together and practice assessment, management and treatment of various medical and traumatic emergencies in scenario based learning.

Student Learning Outcomes:

- * Perform an assessment on the critically ill or injured patient in a scenario based setting.
- * Integrate pathophysiological principles with assessment findings.
- * Formulate a field impression for the patient with a medical or traumatic emergency.
- * Implement a treatment plan for the pre-hospital patient.
- * Describe pathophysiological principles used to assess, manage and treat various types of medical emergencies to include OB/GYN, Neonatal, geriatric, psychiatric, and chronic care patients.
- * Explain the etiology of various types of medical emergencies with respect to acute illness or disease.

Prerequisite(s): HLTH1440, BLGY1320.

(3 C: 0 lect/pres, 1.5 lab, 1.5 other)

EMSP 1407 - Cardiology I

Emphasis is placed on electrophysiology and pathophysiological principals. Students will learn to identify components on the ECG and measurement standards for cardiology.

Student Learning Outcomes:

- * Explain the electrophysiology of the heart.
- * Describe the anatomy and physiology of the cardiovascular system.
- * Identify components of the ECG.
- * Utilize standards to interpret various rhythms.

(2 C: 2 lect/pres, 0 lab, 0 other)

EMSP 1409 - Paramedicine Skills II

This course is the skills component of EMSP1410 and EMSP1404, reflective of the 2010 National Standard Paramedic Curriculum. It will continue to enhance and refine the skills learned in EMSP1402. Fundamental skills of critical cardiac and respiratory related emergencies will be enhanced. More advanced techniques and skills such as rapid sequence intubation, 12-lead application and interpretation, thoracentesis and surgical airways will be explored. Emphasis is placed on scenario-based learning.

Student Learning Outcomes:

- * Perform a complete patient history and physical exam.
- * Formulate a field diagnosis and implement a treatment plan for various patient presentations, to include the use of medications and other advanced level skills.
- * Manage a traumatic, respiratory and cardiac emergency, including cardiac arrest for patients of all ages.
- * Employ advanced invasive procedures when needed to manage a patients airway, cardiovascular and hemodynamic status.

Prerequisite(s): EMSP1406, EMSP1404, EMSP1410.

(2 C: 0 lect/pres, 2 lab, 0 other)

EMSP 1410 - Cardiology II

This course will cover the Pulmonary and Cardiology portion of module five of the 2010 National Standard Paramedic curriculum. Emphasis is placed on pathophysiological principles and assessment findings for the student to formulate a field impression and implement a treatment plan for a patient with a respiratory or cardiovascular emergency. Students will learn to interpret cardiac rhythms on the ECG.

Student Learning Outcomes:

- * Formulate a field impression for the patient with respiratory problems.
- * Formulate a field impression for the patient with cardiovascular disease.
- * Interpret cardiac arrhythmias.
- * Explain the basics of cardiology including electrophysiology, anatomy, and physiology.

- * Evaluate components of the ECG.
- * Incorporate the standards used in interpretation of cardiac arrhythmias.
- * Establish a treatment plan for the respiratory patient.
- * Implement a treatment plan for cardiac arrhythmias.

Corequisite(s): EMSP1404

Prerequisite(s): EMSP1407.

(4 C: 3 lect/pres, 1 lab, 0 other)

EMSP 1432 - Support Services Internship

This course is designed to allow the Paramedicine student to refine basic and advanced airway management skills and knowledge along with IV therapy techniques in a clinical setting. Opportunity is also afforded to allow students to develop an understanding of care given in a critical care setting. The student utilizes all of the knowledge and skills learned to this point to provide and assist in patient care in this setting under the direct supervision of an Anesthesiologist, Registered Nurse or both.

Student Learning Outcomes:

- * Provide basic and advanced airway management skills and techniques to a variety of patients of all ages.
- * Perform venipuncture and IV therapy on a variety of patients of all ages.
- * Demonstrate a history and physical exam.
- * Discuss procedures and equipment used to care for the critical care patient.

Prerequisite(s): EMSP1402. (2 C: 0 lect/pres, 0 lab, 2 other)

EMSP 1441 - ALS Ambulance Internship

This course is designed to introduce the student to an Advanced Life Support (ALS) ambulance service. The student will become familiar with the operations, procedures and care provided by the Paramedic in the field. The student will be involved with Basic Life Support (BLS) and ALS patient care, treatment and transport under the direct supervision of a staff Paramedic.

Student Learning Outcomes:

- * Explain the roles and responsibilities of a Paramedic within an EMS system.
- * Establish and/or maintain a patent airway, oxygenate, and ventilate.
- * Perform a comprehensive physical exam, including a complete history on any patient
- * Communicate patient findings to the patient and allied health professionals.
- * Demonstrate a treatment plan for the medical and trauma patient of all ages.

Prerequisite(s): EMSP1410.

(2 C: 0 lect/pres, 0 lab, 2 other)

EMSP 2412 - Paramedicine Skills III

This course provides fundamental skills related to critical medical emergencies will be enhanced and applied in treatment of patients with a variety of etiologies and presentations. Emphasis is placed on team-based approach in simulation and scenario-based learning.

Student Learning Outcomes:

- * Performs a comprehensive patient assessment.
- * Formulates a field diagnosis, and implements a treatment plan for various patient presentations, to include the use of medications and other advanced level skills.
- * Maintains overall patient perspective through coordination of treatment and transportation.
- * Demonstrates leadership to the team by designating tasks.
- * Utilizes advanced procedures when appropriate to manage special population patients, including neonate, pediatric, geriatric, and chronic condition patients.

Corequisite(s): EMSP2410

Prerequisite(s): EMSP1406, EMSP1404, EMSP1410.

(2 C: 0 lect/pres, 2 lab, 0 other)

EMSP 2420 - Specialized Populations

This course is designed to address the needs of specialized populations, including pediatric, geriatric and OB patients, in our communities. It will continue to enhance and refine the skills previously learned. Fundamental skills of critical cardiac and respiratory related emergencies will be enhanced. This course will incorporate standard certification courses as specified by the industry. Emphasis is placed on scenario-based learning.

Student Learning Outcomes:

- * Perform a complete patient history and physical exam.

- * Formulate a field diagnosis and implement a treatment plan for various patient presentations, to include the use of medications and other advanced level skills.
- * Manage a traumatic, respiratory and cardiac emergency, including cardiac arrest for patients of the extreme age categories.

- * Employ advanced invasive procedures when needed to manage a patient's airway, cardiovascular and hemodynamic status; while adhering to American Heart Association standards.

- * Demonstrate pediatric cardiac arrest management.

- * Perform an intraosseous cannulation and infusion.

- * Identify developmental characteristics of infants and children of varying age groups.

- * Apply principles of injury prevention to case studies.

- * Differentiate between respiratory distress, failure, and arrest.

- * Distinguish different forms of shock and identify compensated and decompensated states.

Prerequisite(s): EMSP1404, EMSP1410. (2 C: 1 lect/pres, 1 lab, 0 other)

EMSP 2425 - Advanced Trauma Care

This course covers areas such as kinematics, various injury pathologies and mechanisms, and trauma patient management priorities. This course addresses treatment standards as they relate to the state trauma system.

Student Learning Outcomes:

- * Differentiate the kinematics of trauma as they pertain to mechanism of injury (MOI).

- * Establish and/or maintain a patent airway, oxygenate, and ventilate.

- * Perform a comprehensive physical exam, including a complete history on any patient.

- * Integrate a treatment plan for the trauma patient.

- * Perform invasive procedures as they relate to the trauma patient (e.g. chest decompression, pericardiocentesis, surgical airways, tourniquets, etc)

Prerequisite(s): EMSP1410.

(2 C: 1 lect/pres, 1 lab, 0 other)

EMSP 2430 - ALS Ambulance Internship II

This course is designed to introduce the student to an Advanced Life Support ambulance service. The student will become familiar with the operations, procedures and care provided by the Paramedic in the field. The student will be involved with BLS and ALS patient care, treatment and transport under the direct supervision of a staff Paramedic.

Student Learning Outcomes:

- * Establish and/or maintain a patent airway, oxygenate, and ventilate.

- * Summarize the results of a comprehensive physical exam, including a complete history, on any patient.

- * Contrast the diagnoses of the patient and communicate them with an allied health professional.

- * Compare treatment plans for the trauma and medical patients of all ages.

Prerequisite(s): EMSP1441.

(2 C: 0 lect/pres, 0 lab, 2 other)

EMSP 2435 - Critical Care Internship

This course covers the various support services and ancillary areas in a clinical setting that affect what a Paramedic does in the field. The student utilizes all of the knowledge and skills learned to this point to provide and assist in patient care in this setting under the direct supervision of a Registered Nurse and/or Physician.

Student Learning Outcomes:

- * Demonstrate an understanding for invasive interventional cardiology and how this applies to patients who are treated using these various methods.

- * Correlate various heart dysrhythmias to disease pathology and cardiac output.

- * Utilize all skills and knowledge acquired to this point to determine pathology of various illness and injuries.

- * Perform history and physical exam and utilize skills within the Paramedics scope of practice to assist in caring for patients of all ages with a variety of illness and injuries.

Prerequisite(s): EMSP1406, EMSP1404, EMSP1410.

(2 C: 0 lect/pres, 0 lab, 2 other)

EMSP 2438 - Emergency Department Internship

This course covers the operations of the Emergency Department of a Level I

or Level II trauma center. The student utilizes all of the knowledge and skills learned to this point to provide and assist in patient care in this setting under the direct supervision of a registered Nurse and/or Physician.

Student Learning Outcomes:

- * Establish and maintain a patent airway.
 - * Provide adequate oxygenation and ventilation for the patient.
 - * Identify the pertinent patient history.
 - * Perform a comprehensive physical exam on any patient.
 - * Communicate patient findings to the patient and other allied health professionals.
 - * Implement the treatment plan for the trauma patient.
 - * Formulate a field Impression for the medical and trauma patient of all age groups.
 - * Implement the treatment plan for chronically ill patients of all ages.
- Prerequisite(s): EMSP1406, EMSP1404, EMSP1410.
(3 C: 0 lect/pres, 0 lab, 3 other)

EMSP 2442 - Acute Care Internship

This course provides clinical rotation through labor and delivery, pediatrics and psychiatry. The student utilizes all of the knowledge and skills learned to this point to provide and assist in patient care in this setting under the supervision of appropriate staff.

Student Learning Outcomes:

- * Apply the general concepts of pathophysiology for the assessment and management of emergency patients.
 - * Integrate the principles of therapeutic communication to effectively communicate with any patient while providing care.
 - * Apply a process of clinical decision making to use the assessment findings to help form a field impression.
 - * Effectively document the essential elements of patient assessment, care and transport.
 - * Describe and demonstrate safe, empathetic competence in caring for patients with behavioral emergencies.
 - * Explain the anatomy and physiology of the female reproductive system to the assessment and management of a patient experiencing normal or abnormal labor.
 - * Integrate pathophysiological principles and assessment findings to formulate a field impression and implement the treatment plan for the neonatal patient.
 - * Integrate pathophysiological principles and assessment findings to formulate a field impression and implement the treatment plan for the pediatric patient.
- Prerequisite(s): EMSP2412.
(2 C: 0 lect/pres, 0 lab, 2 other)

EMSP 2460 - ACLS Provider

This course will result in the awarding of Advanced Cardiac Life Support Provider certification from the American Heart Association. It will cover all aspects of treating cardiac and stroke patients at the advanced level to include basic and advanced airway management, cardiac rhythm interpretation, medication administration and post resuscitation management.

Student Learning Outcomes:

- * Perform post resuscitation care
 - * Perform as a team member and team leader
 - * Perform vascular access
 - * Perform I.V. and ETT medication administration
 - * Identify and treat various cardiac dysrhythmias
 - * Demonstrate adult cardiac arrest management
 - * Describe special arrest situations
 - * Perform defibrillation, cardioversion and TCP
 - * Describe and perform initial resuscitation steps
 - * Identify ACLS purpose
 - * Perform basic and advanced airway management
 - * Demonstrate an understanding of various types of medication used in ACLS
- Prerequisite(s): EMSP1406, EMSP1408 or ICVT2446.
(1 C: 1 lect/pres, 0 lab, 0 other)

EMSP 2462 - ITLS Provider Course

This course will award certification as a Pre-Hospital Trauma Life Support Provider at the Advanced level. This course covers areas such as Kinematics, various injury pathologies and mechanisms and trauma patient management priorities.

Student Learning Outcomes:

- * Outline pregnant patient trauma considerations
 - * Perform in-line intubation
 - * Describe body cavity trauma
 - * Describe head, neck and spine trauma
 - * Describe thermal trauma
 - * Describe extremity trauma
 - * Perform traumatic airway management
 - * Perform trauma patient assessment
 - * Describe general patient trauma
 - * Perform trauma I.V. therapy
 - * Identify trauma patient priorities
 - * Perform trauma patient management
 - * Perform trauma patient care
 - * Differentiate Kinematics
 - * Perform initial resuscitation steps
 - * Describe burn trauma
- Prerequisite(s): EMSP1406, EMSP1408
(1 C: 1 lect/pres, 0 lab, 0 other)

EMSP 2468 - PALS Provider Course

This course will result in the awarding of Pediatric Advanced Life Support Provider certification from the American Heart Association. It will cover all aspects of treating pediatric respiratory and cardiac patients at the advanced level to include basic and advanced airway management, cardiac rhythm interpretation, medication and fluid administration, intraosseous cannulation and post resuscitation management.

Student Learning Outcomes:

- * Perform post resuscitation care
 - * Perform as a team member and team leader
 - * Perform vascular and intraosseous cannulation
 - * Perform I.V., I.O. and ETT medication administration
 - * Identify and treat various cardiac dysrhythmias
 - * Demonstrate pediatric cardiac arrest management
 - * Describe special arrest situations
 - * Perform defibrillation, cardioversion and TCP
 - * Describe and perform initial resuscitation steps
 - * Identify PALS purpose
 - * Perform basic and advanced airway management
- Prerequisite(s): EMSP1406, EMSP1408
(1 C: 1 lect/pres, 0 lab, 0 other)

EMSP 2472 - PEPP Provider

Pediatric Education for Prehospital Professionals is a 13-hour two day course designed for any allied health professional who is responsible for the emergent care of children. This course has skill stations for ALS and BLS providers concurrently and emphasis is placed towards caregivers that practice in the out-of-hospital setting. Topics include Pediatric Assessment, Respiratory, Medical and Traumatic Emergencies, Children with Special Needs, Child Maltreatment, Emergency Delivery and Newborn Stabilization and others.

Student Learning Outcomes:

- * Identify developmental characteristics of infants, children of different age groups
- * Perform pediatric assessment using the pediatric assessment triangle (PAT)
- * Apply principals of injury prevention to case studies
- * Differentiate between respiratory distress, respiratory failure and respiratory arrest
- * Perform a treatment strategy from the least to the most invasive, for children with respiratory compromise
- * Differentiate between compensated and decompensated hypovolemic shock
- * Perform the steps in the management of cardiopulmonary arrest
- * Describe the common causes of altered level of consciousness in infants and children and outline management
- * Perform appropriate assessment and treatment techniques to case studies presenting patients with seizures and other medical emergencies
- * Perform assessment and treatment of pediatric burn patients
- * Describe how to prepare for delivery, perform a delivery and go to postdelivery care
- * Apply assessment techniques and treatment plans to case studies presenting a

newborn in distress

* Describe the complications of tracheostomy tubes, central venous lines, gastrostomy tubes or gastric feeding tubes and ventriculoperitoneal shunts and outline management

(1 C: 1 lect/pres, 0 lab, 0 other)

EMSP 2481 - Paramedicine Internship

This course covers the application of advanced level skills and knowledge in the evaluation and care of the sick and injured patient. The student will be involved in practicing the art and science of out-of-hospital medicine as a team member and a team leader under the direct supervision of a staff paramedic.

Student Learning Outcomes:

- * Synthesize the pathophysiology of disease and trauma into patient findings.
- * Compose a differential diagnosis for each patient.
- * Defend the differential diagnosis for each patient.
- * Summarize ambulance operations and standard operating procedures.
- * Contrast out of hospital treatments as a team member and team leader for a variety of patient presentations in accordance with the U.S. D.O.T. National Paramedic Curriculum and local protocol.
- * Formulate a treatment plan based on patient presentation and disease or injury pathophysiology.
- * Evaluate the rationale for the treatments rendered and how the treatments alter disease or injury.
- * Explain Primary Injury Prevention methods.
- * Describe the role of a Paramedic within an EMS system and the community.
- * Anticipate patients needs based on condition of patient.
- * Predict the outcome of the patient based on findings.
- * Justify transport decision based on patient condition.

Prerequisite(s): EMSP2412. (6 C: 0 lect/pres, 0 lab, 6 other)

EMSP 2485 - Paramedicine Skills IV

This course is a technical course available for second year Paramedicine students in their last semester. The course will enhance the students level of competency in advanced life support skills and their preparedness to enter the workforce as an entry-level paramedic.

Student Learning Outcomes:

- * Synthesize skills used to manage a scene of a medical or traumatic emergency.
- * Implement a treatment plan for medical and trauma patients.
- * Justify the treatment plan developed for various scenarios.
- * Compose a differential diagnosis for disease pathologies when presented.
- * Incorporate the skills as outlined by the National Registry of EMT at the Paramedic level.

Prerequisite(s): EMSP2412.

(2 C: 0 lect/pres, 2 lab, 0 other)

ENGL 0900 - Writing Fundamentals

This composition course emphasizes foundational principles of writing, including focus, development, organization, clarity, unity, and coherence in paragraphs and brief essays. Students will practice how to generate documents that are understandable for audiences, including how to identify and correct common errors. Emphasis will be placed on increasing written fluency and responding to texts. By the end of the semester, students will have written 4500 words of revised work. This is a college readiness course and does not fulfill college writing requirements.

Student Learning Outcomes:

- * Write unified, coherent and well developed short essays including but not limited to description, narration, exposition and persuasion.
- * Develop controlling ideas with specific and relevant examples and details.
- * Organize ideas, anticipating audience expectation.
- * Apply editing control as a result of peer and instructor feedback.
- * Demonstrate general digital literacy appropriate for college courses using Word files and online learning platforms like D2L Brightspace.
- * Select appropriate topics for academic/professional writing.
- * Identify characteristics of diverse audiences.
- * Respond effectively to various published sources.

(3 C: 3 lect/pres, 0 lab, 0 other)

ENGL 1100 - Writing for the Workplace

This is a writing intensive course which builds essential written communica-

tion skills for the workplace. Through extensive practice, students will develop writing skills necessary for success in professional and academic environments. Students will apply professional English usage to a variety of written communications, such as memos, letters, applications, documentation, proposals, and reports. This course will also prepare them for today's complex workplace by focusing on appropriate tone and style for a diverse audience.

Student Learning Outcomes:

- * Utilize correct spelling, punctuation, grammar and sentence structure.
- * Apply professionalism in all workplace communication.
- * Analyze written material for purpose, organization, tone and point of view.
- * Employ diverse forms of workplace correspondence.
- * Identify audience needs and expectations.
- * Write clearly and coherently.
- * Practice the writing process by producing a variety of communications.
- * Apply critical thinking skills to writing, and communication issues.

Prerequisite(s): ENGL0900 and READ 0900 or Appropriate Placement Score. (3 C: 3 lect/pres, 0 lab, 0 other)

ENGL 1302 - Analytical Writing

Meets MN Transfer Goal 1 - Written Communication. This course focuses on research and argument, emphasizing contemporary issues. The course develops the writing, research, analytical, and peer evaluation skills necessary to succeed academically, professionally and personally. Students will produce for grading at least 6,500 words during the semester, including an extensive research paper. This course can be used in place of ENGL 1100 - Writing for the Workplace".

Student Learning Outcomes:

- * Demonstrate the writing process through invention, organization, drafting, revision, editing and presentation
- * Participate effectively in groups with emphasis on listening, critical and reflective thinking, and responding
- * Locate, analyze, evaluate, and synthesize in a responsible manner material from diverse sources and points of view
- * Select appropriate communication choices for specific audiences
- * Construct logical and coherent argument
- * Use authority, point of view, and individual voice and style in writing
- * Employ syntax and usage appropriate to academic disciplines and the professional world

Prerequisite(s): Appropriate Placement Score .

(4 C: 4 lect/pres, 0 lab, 0 other)

ENGL 1303 - Technical Writing

Meets MN Transfer Goal 1 - Written Communication. This transferable course will teach students to write effectively for the business world. They will learn how to research, write, and design appealing and productive print and electronic documents. Assignments will parallel the writing demands students will face both in college and in the workplace and may include e-mails, memos, reports, graphics, instructions, proposals, collaborative writing, and descriptions.

Student Learning Outcomes:

- * Create professional writing, reports, memos, instruction manuals, graphics, marketing materials, formal proposals, and more
- * Generate professional information products that address audience needs and that accomplish the writer's objectives
- * Apply strategies for successful collaboration, such as working and communicating on-line with colleagues, setting and achieving project goals, and responding constructively to peers' work
- * Locate, apply, and document research ethically
- * demonstrate proper grammar and mechanics

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.

(3 C: 3 lect/pres, 0 lab, 0 other)

ENGL 1308 - Stretch Analytical Writing I

Meets MN Transfer Curriculum Goal Area 1 - Written Communication. This is an introductory course in college-level composition, and develops written communication skills appropriate for academic and professional settings. This course emphasizes analytical reading, writing processes, composition skills, and critical analysis. Students will produce for grading at least 5,000 words during the semester. This three-credit course is intended for students who score a 62-78 on the Accuplacer and is not intended to replace the four-credit English 1302: Analytical Writing. To fulfill the Goal Area One requirement of the Minnesota Transfer Cur-

riculum or the Associate of Arts degree, students who take this course must also complete ENGL 1309: Stretch Analytical Writing II.

Student Learning Outcomes:

- * Demonstrate the writing process through invention, organization, drafting, revision, editing, and presentation.
- * Select appropriate communication choices for specific audiences.
- * Apply critical reading, writing and thinking skills to construct logical and coherent analysis of academic source material.
- * Synthesize source material including summaries, paraphrases and quotations into original student texts.
- * Analyze documentation in published research writing uncovering paths to original sources.
- * Participate effectively in peer reviews, reading actively and responding conscientiously.

Prerequisite(s): ENGL0900, READ0900 or Appropriate Placement Score
(3 C: 3 lect/pres, 0 lab, 0 other)

ENGL 1309 - Stretch Analytical Writing II

Meets MN Transfer Curriculum Goal Area 1 - Written Communication. This course emphasizes analysis, research, and argumentation in writing while building on written communication skills developed through previous college coursework. Students will produce for grading at least 5,000 words during the semester, including a well-developed research paper. This course is not an advanced research class and is instead intended for students who have completed English 1308 or an equivalent course accepted in transfer.

Student Learning Outcomes:

- * Demonstrate the writing process as it relates to academic writing.
- * Apply research methods to academic writing.
- * Analyze and synthesize primary and secondary source information from diverse perspectives.
- * Document sources using standard format and citation style.
- * Analyze and construct logical, coherent, comprehensive, and well-supported claims and arguments.
- * Demonstrate critical thinking skills in communication choices for specific audiences.
- * Participate effectively in groups with emphasis on active listening/observation, critical and reflective thinking, and conscientious responding.

Prerequisite(s): ENGL1308 and READ1112

(3 C: 3 lect/pres, 0 lab, 0 other)

ENGL 1321 - Introduction to Modern Fiction

Meets MN Transfer Curriculum Goal Area 6 and 8 - Humanities, Global Perspective. This course introduces students to the pleasure of reading by focusing on American and global novels published after 1965. Students will analyze and interpret modern literature from diverse authors, genres, and cultural contexts with attention paid to self- and global awareness. Through interaction with various novels, students will engage and formulate theories about fundamental human experiences. Tools for reading and writing critically will be emphasized.

Student Learning Outcomes:

- * Critically read representative works of modern fiction from American and global authors.
- * Analyze and appreciate representative works of modern fiction from around the world.
- * Examine the impact of diversity on the themes of modern fiction.
- * Apply the human universals expressed in novels from around the world to formulate a comparative perspective of cross-cultural social, economic and political experiences.
- * Recognize and use novel and literary analysis terminology.
- * Explore literary elements used in novels as social commentary.
- * Apply perspective gained from literature to personal and global situations.
- * Evaluate various interpretations of a text and their validity.
- * Analyze the support/evidence for a particular interpretation.
- * Conduct research to find materials appropriate to use for literary analysis.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

ENGL 1322 - Introduction to Literature

Meets MN Transfer Goal 6 - Humanities. An introduction to the study of creative literature in order to engage in critical analysis, form aesthetic judgments and

develop an appreciation of literature as essential to the survival and enrichment of society.

Student Learning Outcomes:

- * Explore the scope and variety of creative literature
- * Examine literature and expressions of individual and human values within an historical and social context
- * Develop an informed personal response to literature
- * Analyze the relationship between literature and society
- * Analyze literature from various literary viewpoints
- * Apply critical thinking skills to achieve clarity, reading, speaking, writing, and listening

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

ENGL 1340 - Introduction to Multicultural Literature

Meets MN Transfer Curriculum Goal Areas 6 and 7 - Humanities and Human Diversity. Multicultural literature features works written by African American, Asian American, Native American, and Latino authors as they intersect with issues of race, gender, class, ethnicity, religion, sexuality, and nationality. Students will read, discuss, and analyze multicultural literature to expand and deepen their experiences with diverse voices and perspectives. This will increase students' understanding of traditions and values of varied cultures necessary for living and working effectively in a society with great population diversity.

Student Learning Outcomes:

- * Define and apply literary terms in culturally relevant reading selections.
- * Define and apply glossary terms related to the study of culture.
- * Uncover and interpret cultural similarities and distinctions via literature.
- * Examine culturally relevant literary themes and issues rooted in social structures and values.
- * Analyze cultural issues in literature as expressions of individual and human values within historical periods.
- * Apply critical thinking to achieve clarity, accuracy, precision, depth, and fair-mindedness to reading, discussing, writing, and listening skills to the culture-based study of literature.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

ENGL 1341 - Introduction to Women's Literature

Meets MN Transfer Goal 6 - Humanities. This course introduces students to the history, language and culture of women's literature. In this course, students will gain an understanding of women's lives from the past and in the present in relationship to themselves, their children and their male counterparts.

Student Learning Outcomes:

- * Explore the scope and variety of women's literature
- * Examine women's literature in relationship to the values, culture and artistic expressions of society
- * Develop an informed personal response to women's literature
- * Examine women's literature as expressions of literature
- * Examine women's literature as expressions of humanity's and women's values within a historical period
- * Apply critical thinking skills to achieve clarity, accuracy, precision, depth and fair-mindedness to reading, speaking, writing and listening skills

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

ENGL 1342 - Middle Eastern Literature

Meets MN Transfer Goals 6 and 8 - Humanities and Global Perspective. This course attempts to reflect a growing academic interest in the Middle East and its distinguished literary tradition in context of historical, social, and cultural structures and values in Literature. Novels, short stories, and poetry from Arab, Jewish, and Persian backgrounds are covered.

Student Learning Outcomes:

- * Define Middle Eastern Literature
- * Recognize cultural distinctions
- * Differentiate types of Middle Eastern Literature
- * Identify different themes within the Middle Eastern Literature
- * Relate themes of Middle Eastern Literature to culture and tradition
- * Apply critical thinking skills to achieve clarity, accuracy, precision, depth, and fair-mindedness to reading, writing, speaking, and listening skills

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

- * Analyze Middle Eastern Literature in relationship to the values, cultural and artistic expressions of society
- * Examine the relationship of spirituality in the culture as expressions of literature
- * Interpret presented cultural, social, spiritual issues and ideas in relation to one's own experiences
- * Analyze literature about cultural issues in relationship to the values, culture, and artistic expressions of society

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

ENGL 1345 - Gender in Literature

Meets MN Transfer Curriculum Goal Areas 6 and 7 - Humanities and Human Diversity. This course explores the portrayal of gender roles (experience and perspectives), gender identity, and sexual identity/orientation in context of historical, social, and cultural structures and values in literature. Students will read, discuss, and analyze literature to expand and deepen their experiences with issues related to gender. Students will apply critical thinking skills to the gender-based study of literature.

Student Learning Outcomes:

- * Define and apply literary and gender-related glossary terms.
- * Identify and examine gender themes and issues within literature to build knowledge of culture and tradition.
- * Interpret presented gender issues and ideas in relation to one's own experiences.
- * Examine gender themes and issues in context of social structures and values.
- * Analyze gender issues in literature as expressions of individual and human values within historical periods.
- * Examine gender issues as expressions in literature.
- * Analyze gender issues in literature as they relate to the values, culture, and artistic expressions of society.
- * Apply critical thinking skills to achieve clarity, accuracy, precision, depth, and fair-mindedness to reading, discussing, writing, and listening to the gender-based study of literature.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

ENGL 2310 - Introduction to Creative Writing

Meets MN Transfer Curriculum Goal Areas 1 and 6 - Written Communication and Humanities. Students will learn the principles and methods of basic creative writing for poetry, fiction, and creative nonfiction with a focus on developing the creative process. Through a variety of methods, students will deepen their appreciation for and ability to produce creative writing. Students will develop the ability to express themselves through poetry, fiction, and creative nonfiction as well as an appreciation for creative works of the past and present, resulting in a creative writing portfolio.

Student Learning Outcomes:

- * Critique short fiction, creative nonfiction, and poetry of past and present.
- * Implement a variety of creative writing methods, including developing voice, creating imagery, and crafting character, setting, and structure.
- * Analyze the connections between personal experience and creativity
- * Create and edit poems, short works of fiction and creative nonfiction.
- * Develop creative thought and expression through writing poetry, fiction, and nonfiction.
- * Demonstrate the writing process through invention, organization, drafting, revision, editing and presentation.
- * Participate effectively in writers' workshops with emphasis on listening, critical and reflective thinking, and responding.

Prerequisite(s): ENGL1302.
(3 C: 3 lect/pres, 0 lab, 0 other)

ENGR 1500 - Introduction to Engineering

This course provides comprehensive information about diverse engineering disciplines, and roles, responsibilities, required skills, and aptitudes of engineers of diverse disciplines. This course provides exposure to the engineering profession through the incorporation of the imperative skills - networking with other students and professionals, teamwork, engineering design, computer skills, ethical decision-making, time management, and communicating to diverse audiences. Students are introduced to engineering fundamentals through group projects and learn teamwork skills necessary for success in academics and as modern profes-

sional engineers. Engineers representing diverse disciplines will also present to students on their specific branch of engineering.

Student Learning Outcomes:

- * Compare the diverse engineering disciplines based on research and class activities.
- * Summarize codes of ethics and responsibilities of professional engineers.
- * Identify basic software used by engineers.
- * Create group design projects explaining the tasks performed to achieve design objective
- * Explain engineering design processes.

Prerequisite(s): MATH1300.
(2 C: 2 lect/pres, 0 lab, 0 other)

ENGR 2500 - Statics

This course will cover advanced statics and physics concepts through the use of calculus and other math skills. It will introduce static force calculations as they are applied to specific rigid bodies. It will also introduce the key concepts of friction, equilibrium, centroids, and center of gravity of structures.

Student Learning Outcomes:

- * Examine various theoretical and practical concepts of statics used by engineers, physicists, and other scientific professionals.
- * Perform calculations using vectors to solve various mechanics problems.
- * Determine centroids of 2D and 3D shapes.
- * Design free-body diagrams for members of multi-body structures.
- * Analyze joint reaction loads for multi-body structures.
- * Solve internal loads in beams and cables.
- * Determine friction effects on structures.
- * Examine the principle of virtual work.
- * Communicate how statics theory draws conclusions about everyday real-world situations.

Prerequisite(s): MATH2310, PHYS2310.

(3 C: 3 lect/pres, 0 lab, 0 other)

ENGR 2505 - Dynamics

This course will cover advanced dynamics and physics concepts through the use of calculus and other math skills. It will introduce key concepts of kinematics and kinetics of particles, systems of particles and rigid bodies. It will also introduce the key concepts of work, energy, linear and angular impulse momentum, motion, and vibrations.

Student Learning Outcomes:

- * Examine various theoretical and practical concepts of dynamics used by engineers, physicists, and other scientific professionals.
- * Evaluate kinematic calculations for particles and rigid bodies in 3D, in inertial and non-inertial reference frames.
- * Solve kinematic calculations for particles and rigid bodies in 2D.
- * Identify the fundamental differences between 2D and 3D kinetics.
- * Analyze plane motion and curvilinear motion equations.
- * Compare work and energy.
- * Describe translation and rotation.
- * Perform mechanical vibration calculations.
- * Communicate how dynamics theory draws conclusions about everyday real-world concepts.

Prerequisite(s): ENGR2500.

(3 C: 3 lect/pres, 0 lab, 0 other)

ENVR 1305 - Environmental Science

Meets MN Transfer Goals 3 and 10 - Natural Sciences and People and the Environment. This course in environmental science studies the impact of humankind's activities on the planet. Class discussion and interaction will be encouraged. The problems and issues which the course will be dealing with are difficult and complex. The instructor promises no easy answers to these challenges.

Student Learning Outcomes:

- * Understand how human impacts on earth have changed through history and why environmental concerns have recently become so prominent
- * Recognize the major environmental challenges facing modern societies and understand the choices and trade-offs these challenges pose
- * Grasp the scientific principles underlying the basic phenomena of environmental change
- * Understand the technologies associated with major environmental problems and

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the technologies that may help solve these problems

- * Distinguish the environmental impacts of industrial and developing societies, and understand why different types of societies perceive different problems and pursue different solutions
 - * Broaden your familiarity with world geography and international affairs
 - * Understand how the issues discussed in the course are connected to the decisions and choices you make in your personal life
 - * Appreciate that the complexities and intricacies of environmental problems demand a holistic approach, manifested by team work and group communication
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(4 C: 3 lect/pres, 1 lab, 0 other)

ENVR 1310 - Environmental Issues

Meets MN Transfer Goals 3 and 10 - Natural Sciences and People and the Environment. This is an introductory course in Environmental Issues. The course reviews the fundamentals of environmental science and the concept of sustainability, stressing the problems of unsustainable use of natural resources and the devaluing earth's life support systems. The class emphasizes a sustainability approach to identify solutions that incorporate positive actions, beginning with individuals and then incorporating approaches from countries and regions. Perspectives on a variety of local, regional, and national environmental issues are addressed, while also emphasizing comprehensive coverage of worldwide resource and environmental issues. During the face-to-face meetings, the students will individually and collectively engage in field and laboratory research projects and address selected environmental topics through debates, presentations, and critical thinking evaluations. The students will be evaluating viewpoints from individuals, debating the hot topic environmental challenges of the day, as well as weighing the complexities of environmental issues.

Student Learning Outcomes:

Goal Area 3:

- * Synthesize and evaluate information and data sets that form the basis of scientific theory
- * Demonstrate mathematical and scientific reasoning abilities while engaging in research and critical thinking activities
- * Communicate effectively in interpersonal and group presentations settings
- * Demonstrate an appreciation of human and ecosystem diversity and be able to adopt and practice an environmental stewardship ethic
- * Conduct scientific research
- * Collect, record, and analyze data, and report research conclusions, orally and in writing
- * Demonstrate teamwork and collaboration abilities while conducting research
- * Present environmental issues orally and in writing

Goal Area 10:

- * Demonstrate the impact of economic conditions and political change on human interactions with their environment
- * Demonstrate comprehension of written material
- * Demonstrate the ability to present environmental issues orally and in writing
- * Demonstrate the ability to synthesize, analyze, record and draw conclusions from scientific data.
- * Demonstrate the ability to articulate and justify innovative solutions to environmental challenges
- * Practice effective oral communication in interpersonal, group and public settings
- * Demonstrate teamwork and collaboration in group settings

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

ENVR 1315 - Natural Resource Conservation

Meets MN Transfer Goal Area 3 and 10 - Natural Sciences and People and the Environment. This is an introductory course in natural resource conservation. It includes a survey of the distribution of the world's natural resources, resource use and scarcity, and possible solutions to resource and environmental challenges. The course provides comprehensive coverage of a variety of local, regional, national and worldwide resource and environmental issues. A sustainability theme is stressed.

Student Learning Outcomes:

- * Describe natural resources conservation and management concepts
- * Discuss the tools for creating a sustainable future
- * Explain ecological concepts

- * Describe the human population challenge
 - * Discuss the challenge of world hunger
 - * Describe the nature of soils
 - * Discuss soil conservation and sustainable agriculture practices
 - * Discuss integrated pest management concepts
 - * Discuss aquatic environment issues and challenges
 - * Describe sustainable management of water resources
 - * Describe water pollution issues and challenges
 - * Discuss fisheries conservation practices
 - * Discuss rangeland management practices
 - * Discuss forest management practices
 - * Discuss plant and animal extinction issues and challenges
 - * Discuss wildlife management practices
 - * Describe sustainable waste management practices
 - * Describe air pollution issues and challenges
 - * Explain global warming and climate change concepts
 - * Discuss acid deposition and stratospheric ozone depletion
 - * Discuss minerals, mining and a sustainable society
 - * Explain the issues and options connected with using nonrenewable energy resources
 - * Explain the issues and options connected with creating a sustainable energy system
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

ESOL 0710 - Foundations for Grammar and Writing

This course will focus on basic writing and grammar skills. It will help build writing and grammar fluency for academic purposes. The course will emphasize foundational grammatical structures and the mechanics of American English. It will help students develop strategies for continuous language development.

Student Learning Outcomes:

- * Use verb tenses with increasing accuracy.
- * Memorize irregular verbs.
- * Develop basic understanding of online learning platforms.
- * Apply standard mechanics of American English to all written work.
- * Formulate affirmative, interrogative and negative statements with standard grammar.
- * Employ basic English grammatical structure.
- * Compose simple, compound, and complex sentences.
- * Write using various methods of development.
- * Use the conventions of academic English to write clear and concise sentences and paragraphs.
- * Revise written work for structural, grammatical, and mechanical errors.

Prerequisite(s): Appropriate Placement Score.

(4 C: 4 lect/pres, 0 lab, 0 other)

ESOL 0720 - Foundations of Reading and Vocabulary

This course will focus on basic vocabulary building and reading fluency for academic purposes. The course will emphasize Academic vocabulary, word formation, and cultural context development. Students will explore reading through a variety of materials including novels, newspapers, textbook, and the internet. Students will develop strategies for continuous language development.

Student Learning Outcomes:

- * Recognize common roots, suffixes, and prefixes.
- * Memorize Academic vocabulary.
- * Utilize cultural context clues to comprehend written material.
- * Respond to readings in writing and oral discussion.
- * Develop vocabulary at both the receptive and productive levels.
- * Apply strategies for increasing vocabulary knowledge.
- * Identify topic sentences and main ideas of a variety of written material.
- * Recognize major details.
- * Summarize short passages to demonstrate understanding.

Prerequisite(s): Appropriate Placement Score.

(4 C: 4 lect/pres, 0 lab, 0 other)

ESOL 0730 - Foundations of Speaking and Listening

This course provides foundational speaking and listening support for students who need help in both an academic and daily setting. Students will demonstrate

accurate pronunciation and develop comprehension skills for lectures and discussions.

Student Learning Outcomes:

- * Demonstrate comprehension of classroom and daily directions.
- * Produce appropriate pronunciation for general intelligibility.
- * Formulate requests for clarification.
- * Model academic and general conversation behavior.
- * Develop vocabulary knowledge for academic and general conversations.
- * Summarize lectures and discussions.
- * Recognize academic language and vocabulary.
- * Apply language skills to general topics in-group discussions.
- * Demonstrate speaking and listening skills in impromptu situations.

Prerequisite(s): Appropriate Placement Score.

(4 C: 4 lect/pres, 0 lab, 0 other)

ESOL 0810 - Writing for Academic Purposes

This course will focus on writing and grammar skills necessary for academic success. Students will improve their grammar, writing fluency, editing skills, and ability to write short paragraphs. Students will also learn to use the computer to advance their writing and editing skills, as well as work on formatting documents for an academic audience.

Student Learning Outcomes:

- * Write short paragraphs with a variety of sentence types.
- * Organize their writing according to chronological order, listing, and description.
- * Utilize appropriate vocabulary and verb forms, keeping in mind audience and purpose.
- * Use punctuation with increasing accuracy.
- * Practice the writing process in order to produce coherent and grammatically correct paragraphs.
- * Demonstrate basic competency in using online learning platforms.
- * Apply academic writing practices in online learning platforms for discussions, essays, and quizzes.
- * Develop a controlling idea with specific and relevant examples and details.
- * Evaluate and revise writing as a result of individual, peer and instructor feedback.

Prerequisite(s): ESOL0710 or Appropriate Placement Score..

(4 C: 4 lect/pres, 0 lab, 0 other)

ESOL 0820 - Reading for Academic Purposes

In this course students will be introduced to vocabulary building techniques as well as comprehension strategies. Course materials will focus on diverse fiction and non-fiction reading materials prevalent in both career and college courses, including college textbooks. Students will begin to build a strong academic foundation necessary for success in reading intensive courses.

Student Learning Outcomes:

- * Analyze common roots, prefixes and suffixes.
- * Apply understanding of academic vocabulary.
- * Examine context clues for determining word meaning.
- * Identify topic, main idea, and supporting details.
- * Differentiate implied and stated main ideas in expository and narrative texts.
- * Demonstrate active reading strategies.
- * Summarize academic texts to monitor comprehension.

Prerequisite(s): ESOL0720 or Appropriate Placement Score.

(3 C: 3 lect/pres, 0 lab, 0 other)

ESOL 0830 - Speaking and Listening for Academic Purposes

This course provides foundational speaking and listening skills needed for success in academic and daily settings. Students will develop notetaking skills related to lectures, speaking skills for academic and professional communication, and listening skills for professional and academic communication.

Student Learning Outcomes:

- * Categorize lecture patterns and topics.
- * Develop academic discussion skills.
- * Produce appropriate pronunciation for academic communication.
- * Examine academic lecture topics.
- * Analyze lectures and academic discussions.
- * Identify verbal and nonverbal language markers in academic communication.
- * Distinguish topic, main idea, and details in lectures and discussions.
- * Employ academic language and vocabulary.

Prerequisite(s): ESOL0730 or Appropriate Placement Score.

(3 C: 3 lect/pres, 0 lab, 0 other)

ESOL 0910 - Writing for College

Students in this course will develop writing necessary for college. Students will improve their writing skills to write short essays. This course introduces academic research in multi-modal writing including narrative, descriptive, expository, and persuasive pieces. Students will be introduced to secondary sources and the ethical inclusion of those into their essays.

Student Learning Outcomes:

- * Write short essays with basic introductions, thesis statements, and conclusions.
- * Organize writing according to various patterns.
- * Use a computer to write and format essays.
- * Select appropriate topics for college writing.
- * Support claims in essays through the selection and incorporation of secondary material.
- * Employ the mechanics and conventions of academic English for essay writing.
- * Apply editing skills based on individual, peer, and instructor feedback.
- * Practice the correct use of citation styles.

Prerequisite(s): ESOL0810 or Appropriate Placement Score.

(3 C: 3 lect/pres, 0 lab, 0 other)

ESOL 0920 - Reading for College

In this course students will increase their proficiency in reading strategies, vocabulary acquisition and comprehension. Using academic and professional reading material, students will learn a set of reading techniques to help them become strategic readers and learners. Students will read increasingly longer, diverse, and more complex college-level and expository texts. They will learn to apply these reading strategies to concurrent and subsequent courses.

Student Learning Outcomes:

- * Analyze textbook features for comprehension.
- * Apply various notetaking methods.
- * Utilize various context clues for determining word meaning.
- * Identify topic, stated and implied main ideas, and major and minor details.
- * Evaluate a variety of college-level texts.
- * Determine purpose and tone in expository and narrative texts.
- * Discriminate facts versus opinions.
- * Demonstrate digital literacy appropriate for college level courses.

Prerequisite(s): ESOL0820 or Appropriate Placement Score.

(3 C: 3 lect/pres, 0 lab, 0 other)

ESOL 0930 - Speaking and Listening for College

This course provides foundational speaking and listening skills needed for success in academic settings. Students will learn to take notes from lectures, to give academic presentations and to accurately understand and produce American English speech patterns and pronunciation.

Student Learning Outcomes:

- * Recognize lecture organizational patterns, themes and topics.
- * Analyze topic, main idea, and details in lectures and discussions.
- * Produce appropriate pronunciation, intonation, rhythm and stress in speaking.
- * Distinguish academic language used in various college disciplines.
- * Apply notetaking methods based on college lectures and other academic discourse.
- * Interpret verbal and nonverbal language markers in a lecture.
- * Select appropriate vocabulary and language for academic communication.
- * Develop academic study skills and behaviors.

Prerequisite(s): ESOL0830 or Appropriate Placement Score.

(3 C: 3 lect/pres, 0 lab, 0 other)

ETEC 1507 - Digital Electronics

The primary goals of this course are to help individuals acquire a fundamental knowledge of digital electronics, Boolean algebra, digital devices, analog to digital conversion and digital to analog conversion, and how to apply their knowledge and skills through problem solving, simulation and practical projects.

Student Learning Outcomes:

- * Draw and interpret digital logic and schematic diagrams.
- * Write Boolean logic statements.
- * Correctly fill out and interpret truth tables.

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- * Design and build basic digital logic decision and interface circuits.
 - * Design and build basic timing, counter circuits.
 - * Convert between binary, octal, hexadecimal, and decimal number systems.
 - * Use a PLD (programmable logic device) to implement a Boolean logic statement.
- (3 C: 1 lect/pres, 2 lab, 0 other)

EETEC 1511 - DC Electronics

This is a foundational course in direct current (DC) electricity. This course is designed for students who have no previous experience with electricity. The primary goals of this course are to help individuals acquire a solid foundation in the theories and laws of direct current (DC) electricity, and to apply their knowledge and skills through problem solving, simulation, and practical projects.

Student Learning Outcomes:

- * Analyze series and parallel DC circuits using Ohms law.
- * Measure DC voltage, current, and resistance.
- * Draw and read basic electrical schematic diagrams.
- * Test DC power sources.
- * Select the appropriate size wire for specific applications.
- * Calculate power consumption and losses in basic electrical systems.
- * Identify and apply appropriate safety procedures.

(3 C: 1 lect/pres, 2 lab, 0 other)

EETEC 1512 - AC Electronics

This is a fundamental course in alternating current (AC) electricity. This course is designed for students who have a fundamental knowledge and understanding of the theory and laws of direct current (DC) electricity. The primary goals of this course are to help individuals gain the knowledge and skills necessary to troubleshoot and repair single and three phase AC powered systems and equipment. Individuals will apply these skills through problem solving, simulation, and practical projects.

Student Learning Outcomes:

- * Measure single and three phase voltage.
- * Define and demonstrate single and three phase capacitor circuits.
- * Describe and connect single and three phase inductor circuits.
- * Explain and apply single and three phase transformer circuits.
- * Measure phase angles between voltage and current.
- * Draw and interpret basic electrical schematic diagrams.
- * Identify and apply appropriate safety procedures.

Prerequisite(s): ETEC1511.

(3 C: 1 lect/pres, 2 lab, 0 other)

EETEC 1515 - Safety Awareness

This course design aligns with the Manufacturing Skill Standards Council's (MSSC) assessment and certification system for Safety. The course curriculum follows federally endorsed national standards for production workers. This course will introduce OSHA standards relating to personal protective equipment, HAZMAT, tool safety, confined spaces, and others.

Student Learning Outcomes:

- * Identify appropriate safety procedures in given situations.
- * Interpret Safety Data Sheet (SDS) sheets that are compliant with the Globally Harmonized System.
- * Apply OSHA standards to given situations.
- * List and demonstrate the steps for lockout and tag out procedures.
- * Acquire awareness to the Minnesota Employee Right to Know Act.

(2 C: 2 lect/pres, 0 lab, 0 other)

EETEC 1517 - Maintenance Process and Production

This course is designed to align with the Manufacturing Skill Standards Council's (MSSC) assessment and certification system for Manufacturing Processes.

The course curriculum is based upon federally-endorsed national standards for production workers. This course emphasized, Just-In-Time (JIT) manufacturing principles, basic supply chain management, communication skills, and customer service.

Student Learning Outcomes:

- * Identify customer needs
- * Determine resources available for the production process
- * Set up equipment for the production process

- * Set team production goals
 - * Make job assignments
 - * Coordinate work flow with team members and other work groups
 - * Communicate production and material requirement and product specifications
 - * Perform and monitor the process to make the product
- (2 C: 2 lect/pres, 0 lab, 0 other)

EETEC 1524 - Print Reading and Design

This is a foundational course in industrial print reading. This course is designed for students who have no previous experience with print reading. The primary goals of this course are to help individuals acquire a solid foundation in print reading, mechanical drafting concepts, and machine layout tools to transfer measurements from drawing to stock. Student will be able to understand and read piping and instrumentation diagrams (PandID).

Student Learning Outcomes:

- * Describe the three principal views and dimensions of a 3-view drawing and accurately draw a 3-view of a simple object.
- * Explain the requirements of an isometric drawing and produce an accurate isometric drawing of a simple object.
- * Explain the basic rules of interpreting a mechanical drawing.
- * Demonstrate the ability to read a mechanical drawing.
- * Identify information found on a title block using a PandID.
- * Using a PandID legend, identify the valve symbols used on piping and instrumentation diagrams including gate, globe, butterfly, check, and safety valves.
- * Using a PandID legend, identify the types of valve operators used including pneumatic (diaphragm), motor, hydraulic, and solenoid operated.
- * Discuss the major flow path found on a PandID example.
- * Identify and apply appropriate safety procedures.

(2 C: 1 lect/pres, 1 lab, 0 other)

EETEC 1535 - Networking Systems

This course covers the foundation of electronic communication networks and the associated wiring and equipment. Networks included are, Field Bus, Profibus, Ethernet, and Devicenet.

Student Learning Outcomes:

- * Identify types of networks.
- * Differentiate between different networks.
- * Test network cables and wiring.
- * Assemble network cables.
- * Identify components of a given network.
- * Utilize different measures of network security.

(2 C: 1 lect/pres, 1 lab, 0 other)

EETEC 2515 - Introduction to Process Control

This course covers the fundamental principles of process measurement and control equipment and systems. Student will acquire the knowledge required to read and interpret piping and instrument diagrams, understand the terminology and language of control systems, and control strategies. Students will be introduced to a variety of instruments commonly used in industry for measurement and control.

Student Learning Outcomes:

- * Define terms used in process control such as open and closed loop control, scaling, and proportional, integral, and derivative (PID) control.
- * Describe the application of sensors such as RTD's, thermistors, capacitive level and pressure sensors, and flow meters.
- * Describe the operation and application of final control elements such as heaters, valves, and pumps.
- * Describe the operation and application of transmitters and transducers.
- * Perform conversions between measurement units, sensor units, output units and display units using both English and Metric units.
- * Describe the operation of on/off, proportional and time-proportional control loops.
- * Interpret Piping and Instrumentation Diagrams.
- * Identify and apply appropriate safety procedures.

Prerequisite(s): ETEC1512.

(3 C: 2 lect/pres, 1 lab, 0 other)

EETEC 2521 - Mechanical Systems

This course provides students with the fundamental knowledge and skills necessary to install, and maintain mechanical systems. Course study includes, main-

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tenance scheduling, hand and power tools. Precision measurement tools, power transmission systems, bearings, lubrications, couplings, pumps, alignment, and vibration analyzers. Course is also an introduction to refrigeration systems, boiler systems, and HVAC systems.

Student Learning Outcomes:

- * Identify basic mechanical drive components.
- * Assemble, align, and disassemble mechanical mechanisms.
- * Perform coupling and shaft alignment.
- * Install, adjust, and maintain belt and chain drive tensions.
- * Correctly identify and maintain bearings.
- * Understand and demonstrate basic vibration analysis.
- * Troubleshoot and maintain centrifugal pumps.
- * Demonstrate mechanical troubleshooting skills.
- * Identify and apply appropriate safety procedures.

Prerequisite(s): ETEC1517, ETEC1528.

(3 C: 1 lect/pres, 2 lab, 0 other)

ETEC 2525 - FANUC Robotics Certification

This course teaches students basic handling tool operation and programing. The course covers the tasks that an operator, technician, engineer or programmer who needs to setup, record and/or troubleshoot programs on a FANUC Robotics Handling Tool Software Package. After successful completion of this course, students will receive an industry recognized FANUC Certificate.

Student Learning Outcomes:

- * Create, modify and execute a material handling program.
- * Create and execute macro's.
- * Demonstrate how to monitor, force and simulate input and output signals.
- * Perform a backup and restore of individual programs and files.
- * Identify and apply appropriate safety procedures.

Prerequisite(s): ETEC1512.

(2 C: 1 lect/pres, 0.5 lab, 0.5 other)

ETEC 2532 - Instrumentation Control and Data Acquisition

This course covers the knowledge and skills required to calibrate, install, and maintain process control instruments, actuators, operator interface, and controllers. Students practice calibrating, and installing instruments, tuning controllers, and use test equipment to analyze process control systems.

Student Learning Outcomes:

- * Calibrate temperature, pressure, flow, and level transmitters.
- * Perform routine maintenance on control valves and actuators.
- * Interpret and draw piping and instrumentation diagrams.
- * Configure operator interface and data acquisition programs.
- * Configure and install process control loops.
- * Perform loop tuning on basic control loops.
- * Demonstrate flow loop data acquisition and correctly wire.
- * Perform routine maintenance on instrument air systems.
- * Identify and apply appropriate safety procedures.

Prerequisite(s): ETEC2515.

(4 C: 2 lect/pres, 2 lab, 0 other)

ETEC 2535 - Fluid Power and Control

This course is an introductory course in fluid power and control systems used in industry. The course is designed for students who have no previous experience in working with fluid power. The primary goals of this course are to help individuals acquire the knowledge and skills required to install, troubleshoot, and maintain hydraulic and air powered systems.

Student Learning Outcomes:

- * Interpret and draw schematics of air and hydraulics systems.
- * Assemble and disassemble air and hydraulic components.
- * Perform routine maintenance of actuators, control valves, pumps and other supply equipment in fluid/air systems.
- * Connect and test electro-mechanical control devices to air/fluid systems.
- * Demonstrate appropriate safety precautions and understand how to release stored energy.
- * Troubleshoot common problems that occur in an air/fluid system and repair.
- * Interpret pneumatics and hydraulic device specifications and cross reference to other devices.
- * Calculate the force of air/fluid systems will have in devices.
- * Identify and apply appropriate safety procedures.

Prerequisite(s): ETEC1517, ETEC1528.

(4 C: 2 lect/pres, 2 lab, 0 other)

ETEC 2541 - Electrical Motors and Control Systems

This course provides students with the fundamental knowledge and skills necessary to install, and maintain a variety of motor controllers, relays and other relay logic, continuing into AC and DC motors and motor controllers used in industry. This course emphasizes mastering line diagrams and control panel wiring.

Student Learning Outcomes:

- * Demonstrate mechanical construction of control panels.
- * Maintain industry-wiring standards.
- * Interpret AC and DC motor specifications.
- * Connect solid state DC drives to DC motors.
- * Draw and interpret electrical motor control diagrams to use in troubleshooting.
- * Successfully wire and connect reversing DC motor starters.
- * Connect and test overload protection and monitoring devices.
- * Perform routine maintenance of AC and DC motors.

Prerequisite(s): ETEC1512.

(3 C: 1 lect/pres, 2 lab, 0 other)

ETEC 2542 - Electric Motor Control II

This course provides students with the knowledge and skills necessary to install, and maintain a variety of motor controllers, relays and other relay logic, continuing into AC and DC motors and motor controllers used in industry. This course emphasizes incorporating Programmable Logic Controllers communicating to Variable Frequency Drive controlled AC motors.

Student Learning Outcomes:

- * Maintain industry-wiring standards.
- * Interpret AC and DC motor specifications.
- * Connect Variable Frequency AC drives to AC motors.
- * Draw electrical motor control diagrams based off an existing motor circuit.
- * Connect reversing AC motor starters.
- * Connect and test overload protection and monitoring devices.
- * Perform routine maintenance of AC motors.

Prerequisite(s): ETEC2541.

(3 C: 1 lect/pres, 2 lab, 0 other)

ETEC 2543 - Programmable Logic Control

This course covers the knowledge and skills required to install and maintain programmable logic controllers (PLC) in automated control systems. Students will learn to write programs to solve basic control problems, connect sensors and actuators, and configure PLCs.

Student Learning Outcomes:

- * Maintain industry-wiring standards.
- * Interpret and draw basic ladder logic diagrams and programs.
- * Draw electrical input output wiring diagrams.
- * Connect discrete input/output devices to the PLC.
- * Connect analog input/output devices to the PLC.
- * Monitor and modify PLC hardware configurations and programs.
- * Interpret PLC module specifications.
- * Troubleshoot and repair PLC control systems.
- * Demonstrate how to perform disaster recovery.

Corequisite(s): ETEC2542

Prerequisite(s): ETEC1507, ETEC1512.

(3 C: 1 lect/pres, 2 lab, 0 other)

ETEC 2544 - Automated Manufacturing Systems

This course enables the student to work as a member of a team focused on maintaining an automated manufacturing system. This capstone course pulls everything together including problem solving and communication skills.

Student Learning Outcomes:

- * Maintain industry-wiring standards.
- * Perform modifications of existing automated system.
- * Perform system maintenance tasks.
- * Identify systemic problems.
- * Implement safety systems.
- * Demonstrate ability to work as part of a team.
- * Demonstrate effective communication skills.

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Prerequisite(s): ETEC2532.
(3 C: 1 lect/pres, 2 lab, 0 other)

ETEC 2546 - Power Plant Technology

This course teaches basic power plant technology, power plant engineering, and energy conversion offered in departments of mechanical engineering and nuclear engineering. The focus of this course is on fossil and nuclear power plants.

Students will also learn about other power generating facilities, such as Hydro, Solar, and Wind.

Student Learning Outcomes:

- * Demonstrate understanding of thermodynamics.
- * Explain how a condensate feed-water systems and circulating water systems function.
- * Describe the operation of a power plant.
- * Define how thermal fission reactors function.
- * Describe the basic function of nuclear power generation.
- * Identify all the other alternative power generation sources and their strengths and weaknesses.
- * Demonstrate knowledge of the environmental aspects and impacts of power generation.
- * Troubleshoot, repair, and analyze equipment used in power generation.

Prerequisite(s): ETEC2515, ETEC2521.

(4 C: 2 lect/pres, 2 lab, 0 other)

ETEC 2547 - Mechanical Fundamentals for Process Control

This course is a comprehensive introduction to the workings of a modern manufacturing facility in the process industry. Key topics include valves, vessels, motors and turbines, heat exchangers, cooling towers, reactors and distillation, extraction and separation systems, and process instrumentation.

Student Learning Outcomes:

- * List and Physically identify motors, pumps, valves, heat exchangers, cooling towers, centrifuges, compressors, thermal oxidizers, scrubbers, distillation towers, evaporators, and molecular sieves.
- * Describe the internal workings and characteristics of process equipment.
- * Explain the significance of major process equipment and their interaction within process systems

Prerequisite(s): ETEC1512, ETEC2521.

(3 C: 2 lect/pres, 1 lab, 0 other)

ETEC 2551 - Robotic Operations

Course covers operations of a robot with automated cells. Students will learn correct power up procedures, e-stops, tooling control, I/O types, conditional programming and motion types. Students will also transducers that are photo, inductive, capacitive, analog, and machine vision. Integration of PLC I/O, programing, and sensors.

Student Learning Outcomes:

- * Demonstrate correct power up procedure for a robotic system
- * Define operation standards and procedures
- * Identify correctly what I/O is being used and its functions
- * Troubleshoot and diagnose photo, inductive, capacitive, and analog sensors.
- * Correctly show how to set up vision system on a robot.
- * Identify and apply appropriate safety procedures.

Prerequisite(s): ETEC2525.

(3 C: 1 lect/pres, 2 lab, 0 other)

ETEC 2553 - Robotics I

This course covers robot applications in an industry setting. Course also covers types of robots, robotic movement, cell design and structure, and safety specifically for robots. Students will learn correct power up procedures, e-stops, tooling control, I/O types, conditional programming, motion types, integration of PLC I/O, programming, and sensors.

Student Learning Outcomes:

- * Describe and analyze rigid motion.
- * Solve simple inverse kinematics problems.
- * Design and layout a cell structure.
- * Identify different robot tooling device.
- * Describe where robots are used in industry and their tasks.
- * Demonstrate correct power up procedure for a robotic system.

* Identify correctly what I/O is being used and its functions.

* Identify and apply appropriate safety procedures.

Prerequisite(s): ETEC1521.

(4 C: 2 lect/pres, 2 lab, 0 other)

ETEC 2555 - Robotics II

Students will implement the robotic application and design they developed from the other courses. Course covers normal maintenance and troubleshooting, software, and hardware failure, configuring controller for different applications, and robot configuration such as calibration. Students will document all process throughout the development of a robotics cell. Continue to expand on robot controllers, PLC's and advanced programming.

Student Learning Outcomes:

- * Describe different types of software utilized in robots.
- * Navigate through software and write basic code.
- * Correctly list the main hardware components on a robot.
- * Demonstrate electrical skills in robot controller software.
- * Show analytical skills in robot controller software.
- * Create program code from start to finish.
- * Demonstrate knowledge of end of arm tooling.
- * Identify and apply appropriate safety procedures.

Prerequisite(s): ETEC2553.

(4 C: 2 lect/pres, 2 lab, 0 other)

ETEC 2570 - Advanced Mechanical Systems

This course teaches students a higher level knowledge and skills required to install, and maintain pumps, compressors, hoists, and rigging. Students learn all the skills required for working in industry such as pipe fitting, pipe sweating, proper fasteners. Students become skilled using advanced predictive maintenance equipment, such as infrared thermography, and vibration analyzers.

Student Learning Outcomes:

- * Identify major components of mechanical drive systems.
- * Disassemble, inspect, refurbish, and reassemble mechanical mechanisms.
- * Perform coupling and shaft alignment using three different procedures.
- * Check and adjust belt and chain drive tensions, along with belt pitch, size, and materials.
- * Identify different chain sizes and functions.
- * Perform vibration analysis. Monitor and analyze vibration data, and offer recommendations on replacement.
- * Perform routine maintenance of mechanical mechanisms. Gather PM data and analyze information.
- * Demonstrate proper rigging equipment and setup procedures for different applications.
- * Troubleshoot, repair, and analyze mechanical systems.
- * Identify and apply appropriate safety procedures.

Prerequisite(s): ETEC2521.

(3 C: 1 lect/pres, 2 lab, 0 other)

ETEC 2575 - Vision Systems for Robots

Upon successful completion of this course, the student can identify the components of a vision system, install vision hardware, develop an application, program the robot, perform error recovery procedures and follow recommended safety practices.

Student Learning Outcomes:

- * Demonstrate the ability to setup and position camera correctly.
- * Knowledgeable of basic vision concepts and lighting.
- * Calibrate a camera so that it will read material correctly.
- * Program a robot to respond to the results of the vision.
- * Identify and apply appropriate safety procedures.

Prerequisite(s): ETEC2525.

(2 C: 1 lect/pres, 1 lab, 0 other)

FMBT 1112 - Foundations for Farm Business Management

This course is an overview of the Farm Business Management Program. The student will be introduced to goal setting, self and business assessment, record keeping, and business projections to provide the foundation for personal and business management progress. Current issues affecting business management are an integral part of the course.

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Student Learning Outcomes:

- * Examine current levels of business exposure to risk
 - * Utilize the decision making process
 - * Determine the unpaid and paid labor needs for the farm business
 - * Determine the capital needs of the business (i.e. buildings, land, equipment)
 - * Identify balance sheet ratios
 - * Determine credit needs
 - * Construct the cash flow plan
 - * Explain the process for conducting a year-end closeout and analysis
 - * Apply enterprise budgeting concepts
 - * Interpret current issues related to the farm business
- (4 C: 0 lect/pres, 0 lab, 4 other)

FBMT 1121 - Preparation for Farm Business Analysis

This course will take the student through a step by step procedure to close out a complete year of farm business records. This course will emphasize tax planning, completing inputs to livestock and crop enterprises, and emphasizing cash and liabilities accuracy. A completed business and enterprise analysis will be the course focus

Student Learning Outcomes:

- * Determine credits and deductions for tax management
 - * Capture the data necessary to complete a business analysis
 - * Determine compatibility of new technology with existing systems
 - * Compare the sources, pricing, and performance of business and production inputs
 - * Enhance the record system detail through expanded enterprising of income and expenses
 - * Evaluate business, family, and personal goals
 - * Monitor cash flow by comparing actual vs. planned
 - * Explain how the farm management cycle pertains to the farm business
 - * Recognize the implications of asset valuation and depreciation
- (4 C: 0 lect/pres, 0 lab, 4 other)

FBMT 1122 - Implementing the System Management Plan

This course continues to build on the foundation of farm business management. The student will complete a farm business financial and enterprise analysis. Sound financial record keeping is an integral component.

Student Learning Outcomes:

- * Maintain production and financial business records
 - * Interpret business analysis
 - * Utilize business analysis to improve business organization and efficiency
 - * Demonstrate strategic decision-making skills
 - * Evaluate personal and business goals and plans
 - * Manage business resources and technologies
 - * Manage risk
- (4 C: 0 lect/pres, 0 lab, 4 other)

FBMT 1131 - Managing and Modifying Farm System Data

This course will help the student refine their farm business data system and assist them in applying year end procedures for farm business analysis. Students improve accuracy in the following: farm enterprise analysis, tax planning, data filing, and cash and liabilities checks.

Student Learning Outcomes:

- * Prioritize areas of risk
 - * Refine method(s) of recording family living expenses and nonfarm business transactions
 - * Apply goals to business planning processes
 - * Investigate the advantages and disadvantages of ownership of capital assets
 - * Organize paid and unpaid labor and management resources for the farm business
 - * Design a production input acquisition plan
 - * Audit financial data using cash and liability accuracy checks
 - * Determine pre-payment options and implications
 - * Apply marketing strategies to tax planning
- (4 C: 0 lect/pres, 0 lab, 4 other)

FBMT 1132 - Interpreting and Using Farm System Data

This course provides an opportunity for the student to view the farm business and

its various components through the application of balance sheets, farm personal and managerial inventories, enterprise reports and historical data.

Student Learning Outcomes:

- * Compile a farm business plan
 - * Create a marketing plan
 - * Compare historical farm data to current performance
 - * Identify key business ratios
 - * Compare business profitability to benchmark data
 - * Interpret current business projections
 - * Apply business and personal goals
 - * Validate ownership options of capital assets within a business
 - * Formulate a risk management plan
 - * Implement enterprise budgeting
- (4 C: 0 lect/pres, 0 lab, 4 other)

FBMT 1211 - Introduction to Farm Business Management

This course introduces basic farm business management concepts. Students will study the farm management planning cycle and develop an understanding of its relationship to: family and farm business goal setting, cash and enterprise accounting principles, and tax planning.

Student Learning Outcomes:

- * Explain the farm business management cycle (plan, implement, control)
 - * Complete a risk management assessment in all aspects of both farm and non farm operations
 - * Differentiate between tax and management depreciation
 - * Estimate income and expenses for the tax year
 - * Describe farm business enterprise characteristics (i.e. crops, livestock, value added)
 - * Execute a comprehensive record system
 - * Construct selected financial statements (i.e. balance sheet)
 - * Investigate available technologies for improving the farm business
 - * Establish business, family, and personal goals
 - * Examine current enterprise resource needs (i.e. feed, seed, fertilizer)
 - * Integrate time management strategies for the operation
- (4 C: 0 lect/pres, 0 lab, 4 other)

FBMT 1213 - Managing a Farm System in a Global Economy

This course assists the students in achieving awareness of the development of agricultural policies and practices throughout the world and assessing the impact of these policies and practices on the profitability and viability of their farm business.

Student Learning Outcomes:

- * Identify global markets and competitors
 - * Assess farm technology needs to compete in global markets
 - * Identify the competitive advantages of the farm business in a global economy
 - * Analyze the impact of global policies and economics on the farm business
 - * Relate global environmental issues to the farm business
- (2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 1223 - Using System Analysis in Total Farm Planning

This course assists the students with a farm business analysis, and the exploration of possible implications and/or solutions of these concepts. A systematic method to assess farm business strengths and weaknesses based on the analysis will be used.

Student Learning Outcomes:

- * Review completed farm business analysis
 - * Assess farm business strengths and weaknesses from the farm business analysis
 - * Summarize the implications of the farm business analysis
- (2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 1233 - Application of Productive Enterprise Information

This course describes procedures for applying enterprise information provided by computerized analysis of farm business accounts.

Student Learning Outcomes:

- * Verify enterprise contributions to farm profitability
 - * Benchmark enterprise analysis information
 - * Compare enterprise practices and technologies with benchmarks (special sorts)
- (2 C: 0 lect/pres, 0 lab, 2 other)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

FBMT 2141 - Interpreting and Evaluation of Financial Data

This course continues to expand on preparation and evaluation of the farm business analysis. This course provides continued guidance and perfection of business record close out procedures, tax implications of management decisions, and continues to monitor farm business and family goals.

Student Learning Outcomes:

- * Refine data management system(s) to enhance the farm business analysis process
 - * Establish detailed data management systems
 - * Analyze enterprise budgets
 - * Compare current business projections with historical data
 - * Manage labor and management resources
 - * Evaluate impact of personal retirement plans on tax liability
 - * Determine profitability of new technology systems
- (4 C: 0 lect/pres, 0 lab, 4 other)

FBMT 2142 - Interpreting Trends in Business Planning

This course examines whole farm, enterprise, balance sheet, and inventory trends. Current analysis data is compared to historical data in making future farm business planning decisions. Financial ratios are used to indicate the farm financial structure

Student Learning Outcomes:

- * Evaluate financial accounting system(s) for effectiveness and accuracy
 - * Analyze historical farm data
 - * Analyze farm financial ratios
 - * Interpret trend data for farm business decision-making processes
 - * Analyze working capital and debt levels
 - * Analyze business, family and personal goals
 - * Examine trend data for business, family, and personal goal setting
 - * Integrate risk management and production plans
 - * Examine trend data to modify marketing strategies
- (4 C: 0 lect/pres, 0 lab, 4 other)

FBMT 2151 - Strategies in Farm System Data Management

This course will help the student focus on long term strategies necessary to maintain and enhance the farm business and personal future financial goals. The student will complete the year by developing an accurate, usable business analysis.

Student Learning Outcomes:

- * Relate tax management to estate planning
 - * Assess capital asset ownership options
 - * Evaluate labor and management performance
 - * Validate the importance of financial and production data
 - * Evaluate best management practices
 - * Incorporate farm financial trend data in establishing a tax management strategy
 - * Relate farm tax laws to the business
 - * Assess the profitability of technology investments
- (4 C: 0 lect/pres, 0 lab, 4 other)

FBMT 2152 - Integrating System Information for Financial Planning

This course uses farm system information to develop a farm financial plan. Interpretation and analysis of the farm system data will enhance the reliability of the farm plan. The comprehensive farm plan will integrate historical trends, farm and personal goals, financial and enterprise performance of the farm business.

Student Learning Outcomes:

- * Incorporate a risk management plan
 - * Plan business exit strategies
 - * Develop an investment plan for retirement
 - * Use trend data to develop enterprise budgets
 - * Compare long-range business plan options
 - * Refine business, family and personal goals
 - * Modify financial plans as required by business needs
 - * Investigate trend data to develop a business needs assessment
 - * Analyze income statements
- (4 C: 0 lect/pres, 0 lab, 4 other)

FBMT 2161 - Examination of the Context of Farm System Management

This course is designed to assist students in preparation of improved farm system management procedures. Students in this course will evaluate several years of an

improved farm system analysis

Student Learning Outcomes:

- * Prioritize strategies to improve enterprise trend data
 - * Predict future changes in financial ratios
 - * Redefine future business, family, and personal goals
 - * Cite strengths and weaknesses of the management system
 - * Investigate business structure models
 - * Explain deferred tax liability
 - * Evaluate tax strategies
 - * Appraise the financial and data accounting system
- (4 C: 0 lect/pres, 0 lab, 4 other)

FBMT 2162 - Refining Farm System Management

This course is the culmination of activities designed to enable the student to develop and implement a comprehensive farm business strategic plan. The student will use the components of the Farm Business Management Program to develop and support a farm business strategic plan.

Student Learning Outcomes:

- * Identify business continuation opportunities
 - * Justify business projections
 - * Justify enterprise budgeting
 - * Evaluate financial ratios
 - * Prioritize strategies to improve enterprise trend direction
 - * Evaluate historical farm trends
 - * Assess a risk management plan
 - * Evaluate emerging technologies
- (4 C: 0 lect/pres, 0 lab, 4 other)

FBMT 2200 - Special Topics- General Farm Management

Analysis of special topics in crop production for students actively engaged in the operation and management of a farm business.

Student Learning Outcomes:

- * Maintain production and financial business records
 - * Interpret business analysis
 - * Utilize business analysis to improve business organization and efficiency
 - * Demonstrate strategic decision-making skills
 - * Evaluate personal and business goals and plans
 - * Manage business resources and technologies
 - * Manage risk
- (1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2201 - Special Topics - General Farm Management

This course covers special topics of interest in general farm management.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
 - * Survey the concepts which apply to the farm business
 - * Investigate general farm business management concepts
- (1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2202 - Special Topics - General Farm Management

This course covers special topics of interest in general farm management.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
 - * Survey the concepts which apply to the farm business
 - * Investigate general farm business management concepts
- (1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2203 - Special Topics - General Farm Management

This course covers special topics of interest in general farm management.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
 - * Survey the concepts which apply to the farm business
 - * Investigate general farm business management concepts
- (1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2204 - Special Topics - General Farm Management

This course covers special topics of interest in general farm management.

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
 - * Survey the concepts which apply to the farm business
 - * Investigate general farm business management concepts
- (1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2205 - Special Topics - General Farm Management

This course covers special topics of interest in general farm management.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
- * Survey the concepts which apply to the farm business
- * Investigate general farm business management concepts
- * Compare concepts which apply to the farm business
- * Develop concepts which apply to the farm business
- * Investigate general farm business concepts

(2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2206 - Special Topics - General Farm Management

This course covers special topics of interest in general farm management.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
- * Survey the concepts which apply to the farm business
- * Investigate general farm business management concepts
- * Compare concepts which apply to the farm business
- * Develop concepts which apply to the farm business
- * Investigate general farm business concepts

(2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2207 - Special Topics - General Farm Management

This course covers special topics of interest in general farm management.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
- * Survey the concepts which apply to the farm business
- * Investigate general farm business management concepts
- * Compare concepts which apply to the farm business
- * Develop concepts which apply to the farm business
- * Investigate general farm business concepts

(2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2208 - Special Topics - General Farm Management

This course covers special topics of interest in general farm management.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
- * Survey the concepts which apply to the farm business
- * Investigate general farm business management concepts
- * Compare concepts which apply to the farm business
- * Develop concepts which apply to the farm business
- * Investigate general farm business concepts

(2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2209 - Special Topics - General Farm Management

This course covers special topics of interest in general farm management.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
- * Survey the concepts which apply to the farm business
- * Investigate general farm business management concepts
- * Compare concepts which apply to the farm business
- * Develop concepts which apply to the farm business
- * Investigate general farm business concepts

(2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2210 - Special Topics-Marketing

Analysis of special topics in crop production for students actively engaged in the operation and management of a farm business.

Student Learning Outcomes:

- * Utilize business analysis to improve business organization and efficiency
- * Demonstrate strategic decision-making skills

- * Evaluate personal and business goals and plans

- * Manage business resources and technologies

(1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2211 - Special Topics - Marketing

Analysis of special topics in marketing for students actively engaged in the operation and management of a farm business.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
- * Survey the concepts which apply to the farm business
- * Investigate general marketing concepts

(1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2212 - Special Topics - Marketing

Analysis of special topics in marketing for students actively engaged in the operation and management of a farm business.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
- * Survey the concepts which apply to the farm business
- * Investigate general marketing concepts

(1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2213 - Special Topics - Marketing

Analysis of special topics in marketing for students actively engaged in the operation and management of a farm business.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
- * Survey the concepts which apply to the farm business
- * Investigate general marketing concepts

(1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2214 - Special Topics - Marketing

Analysis of special topics in marketing for students actively engaged in the operation and management of a farm business.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
- * Survey the concepts which apply to the farm business
- * Investigate general marketing concepts

(1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2220 - Special Topics - Crops

This course covers topics of special interest in crops.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
- * Survey the concepts which apply to the farm business
- * Investigate general crop concepts

(1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2221 - Special Topics-Crops

This course covers topics of special interest in crops.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
- * Survey the concepts which apply to the farm business
- * Investigate general crop concepts

(1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2222 - Special Topics - Crops

This course covers topics of special interest in crops.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
- * Survey the concepts which apply to the farm business
- * Investigate general crop concepts

(1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2223 - Special Topics-Crops

This course covers topics of special interest in crops.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
 - * Survey the concepts which apply to the farm business
 - * Investigate general crop concepts
- (1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2224 - Special Topics- Crops

This course covers topics of special interest in crops.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
 - * Survey the concepts which apply to the farm business
 - * Investigate general crop concepts
- (1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2230 - Special Topics - Livestock

This course covers topics of special interest in livestock.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
 - * Survey the concepts which apply to the farm business
 - * Investigate general livestock concepts
- (1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2231 - Special Topics-Livestock

This course covers topics of special interest in livestock.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
 - * Survey the concepts which apply to the farm business
 - * Investigate general livestock concepts
- (1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2232 - Special Topics-Livestock

This course covers topics of special interest in livestock.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
 - * Survey the concepts which apply to the farm business
 - * Investigate general livestock concepts
- (1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2233 - Milker Training School

This course covers topics of special interest in livestock.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
 - * Survey the concepts which apply to the farm business
 - * Investigate general livestock concepts
- (1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2234 - Special Topics - Livestock

This course covers topics of special interest in livestock.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
 - * Survey the concepts which apply to the farm business
 - * Investigate general livestock concepts
- (1 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2235 - Special Topics-Livestock

This course covers topics of special interest in livestock.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
 - * Survey the concepts which apply to the farm business
 - * Investigate general livestock concepts
 - * Evaluate concepts which apply to the farm business
 - * Compare concepts which apply to the farm business
 - * Develop concepts which apply to the farm business
- (2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2236 - Special Topics - Livestock

This course covers special topics of interest in livestock.

Student Learning Outcomes:

- * Utilize business analysis to improve business organization and efficiency
 - * Demonstrate strategic decision-making skills
 - * Evaluate personal and business goals and plans
 - * Manage business resources and technologies
- (2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2237 - Special Topics - Livestock

This course covers topics of special interest in livestock.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
 - * Survey the concepts which apply to the farm business
 - * Investigate general livestock concepts
 - * Evaluate concepts which apply to the farm business
 - * Compare concepts which apply to the farm business
 - * Develop concepts which apply to the farm business
- (2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2238 - Special Topics - Livestock

This course covers topics of special interest in livestock.

Student Learning Outcomes:

- * Examine the effects of incorporation into the farm business
 - * Survey the concepts which apply to the farm business
 - * Investigate general livestock concepts
 - * Evaluate concepts which apply to the farm business
 - * Compare concepts which apply to the farm business
 - * Develop concepts which apply to the farm business
- (2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2239 - Special Topics-Livestock

This course covers special topics of interest in livestock.

Student Learning Outcomes:

- * Utilize business analysis to improve business organization and efficiency
 - * Demonstrate strategic decision-making skills
 - * Evaluate personal and business goals and plans
 - * Manage business resources and technologies
- (2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2243 - Using Financial Instruments in Farm System Management

This course integrates the application of various financial instruments used in acquiring capital for use in the business and investigates ways in which both earnings and financial progress can be measured.

Student Learning Outcomes:

- * Develop a management (financial and production) portfolio
 - * Correlate financial documents for acquiring capital
 - * Apply decision-making criteria
- (2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2253 - System Plans and Projections

This course enables the combination of concepts for preparing farm system plans and projections, and the interaction of possible implications and/or solutions of these concepts.

Student Learning Outcomes:

- * Review the farm business plan
 - * Evaluate business performance in relation to the vision for the future
 - * Revise the farm business plan
- (2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2263 - Evaluating Farm System Programs

This course develops an awareness of individuals and agencies, both public and private, which have expertise available to assist the farm operator to solve farm systems problems. It enables study and application of farm business evaluation concepts, and exploration of possible implications. Exact subject matter and time spent per topic will vary depending on student need, location, and time.

Student Learning Outcomes:

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

- * Assemble management resource team
- * Analyze strengths and weakness of the business with the management resource team
- * Develop a plan of action for improving the business
(2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2930 - Fundamentals of Financial Mgmt. as it relates to Risk Mgmt.

This course is intended to have the student enhance their decision-making skills relating to business risk management. This course will have the student further investigate tools available to their business that would be effective in reducing potential risk for their operation. Emphasis will be placed on having the student research risk management options that will meet their business, family, and personal needs.

Student Learning Outcomes:

- * Implement methods of monitoring budgets/plans to enhance their risk management program
- * Adopt strategies to assist in anticipating business risk
- * Examine methods of determining the ability to absorb risk
- * Examine methods of determining business risk
- * Evaluate risk factors affecting the farm operations
- * Analyze management structure to determine if modification is beneficial in reducing risk
- * Re-address business, family, and financial goals to help explore risk management techniques
- * Interpret enterprise analysis historical data to enhance decision-making process in risk management strategy
- * Utilize their farm financial ratios to assist in determining risk management needs
- * Examine financial trends to determine future bearing capabilities
(3 C: 0 lect/pres, 0 lab, 3 other)

FBMT 2931 - Applied Financial Management as it Relates to Risk Management

This course is intended to have the student apply concepts in financial management that can be used in the development of a business risk management program. The student is to implement risk management tools that will assist in meeting their business, family and personal needs.

Student Learning Outcomes:

- * Implement risk management strategies that will meet the goals of the business risk management program
- * Apply information gained from analyzing of historical business data in determining risk in the business
- * Apply knowledge gained from analysis of historical business data in determining risk in the business
- * Implement use of risk management tools that will address risk factors affecting the business
- * Implement a modified management structure for the business that will benefit in reducing business risk
- * Develop a risk management program that meets business, family and financial goals
- * Apply enterprise analysis data in decision-making process of determining risk management needs
- * Utilize farm financial ratios of the business in development of risk management program
- *utilize financial trends in the development of a risk management program
(3 C: 0 lect/pres, 0 lab, 3 other)

FBMT 2932 - Fundamentals of Financial Mgmt/Strategic Planning Emphasis

This course will enable students to identify the elements necessary to evaluate and create a strategic plan for the business. Determining uses for the plan today and tomorrow and developing a plan to locate those team members necessary for strategic plan creation.

Student Learning Outcomes:

- * Determine what part of the strategic plan will have on the farm portfolio
- * Recognize the importance of both internal and external environmental monitoring
- * Identify the action necessary to implement the plan
- * Categorize the steps necessary to formulate action plans and contingency plans

- * Recognize key financial ratios to use to create gap analysis to identify the ideal future and business capacity
- * Identify specific business trends and evaluate a potential business performance audit
- * Diagram the primary elements of strategic business modeling
- * Contrast the driving force of a business from distinctive business competencies
- * Recognize the who, what, how, and why in creating a business mission statement
- * Determine elements of business values. Scan and integrate those with family, business and financial goals
- * Describe the process of strategic planning
(3 C: 0 lect/pres, 0 lab, 3 other)

FBMT 2933 - Applied Financial Mgmt./Strategic Planning Emphasis

This course will provide practical application of strategic planning skills. Application skills will be practiced upon and applied to the student's business and business plan.

Student Learning Outcomes:

- * Update the current business portfolio to reflect implemented strategic plans
- * Craft an internal and external monitoring which includes the use of business analysis
- * Create an implementation plan to apply the action plans in a prioritized manner
- * Develop a contingency plan for the business
- * Develop action plans to be used to close the gap between actual and desired performance
- * Perform gap analysis and determine measurable difference between future vision and today's performance
- * Gather and analyze business enterprise and financial data to design a specific performance audit
- * Determine direction of the business by visualizing the future and describing what it looks like
- * Identify quality or attribute that the business possesses that makes it different from others
- * Identify and prioritize the driving forces in the business
- * Participate with the planning team in writing a general mission statement for the business
- * Examine values, operating philosophy and determine the stakeholders
- * Develop a planning team; set time lines and determine who will develop necessary data
(3 C: 0 lect/pres, 0 lab, 3 other)

FBMT 2934 - Fundamental of Financial Management/Business Plan Emphasis

This course will provide practical application of the business plan. Application skills will be practiced and applied as the student's business plan is prepared and implemented.

Student Learning Outcomes:

- * Use the analysis information to determine the business cash needs for the upcoming production year
- * Complete the analysis of their business
- * Revise and rework their plan after the completion of the annual analysis
- * Recognize the need to monitor and re-evaluate the plan on a regular basis
- * Use the business plan in a manner that will allow for decision making in a correct business sense
- * Determine the strengths and weaknesses of their business
- * Evaluate their vision statement and revise as necessary for the continuation of their business
- * Evaluate their mission statement and revise as necessary
- * Determine what changes to make in their business in order to better compete in today's market place
- * Develop a business plan
(3 C: 0 lect/pres, 0 lab, 3 other)

FBMT 2935 - Applications of Financial Management/Business Plans

This course will provide the necessary instruction to put together and implement a business plan for the farm business.

Student Learning Outcomes:

- * Determine what the goals of the business and family are for the future
- * Recognize the need to update and refine plan on a regular basis

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- * Implement their personal business plan
 - * Create a business plan for their business
 - * Determine the strengths and weaknesses of their business
 - * Develop a vision statement for the continuation of their business
 - * Develop a mission statement for their business
 - * Determine the elements of their business that need to be included in their plan
 - * Recognize what is needed to create a business plan
- (3 C: 0 lect/pres, 0 lab, 3 other)

FBMT 2950 - Directed Study - Decision Making

This course will examine the individual, family and farm business decision making process with emphasis on upgrading and improving decision making resources, tools and skills. Particularly, this course will lead the student to critically analyze information, applications and implications of decision making as it relates to their own situation. Students will evaluate their own decision making process.

Student Learning Outcomes:

- * Implement the decision making process
- * Analyze errors in decision-making (detection and avoidance)
- * Evaluate decision-making traps (data vs. intuition)
- * Examine the role of predictions in the decision making process
- * Define the decision making process
- * Develop administrative skills as they relate to decision making
- * Develop analytical and action based decision-making skills
- * Develop team/project management skills for the decision making process
- * Apply decision making tools and techniques developed in diploma and certificate programs

(2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2951 - Directed Study - Communications

This course will assist the student in further acquiring and developing a higher level of communications skills. Students will review and evaluate various communication methods and techniques in dealing with and relating to individuals in both the public and private sectors. Students will use this information in formulating an effective communication method and style. Additional course content may include student initiated or group activities.

Student Learning Outcomes:

- * Explore and develop means of focusing upon crisis communication techniques
- * Define methods of consumer education techniques
- * Explore and develop public and community relation methods
- * Interpret advantages/disadvantages of various communication methods
- * Define and apply methods and mechanisms of communication
- * Develop administrative skills
- * Develop improved written and oral presentation skills
- * Develop team/project management skills
- * Apply communication tools and techniques developed in the diploma programs

(2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2952 - Directed Studies in Modern Agricultural Technology

This course will deal with experiencing modern agricultural technological changes and determining if they fit into an individual's farming operation.

Student Learning Outcomes:

- * Lay out an application plan for integrating ag technology into the farming operational goals
- * Determine the advantages and disadvantages of the application of ag technology into the business
- * Investigate the feasibility of the application of technology into the business
- * Examine emerging agricultural technology
- * Promote administrative skills
- * Improve written and oral presentation skills
- * Develop team and/or project management skills
- * Apply tools and techniques developed in diploma and certificate programs

(2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2953 - Directed Studies in Farm Business and/or Family Transition

This course will focus on the many methods of farm business and/or family transition problems confronted during transition, family and/or transition needs and concerns, how to plan for farm business and/or family transition, and actually

implementing a farm business and/or family transition plan.

Student Learning Outcomes:

- * Layout and implement a family transition plan to address needs, concerns and goals
- * Analyze strategies for retirement planning as a part of family transition
- * Classify various farm business structures and how they vary during family transition
- * Distinguish farm business transfer strategies
- * Identify family and/or individual transition needs and concerns
- * Promote administrative skills
- * Improve written and oral presentation skills
- * Develop team and/or project management skills
- * Apply tools and techniques developed in diploma and certificate programs

(2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2954 - Directed Study - Personnel Management

This course will organize skills for effective management of farm employees and agribusiness personnel through development of; handbooks, compensation/incentive packages, individual expectations/evaluations, and team meetings.

Student Learning Outcomes:

- * Determine methods for evaluating yourself as a manager of employees and consultants
- * Conduct team meetings to diagnose and recommend treatment of business needs
- * Diagram a team concept/approach for determining business needs
- * Organize essential features for effective employee meetings
- * Develop employee handbooks specific to the farm business
- * Determine a procedure for enhancing employee skills through education and training
- * Develop methods of employee motivation
- * Develop written guidelines for employee evaluation
- * Outline complete job descriptions for each employee of the farm business
- * Develop employee compensation and incentive packages with guidelines for periodic review
- * Conduct interviews with prospective employees
- * Apply tools and techniques developed in diploma or certificate programs

(2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2955 - Directed Study - Enterprise Alternatives

This course will assist those students wanting to make changes in their farm business through enterprise expansion, addition or enhancement. The course will develop a set of procedures for exploring and evaluating alternative choices.

Student Learning Outcomes:

- * Compose written and oral presentations to promote alternative plans
- * Select alternatives best suited to personnel and other resources available
- * Prioritize criteria that affect implementation of alternatives
- * Compare industry standards to local standards and personal accomplishments
- * Evaluate industry standards for alternatives
- * Determine interviewing techniques needed to evaluate enterprise alternatives
- * Conduct team meetings to evaluate information for enterprise alternatives
- * Develop team/project skills and procedures needed to assess alternatives
- * Compare and contrast alternatives available; new, value added, expansion
- * Apply tools and techniques developed in diploma and certificate programs

(2 C: 0 lect/pres, 0 lab, 2 other)

FNCR 1200 - Personal Money Management

This course provides instruction in financial management involving maintaining financial records (balance sheet and income statement), budgeting, banking services, credit card use, major expenditure decisions, income and asset protection, and investment planning.

Student Learning Outcomes:

- * Explain the concept of financial planning, its components, and its benefits
- * Compare and contrast installment and non-installment credit including the cost of credit and the reasons for and against credit
- * Discuss the principles of wise purchasing (costs, decision-making concerns, etc.) as it applies to vehicles, homes, and other major purchases
- * Describe and discuss the following topics: reasons for investing, the variety of investments available, major factors that affect the return and portfolio management for long-term investors

(3 C: 3 lect/pres, 0 lab, 0 other)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

FNCR 1220 - Principles of Banking

A history of banking and the current banking industry is examined. The focus centers on the main functions of banking and the products and services offered by the banking industry.

Student Learning Outcomes:

- * Describe the three functions of banking and the customer and financial services provided by banks
 - * Describe the problems of early banking and how (through legislation) the problems were resolved
 - * Describe the structure of the Federal Reserve System and how it works with regard to fiscal and monetary policies
 - * Define and discuss the deposit, payment, and credit functions of banking
 - * Identify the four basic categories of loans and explain the credit analysis process for individual and business loans
 - * Define credit risk, market risk, spacing of maturities, and diversification of investments
 - * Discuss marketing research in meeting the needs of banking customers
 - * Describe the financial planning and budgeting process, and the importance of accurate accounting data
 - * Describe how banking operations have changed as technology and customer expectations have changed
- (3 C: 3 lect/pres, 0 lab, 0 other)

FNCR 1250 - Credit Law

This course pairs and expands upon the legal environment of business course in the business and finance and credit programs. The course focuses more in-depth on the legal principles applied to commercial transactions including, negotiable instruments, debtor-creditor relationships, agency, employment and bankruptcy laws, business organizations and government regulations. This focused attention on commercial transactions builds a more comprehensive understanding of the financial environment adding to the applied knowledge and skill set students need for employment in the finance and credit field.

Student Learning Outcomes:

- * Define and describe the legal principles applied to business transactions.
 - * Research current and emerging consumer rights and protection laws and policies.
 - * Demonstrate knowledge of commercial transactions including negotiable instruments, creditor remedies, and bankruptcy.
 - * Explain the laws affecting real and personal property in terms of buying, selling, owning, and leasing.
 - * Explain insurance contracts for different applications and the common components of all insurance contracts.
 - * Compare and contrast business organization options (Sole Proprietorship, Partnership, Corporation and Limited Liability Company) and the effect on contract rights and duties.
 - * Examine the government regulatory environment as it applies to agency and employment laws that impact the finance and credit industry.
 - * Understand the way the legal environment views financial circumstances and how to apply this knowledge to influence and make informed business decisions.
 - * Apply research and historical knowledge to foresee and avoid legal difficulties in the business environment.
 - * Identify legal issues in finance and credit related scenarios and apply knowledge of the credit law environment to resolve.
 - * Learn to develop acceptable attitudes and viewpoints with respect to business ethics and social responsibility within the realms of commercial and/or credit transactions.
- (3 C: 3 lect/pres, 0 lab, 0 other)

FNCR 1260 - Risk Management and Commercial Real Estate

Risk management and commercial real estate will prepare students to understand, evaluate and take action on all risks with the goal of increasing the probability of success and reducing the likelihood of failure. This course examines those two topics including assessing business risks and the tools used as part of a risk management plan designed to eliminate, minimize and/or transfer those risks. The commercial real estate topic includes terminology, the advantages and disadvantages of buying versus leasing, preferred leasing contract terms, and the restrictions of zoning laws.

Student Learning Outcomes:

- * Research and understand the legal environment surrounding risk management

and commercial real estate to ensure compliance at the local, state and federal level.

- * Identify common business risks to create a risk management plan.
 - * Comprehend the role of insurance and apply to risk management strategies.
 - * Research and comprehend the role of mitigation in credit underwriting and accounts receivable management.
 - * Apply appropriate risk management tools to a variety of business scenarios.
 - * Develop a risk management plan.
 - * Demonstrate knowledge and application of commercial real estate terminology.
 - * Explain the advantages and disadvantages of leasing/buying commercial real estate.
 - * Determine the preferable content when negotiating the terms of a commercial lease.
 - * Explain the impact of zoning laws and restrictions on commercial real estate.
- (3 C: 3 lect/pres, 0 lab, 0 other)

FNCR 2245 - Consumer Lending

Students will study the essential concepts needed to understand the consumer loan function, including a history of consumer credit, evaluation of credit risks, and the gathering, investigating, and analysis of credit information. Students will also study procedures involved in documenting, servicing, managing, pricing and marketing flows. Practical examples of loan costs and pricing are provided along with discussion of different loan products, delivery channels, marketing, and sales.

Student Learning Outcomes:

- * Describe the evolution of consumer credit in the United States and trace the development of current lending practices and attitudes
 - * Describe key laws or regulations affecting consumer lending
 - * List characteristics, benefits, and disadvantages of direct lending
 - * Explain the advantages and disadvantages of indirect lending from the bank's, the dealer's, and the consumer's perspective
 - * State the objectives of the loan application generating process and give examples of how the effective marketing of loan products can increase outstanding loans and application volume
 - * Describe the primary sources of consumer loan information and the steps taken in the credit verification process
 - * Explain how the five C's of credit are used in credit evaluation and decision making
 - * List the objectives for the bank's formal loan policy statement
- (3 C: 3 lect/pres, 0 lab, 0 other)

FNCR 2275 - Internship

This course will be available to students who have successfully completed 90% of the program requirements. This is a capstone course for the program providing students with an opportunity to demonstrate mastery of program outcomes needed for the internship as determined by the student's internship site supervisor.

Student Learning Outcomes:

- * Maintain satisfactory attendance on the job
 - * Perform job skills and tasks satisfactorily
 - * Display honesty and courtesy
 - * Communicate effectively with associates and customers
 - * Conform to all rules and regulations of employer and industry
 - * Maintain confidentiality of all business transacted with customers
 - * Provide required feedback including written evaluations of the student's progress completed by the student and employer at the expiration of the internship period
- (3 C: 0 lect/pres, 0 lab, 3 other)

GBEH 1100 - Human Relations

This is a practical course in human interaction in the workplace. The course presents and practices skills that increase effectiveness and harmony in the workplace. These skills include effective communication in speaking and listening and awareness and understanding of various differences which affect human interaction. These include differences in culture, beliefs, traditions, socio-economic status and education. The course examines those situations and opportunities which arise in the workplace and challenge cooperation, patience, sensitivity, and courtesy.

Student Learning Outcomes:

- * Apply varied communication skills and strategies to improve interpersonal

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communication.

- * Analyze the origins of attitudes, values and beliefs.
 - * Understand issues of diversity and social justice, especially as these affect the workplace.
 - * Apply ethical standards to personal and occupational situations.
 - * Apply critical thinking skills to achieve clarity, accuracy, precision, depth, and fair-mindedness in reading, speaking, writing, and listening in the Human Relations discipline.
 - * Evaluate the effects of attitudes, values, and beliefs on human relationships in the workplace.
 - * Evaluate the effects of cultural change on human relationships in the workplace.
 - * Understand the impact of human relations skills on an individual's ability to function effectively and ethically in social, institutional and cultural contexts.
 - * Apply teamwork theory and skills to occupational situations.
- Prerequisite(s): ENGL0900 and READ0900 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

GBUS 1320 - Professional Development I

This course will help students develop team building skills, leadership skills, enhance their personal and professional confidence.

Student Learning Outcomes:

- * Participate in activities to increase their professional development
- * Apply leadership skills outside of class situations
- * Develop professional contacts
- * Experience group and team dynamics

(1 C: 1 lect/pres, 0 lab, 0 other)

GBUS 1324 - Professional Development II

This course will introduce students to total quality management, team building and networking skills. Students will explore their humanitarian responsibility, personal accountability and develop organizational and management skills.

Student Learning Outcomes:

- * Participate in team activities to increase their ability to perform as a team member. Activities include: fundraising, attending meetings, Parade of Homes, Home Shows, goal setting, and Internet search

(1 C: 1 lect/pres, 0 lab, 0 other)

GBUS 1328 - Professional Development III

This course will help the student use individual and team skills in various meetings and community activities. The Spring or Fall Home Shows, Parade of Homes, and business tours would be included.

Student Learning Outcomes:

- * Participate in monthly meetings at SCTCC, Parade of Homes, Home Shows, and two local businesses

Prerequisite(s): GBUS1320, GBUS1324. (1 C: 1 lect/pres, 0 lab, 0 other)

GEOG 1300 - World Regional Geography

Meets MN Transfer Goals 5 and 8 - History/Social, Behavioral Sciences and Global Perspectives. A survey of the physical, cultural, economic and political features of the world's geographic regions. Identification of world's countries and major cities.

Student Learning Outcomes:

- * Acquire an increased awareness and knowledge of the interconnectivity of the world
- * Gain background for analyzing and comparing cultural elements
- * Acquire geographic information from maps, globes, charts and other graphic material
- * Increase spatial analysis skills from the use of maps, globes, charts and other graphic material
- * Understand key concepts, generalizations and methods of inquiry appropriate to the study of geography
- * Distinguish worldwide spatial distributions of landforms, climate, natural resources, demographic, cultural, economic and political attributes
- * Understand the relationships between human characteristics and locations
- * Be familiar with the locations of countries, major cities, landforms, climate types and cultures

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

GEOL 1300 - Geology

Meets MN Transfer Goal 3 - Natural Sciences. Earth is a very small part of a vast universe, but it is our home. Learn about the resources that support our modern society and the ingredients necessary to maintain life. This is an introductory course in Physical Geology designed for non-science majors. The course includes a laboratory component. The focus of the course is to gain an understanding of the basic geological formations and processes that shape our earth. Topics will include; Minerals, Rock Types, The Rock Cycle, Volcanoes, Erosion, Ground Water, Glaciers, Deserts, Shorelines, Plate Tectonics, Earthquakes, Mountain Formation, and Geologic Time.

Student Learning Outcomes:

- * Describe how scientists determine the properties of geological formations and materials
- * Identify basic minerals and rock types, their sources, and their properties
- * Describe and explain the major geological processes that shape the earth
- * Describe geologic time and the earth's evolution through geologic time
- * Apply theoretical geologic processes to current phenomena and explain their causes
- * Describe local landforms and explain their formation
- * Perform measurements and analysis of the properties of earth's materials
- * Document and discuss experimental results
- * Gather and analyze data and draw conclusions from this analysis
- * Demonstrate and apply critical thinking skills to analyze a variety of geological phenomena
- * Work cooperatively and effectively in groups engaged in the process of science and show respect for other people's needs, ideas, and feelings
- * Model professional and responsible behavior by being on time, participating in class discussions and completing assignments on time
- * Demonstrate effective use of resources including faculty, other students, reference materials, industry sources, and the Internet

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(4 C: 3 lect/pres, 1 lab, 0 other)

GERO 1300 - Introduction to Gerontology

Meets MN Transfer Curriculum Goal Areas 5 and 7 - History/Social, Behavioral Sciences and Human Diversity. This course explores the biological, social, psychological and economic changes that accompany the aging process. Students will explore societal factors affecting resources available to the older adults and possible roles they might fill as family members or professionals caring for the older adults. Throughout the course, we will look carefully at variations in aging and caregiving experiences by race, ethnicity, class, gender, age, and sexualities.

Student Learning Outcomes:

- * Examine the biological, social, psychological, economic, and political aspects of aging using multidisciplinary perspectives.
- * Evaluate methods and theories used by gerontologists to study aging.
- * Analyze who/where the older adults are through an examination of demographic data, historical and current.
- * Identify the impact of the older adults within the family structure and in communities, as well as advocacy roles that family member and professionals can serve.
- * Analyze the social, interpersonal and cultural stereotypes/biases about aging and develop an attitude that values the older adults.
- * Critique the impact of public policy and the availability of community resources for the older adults.
- * Analyze the intersectionality of age, race, ethnicity, sex, gender, sexualities, and class.
- * Apply gerontological concepts and theories by using them to solve institutional problems and/or address challenges involving aging.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

GTEC 1304 - The Automobile in America

Explore the history and future of the automobile and its impact on labor, culture, society, the environment, and the economy of the United States. Analyze the effect of the automobile on your present and future lifestyles.

Student Learning Outcomes:

- * Discuss the impact of the automobile on American culture, society and the economy throughout its history
- * Compare and contrast the effects of World Wars I and II, The Depression, The

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Industrial Revolution, the GI Bill, and "Baby Boom" generation on the consumer and automobile industry

- * Discuss the history and future impact of the energy crisis, European and Asian Imports, and environmental impact of the automobile on consumers and automobile manufacturers
- * Compare and contrast the attitudes of automobile manufacturers and consumers toward improvements in automobile safety throughout the history of the automobile
- * Research from manufacturer's brochures, automotive and consumer's journals and the Internet to determine quality, safety, ergonomics, pricing, and overall value of automobiles and light trucks
- * Compare and contrast the changing attitudes of labor and management and the role of the United Auto Workers throughout the history of automobile production
- * Discuss the history of minorities and women as labor in automobile production
- * Compare the portrayal of women and minorities in marketing and commercials for automobiles throughout history
- * Describe the changes in automobile production and marketing and the impact on consumers and manufacturers as the industry moves toward a greater global enterprise
- * Compare and contrast styling and design changes of the automobile and their impact on consumers throughout automotive history
- * Compare and contrast the design, production, and marketing of Ford's Model T, the Volkswagen Beetle, the Austin Mini, and Chrysler minivans
(3 C: 3 lect/pres, 0 lab, 0 other)

HART 1502 - Copper and Gas Piping

In this course students will learn to solder, braze, swage and flare copper tubing as used in the HART field. Students will also learn how to cut, deburr, and thread gas piping for the HART field.

Student Learning Outcomes:

- * Demonstrate soldering, and brazing of copper tubing
- * Demonstrate swaging, and flaring of copper tubing
- * Demonstrate proper techniques of bending copper tubing
- * Demonstrate cutting, deburring, and threading of gas pipe
(1 C: 0 lect/pres, 1 lab, 0 other)

HART 1506 - Schematics and Blue Print Reading

In this course students will study, draw and read wiring schematics so they can properly analyze electrical problems in furnaces and air conditioners. Students will also learn to read blueprints to properly size furnace and air conditioners for residential homes.

Student Learning Outcomes:

- * Read wiring schematics for residential furnaces and a/c
- * Draw wiring schematics for residential furnaces and a/c
- * Read and understand blueprints for heating and a/c
- * Properly size furnaces for residential homes
- * Properly size a/c for residential homes
- * Estimate the air flow room-by-room in residential homes
Prerequisite(s): HART1514, HART1518.
(3 C: 2 lect/pres, 1 lab, 0 other)

HART 1510 - Sheetmetal

This course will enable you to use sheet metal hand tools, squaring sheer and brake to make simple sheetmetal fittings. Students will lay out and make many different sheetmetal projects in residential heating and air conditioning.

Student Learning Outcomes:

- * Construct duct work
- * Layout sheetmetal elbows
- * Assemble sheetmetal duct work
- * Operate squaring shears and sheetmetal break
(1 C: 0 lect/pres, 1 lab, 0 other)

HART 1514 - Forced Air Heating

In this course you will study different types of residential furnaces, gas and fuel oil. The function of each component and how they operate together to make the furnace safe and function properly to heat your home.

Student Learning Outcomes:

- * Identify and describe each of the major components of the heat producing and

the heated air distribution sections of a forced air furnace

- * Check and set the proper pressures for L.P. Natural gas and fuel oil coming into furnaces and at the burners
- * Identify and test the operation of all line and low-voltage components of a residential forced air-heating systems
- * Properly test and set the efficiency of a residential forced air-heating system
- * Test for CO in residential forced air-heating systems
- * Calculate sensible heat in BTU's and CFM's
(5 C: 3 lect/pres, 2 lab, 0 other)

HART 1518 - Electrical Controls for Heating and A/C

This course will start out with the fundamentals of electricity and take you through the safety and operative controls in residential heating and a/c. You will learn how they operate, what they control, and what the controls are protecting and how they are protecting the unit, device or structure.

Student Learning Outcomes:

- * Define ohms, volts, and amps and show proper use of a VOM
- * Define series and parallel circuits
- * Read and draw basic schematic diagram of a heating and air conditioning system
- * Understand the function and operation of electrical components used in residential heating and a/c units
(4 C: 2 lect/pres, 2 lab, 0 other)

HART 1522 - Installation of Heating and A/C

This course will enable you to install furnaces and A/C in residential houses. It also includes gas piping standard and two pound systems. Also the proper venting of standard and high efficiency furnaces. You will be able to correctly install evaporators and condensing units for central A/C.

Student Learning Outcomes:

- * Install condensing units for central a/c in residential houses
- * Install evaporators for central a/c in residential houses
- * Install standard and high efficient furnaces
- * Install venting for standard and high efficient furnaces
- * Install air-to-air heat exchangers
- * Install gas piping for 1/2 lbs and 2 lbs residential systems
Prerequisite(s): HART1502, HART1510, HART1514, HART1518.
(3 C: 2 lect/pres, 1 lab, 0 other)

HART 1526 - Principles of Air Conditioning

In this course you will be introduced to refrigeration systems used in air conditioning. You will also learn the function of the four basic components of the a/c, evaporator, condenser, compressor and metering devices. Also charging, evacuating and reclaiming residential a/c systems.

Student Learning Outcomes:

- * Identify the four basic components of a refrigeration system used in residential a/c
- * Understand the functions of the four basic components of a refrigeration system used in residential a/c
- * Charge a residential a/c system
- * Evacuate a residential a/c system
- * Reclaim a residential a/c system
Prerequisite(s): HART1514, HART1518. (4 C: 2 lect/pres, 2 lab, 0 other)

HART 1530 - Heat Pumps

In this course you will study fundamentals of heat pump as applied to both heating and a/c. Both air-to-air heat pump and ground source heat pumps and how each work.

Student Learning Outcomes:

- * Understand the operation of a heat pump in the cooling cycle
- * Understand the operation of a heat pump in the heating cycle
- * Understand the operation of a heat pump when it goes into a defrost cycle
- * charge a heat pump
- * Understand the function of a ground source heat pump and how it takes heat and gives heat to the ground
Prerequisite(s): HART1514, HART1518.
(2 C: 1 lect/pres, 1 lab, 0 other)

HART 1534 - Troubleshooting Heating and A/C

This course will enable you to diagnose malfunctions in residential heating and A/C systems by learning the proper troubleshooting techniques, repairing or replacing defective components.

Student Learning Outcomes:

- * Diagnose a/c systems for proper operation of the electrical system
- * Diagnose a/c systems for proper operation of the refrigeration system
- * Diagnose heating system for proper operation of the electrical system
- * Take combustion analysis and check the readings against standards of industry
- * Test and replace defective components in residential heating and a/c systems

Prerequisite(s): HART1514, HART1518.

(3 C: 1 lect/pres, 2 lab, 0 other)

HART 1538 - HART Job Preparation

This course is designed to prepare students for job seeking skills necessary to complete a resume and job interviews. This course will also cover customer relation and service order documentation skills as it relates to the HVAC industry.

Student Learning Outcomes:

- * Construct a completed resume
- * Create a plan for a job interview
- * Determine the proper information for service orders in repair calls in HVAC
- * Develop a plan for the importance of customer relations for HVAC
- * Respond to customer complaints related to A/C and heating equipment
- * Generate a material orders for HVAC construction jobs

Prerequisite(s): HART1502, HART1510, HART1514, HART1518.

(1 C: 1 lect/pres, 0 lab, 0 other)

HART 1540 - Internship - Residential

This course is designed to allow students to apply the knowledge and skills learned in the classroom and lab. Students will work for a residential heating and air conditioning company.

Student Learning Outcomes:

- * Understand the daily workings of a residential service or installation company
- * Identify the types of customers a residential company performs services for
- * Identify the procedures for documenting services performed for customers
- * Relate the professional approach between customer and service personnel
- * Identify the techniques and procedures used to perform service and installation of residential equipment

Prerequisite(s): HART1502, HART1510, HART1514, HART1518.

(2 C: 0 lect/pres, 0 lab, 2 other)

HART 2502 - Commercial Refrigeration II

Students will do an in depth study of commercial refrigeration systems and refrigeration controls. Students will perform control adjustments and installation.

Student Learning Outcomes:

- * Categorize types of supermarket refrigeration cases
- * Determine the piping schemes of heat reclaim systems
- * Determine the operation and controls of an ice machine by reading schematics
- * Demonstrate the operation and controls of a parallel refrigeration system
- * Classify the types of refrigeration systems
- * Determine the accessories and their location on a supermarket rack

Prerequisite(s): HART2510, HART2522, HART2506, HART2530.

(4 C: 2 lect/pres, 2 lab, 0 other)

HART 2506 - Commercial Refrigeration I

Students will study fundamental principles of commercial refrigeration. Students will study accessories and perform troubleshooting on commercial applications.

Student Learning Outcomes:

- * Determine the types and reasons for high side pressure control devices
- * Compare the laws of thermodynamics as they apply to refrigeration systems
- * Determine the proper procedures and requirements for converting CFC refrigerants to a HFC or HCFC refrigeration system
- * Determine the causes of low temperature systems failures
- * Determine and install appropriate refrigeration accessories based on system requirements

Prerequisite(s): HART1506, HART1522, HART1526, HART1530, HART1534.

(4 C: 2 lect/pres, 2 lab, 0 other)

HART 2510 - Commercial Electrical and Controls

Students will study the operation and troubleshooting of commercial electrical controls as they relate to commercial refrigeration, heating and air conditioning systems. Students will perform troubleshooting and installation of controls.

Student Learning Outcomes:

- * Classify all types of single phase and three phase power supplies, their correct voltages and wiring configuration
- * Determine the correct settings of operating and safety controls that are commonly associated with commercial refrigeration, heating and air conditioning equipment

* Conclude the operation of electrical controls and interpret their functions on electrical schematics

Prerequisite(s): HART1506, HART1522, HART1526, HART1530, HART1534.

(3 C: 2 lect/pres, 1 lab, 0 other)

HART 2514 - Compressor Operation and Troubleshooting

Students will study in-depth the operation and the troubleshooting skills for refrigeration and air conditioning compressors. Students will perform operational checks and teardown of compressors.

Student Learning Outcomes:

- * Classify the types of mechanical action used for compressors
- * Compare the types of compressor failures
- * Analyze the internal operation of a compressor for normal operation using the proper tools
- * Distinguish the types of compressor cooling
- * Demonstrate the removal and replacement of a failed compressor
- * Demonstrate the replacement of failed internal compressor valves

Prerequisite(s): HART2506, HART2510, HART2522, HART2530.

(3 C: 1 lect/pres, 2 lab, 0 other)

HART 2518 - Commercial Troubleshooting

Students will use knowledge and tools to troubleshoot commercial refrigeration, air conditioning and heating equipment. Students will use refrigeration theory and electrical diagrams to troubleshoot equipment.

Student Learning Outcomes:

- * Demonstrate the proper techniques to find power circuits shorts
- * Test for open safeties using hopscotch method of electrical troubleshooting
- * Determine system failures by understanding systems sequence of operation
- * Determine and identify mechanical failures of systems accessories

Prerequisite(s): HART2506, HART2510, HART2522, HART2530.

(2 C: 1 lect/pres, 1 lab, 0 other)

HART 2522 - Commercial Air Conditioning

Students will service and install commercial air conditioning systems. Students will do an in-depth study of controls and types of air conditioning systems as they relate to the commercial field.

Student Learning Outcomes:

- * Determine if an air conditioning system that is low on refrigerant, recover the refrigerant, repair the leak and properly recharge system
- * Analyze the operation capacity control devices, properly adjust, and troubleshoot each type of capacity control device
- * Demonstrate the ability to troubleshoot and repair or replace failed electrical components of commercial air conditioning systems
- * Evaluate the affects of commercial air conditioning systems on room comfort and system performance with the use of psychrometric charts
- * Analyze commercial air conditioning system failures and conclude the probable cause

Prerequisite(s): HART1522, HART1526, HART1530, HART1534, HART1506.

(3 C: 2 lect/pres, 1 lab, 0 other)

HART 2526 - Commercial Heating and HVAC Systems

Students will use their skills and knowledge to troubleshoot, perform maintenance and install commercial heating and HVAC systems. Students will do an in-depth study of controls and design of commercial heating and HVAC systems.

Student Learning Outcomes:

- * Take combustion analysis and check the readings against standards of industry
- * Determine components and operation of hot water heating systems
- * Examine the operation and recommended use of make-up air heating systems

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

- * Analyze drawings and duct layout to determine the types of air handling systems
 - * Determine the components and operation of steam heating systems
- Prerequisite(s): HART2506, HART2510, HART2522, HART2530.
(3 C: 2 lect/pres, 1 lab, 0 other)

HART 2530 - Commercial Load Calculating

Students will properly select the correct refrigeration equipment to load demands. Students will also determine the proper piping size and accessories for the equipment selected.

Student Learning Outcomes:

- * Determine the proper BTU loads for various sizes of walk-in coolers and freezers
 - * Calculate the amount of BTU's required for storage of various types of products
 - * Determine the proper refrigeration equipment and accessories for specified BTU loads
 - * Design properly functioning refrigeration systems, to include pipe size, layout and installation requirements
 - * Calculate BTU load of residential house, size and design ductwork layout
- Prerequisite(s): HART1534, HART1506, HART1522, HART1526, HART1530.
(2 C: 1 lect/pres, 1 lab, 0 other)

HART 2534 - Commercial HVAC Controls

Students will use their knowledge of commercial heating, air conditioning systems and ventilation to perform service, installation and maintenance on equipment. Students will study the design and controls of commercial HVAC equipment.

Student Learning Outcomes:

- * Determine the operation of a two position control system and proportional control system
 - * Determine the use and operation of limit controls
 - * Demonstrate basic operation of a digital control system
 - * Analyze pneumatic stats for proper calibration and operation
- Prerequisite(s): HART2506, HART2510, HART2522, HART2530.
(2 C: 1 lect/pres, 1 lab, 0 other)

HART 2540 - Internship - Commercial

This course is designed to allow students to apply the knowledge and skills learned in the classroom and lab. Students will work for commercial heating, air conditioning, and refrigeration companies.

Student Learning Outcomes:

- * Examine the daily workings of a commercial service or installation company
 - * Determine the types of customers a commercial company performs services for
 - * Identify the procedures for documenting services performed for customers
 - * Relate the professional approach between customer and service personnel
 - * Identify the techniques and procedures used to perform service and installation of commercial equipment
- Prerequisite(s): HART1506, HART1522, HART1526, HART1530, HART1534.
(2 C: 0 lect/pres, 0 lab, 2 other)

HASL 1300 - American Sign Language I

Meets MN Transfer Curriculum Goal Area 7 - Human Diversity. This course is an introduction to beginning ASL (American Sign Language) sign vocabulary. Students will learn grammatical features and classifiers with an emphasis on visual American Sign Language. This course is an immersion in ASL. It promotes an increased understanding and appreciation of Deaf culture.

Student Learning Outcomes:

- * Recognize the difference between affirmative and negative.
 - * Convert from yes/no questions to wh-word questions and vice-versa.
 - * Demonstrate directional verbs.
 - * Project sensitivity to cultural tips.
 - * Identify verb/noun pairs.
 - * Utilize negative incorporations.
 - * Respond to commands.
 - * Demonstrate respect for a no-sound environment.
 - * Describe Deaf Culture.
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

HASL 1404 - American Sign Language II

Review and expansion of basic vocabulary and grammatical structure, conversational practice. Must be taken in sequence.

Student Learning Outcomes:

- * Introduce the student to expansion of beginners' vocabulary of ASL
 - * Utilize American Sign Language and fingerspelling in both expressive and receptive ways with more facial expression and body movements
 - * Develop more active listening behaviors
 - * Participate fully in the classroom such as: small group work, group discussion, and whole class discussion
- Prerequisite(s): HASL1300.
(3 C: 3 lect/pres, 0 lab, 0 other)

HASL 1408 - American Sign Language III

Meets MN Transfer Goal 8 - Global Perspective. Continuation of American Sign Language expansion of intermediate vocabulary, grammar and visual language with increased speed and clarity of fingerspelling and signing.

Student Learning Outcomes:

- * Introduce the student to intermediate vocabulary of ASL
 - * Utilize American Sign Language fluently in both expressive and receptive ways
 - * Interact with deaf people and to understand their signing styles
 - * Know ethical dilemmas common in communicating
 - * Participate fully in the classroom such as: small group work, group discussion, and whole class discussion
 - * Increase signing and fingerspelling speed and clarity
- Prerequisite(s): HASL1404.
(3 C: 3 lect/pres, 0 lab, 0 other)

HASL 1412 - American Sign Language IV

Meets MN Transfer Goal 8 - Global Perspective. Intense study of intermediate + (or intermediate plus) vocabulary and ASL grammatical structures, in-depth descriptive classifiers, with few repetitions and students' self critique. Knowledge of political corrections signs. Primarily for intermediate sign language students.

Student Learning Outcomes:

- * Introduce the student to intermediate vocabulary of ASL
 - * Utilize American Sign Language fluently in both expressive and receptive ways with few repetitions
 - * Interact with deaf people and recognize their signing styles
 - * Identify political corrections signs
 - * Participate fully in the classroom such as: small group work, group discussion, and whole class discussion
 - * Self-critique of signing and fingerspelling speed and clarity for self and others
 - * Utilize in-depth classifiers describing things, persons or places
- Prerequisite(s): HASL1408.
(3 C: 3 lect/pres, 0 lab, 0 other)

HIST 1310 - American History Until 1877

Meets MN Transfer Goals 5 and 9 - History and the Social and Behavioral Sciences and Ethical and Civic Responsibility. This course will examine major trends and events from the early European explorations until the Compromise of 1877. Topics will include historical methods, the indigenous peoples and their cultures, the European background, colonial government and culture, the Industrial Revolution, the American Revolution, establishment of the Constitution, the young republic, territorial expansion, slavery, immigration, sectional divisions, the Civil War, and Reconstruction of the South.

Student Learning Outcomes:

- * Acquire basic knowledge and understanding of American history until the end of Reconstruction, including but not limited to the topics mentioned in the description
 - * Gain appreciation for the ways the study of past is related to the contemporary situation
 - * Acquire a basic understanding of the discipline of history and historical knowledge
 - * Develop a greater interest and curiosity for the study of history
 - * Develop enhanced college-level skills in analysis, writing, research, and oral presentations
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

HIST 1311 - The United States Since 1877

Meets MN Transfer Goals 5 and 9 - History and the Social and Behavioral Sciences and Ethical and Civic Responsibility. This course will examine trends and events from the end of Reconstruction until the present, including topics such as industrial modernization, imperialism, Jim Crow, progressivism, the two world wars, the Great Depression, the New Deal, the Cold War, the Korean and Vietnam Wars, the Civil Rights movement, Great Society reforms, the impact of 9/11/01, America's changing role in the world, and continuing political controversies.

Student Learning Outcomes:

- * Acquire basic knowledge and understanding of American history since the end of Reconstruction, including but not limited to the topics mentioned in the description
- * Gain appreciation for the ways the study of past is related to the contemporary situation
- * Acquire a basic understanding of the discipline of history and historical knowledge
- * Develop greater interest and curiosity about the study of history
- * Develop enhanced college-level skills in analysis, writing, research, and oral presentations

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score. (3 C: 3 lect/pres, 0 lab, 0 other)

HIST 1320 - World History to 1500

Meets MN Transfer Curriculum Goal Areas 5 and 8 - History and the Social and Behavioral Sciences and Global Perspective. This survey course examines the history of major world civilizations from about 4000 BCE to 1500 CE. The course explores the history of the cultural, religious, economic, political, ecological and social aspects of the ancient civilizations of Mesopotamia, Egypt, Greece and Rome, the Islamic World, medieval Europe, West Africa, China, India, southeast Asia, Oceania, and the Pre-Columbian Americas.

Student Learning Outcomes:

- * Outline and describe the methods and data that historians use to investigate major world civilizations from the dawn of the historic age (ca. 4000 BCE) to 1500 CE.
- * Recognize and explain the key political, economic, and cultural trends in world civilizations from ca. 4000 BCE to 1500 CE.
- * Examine and interpret the major religious, artistic, social, economic, environmental and political trends of world civilizations from ca. 4000 BCE to 1500 CE.
- * Identify and summarize the cultural, social, religious and linguistic contributions of the various population groups that shaped world history from ca. 4000 BCE to 1500 CE.
- * Analyze specific historical international problems and critique the solutions utilized by and the alternatives available to major world population groups from ca. 4000 BCE to 1500 CE
- * Assess and evaluate the influence of historical civilizations on contemporary global issues and on modern world citizenship.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score. (3 C: 3 lect/pres, 0 lab, 0 other)

HIST 1330 - World War II

Meets MN Transfer Goals 5 and 8 - History and the Social and Behavioral Sciences and Global Perspective. This course describes and analyzes the most violent and destructive war in human history, including its causes, Fascism, the Third Reich, Soviet Communism, war aims of participating countries, campaigns and battles, strategies and tactics, technologies, political and military leadership, home fronts, diplomacy, genocide, final victory, trials for war crimes, and the consequences of the war on subsequent developments.

Student Learning Outcomes:

- * Acquire basic knowledge and understanding of the war, including the topics in the description
- * Gain appreciation for the ways the study of past is related to the contemporary situation
- * Acquire a basic understanding of the discipline of history and historical knowledge
- * Develop greater interest and curiosity about WW II and subsequent history
- * Gain enhanced college-level skills in analysis, writing, research, and oral presentations

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score. (3 C: 3 lect/pres, 0 lab, 0 other)

HIST 1340 - Contemporary World History

Meets MN Transfer Goals 5 and 8 - History and the Social and Behavioral Sciences and Global Perspective. This course provides an historical analysis of the contemporary world from the end of World War II until the present. Topics will include the consequences of the war, the Cold War, economic developments, ideologies, major leaders, cultural patterns, neo-imperialism, decolonization, U.S. foreign policies, human rights, the fall of European Communism, major military conflicts, and ethnic violence.

Student Learning Outcomes:

- * Acquire basic knowledge and understanding of global history since 1945, including the topics in the course description
- * Learn more about current events, political controversies, and international relations
- * Gain appreciation for the ways the study of recent past is related to the contemporary situation
- * Acquire a basic understanding of the discipline of history and historical knowledge
- * Gain increased curiosity about contemporary politics and culture
- * Develop enhanced college-level skills in analysis, writing, research and oral presentations

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score. (3 C: 3 lect/pres, 0 lab, 0 other)

HITM 1215 - Health Information Foundations

This course introduces the student to the health information management profession by covering topics fundamental to the field such as content, function, structure, and uses of health information. The course covers prominent healthcare data sets, their purpose and use, as well as typical departmental functions associated with managing health information. An introduction of clinical vocabularies and classification systems, as well as secondary data sources such as registries and indexes, are covered. Students will learn the history, organization, financing, and delivery of health care services in the United States along with an overview of legal health record and an introduction to EHR and PHR.

Students have the opportunity to virtually tour healthcare facilities as well as interact with healthcare professionals. Benefits of membership in a professional organization are discussed. Background checks will be completed as a prelude to internship. A professional portfolio is developed as part of this course.

Student Learning Outcomes:

- * Discuss the development of health information management as a profession and benefits of professional membership.
- * Identify and describe health care regulators, both voluntary and mandatory, and the regulations/standards related to health information.
- * Explain the uses and values of health records in paper or electronic format.
- * Describe the content of the health record in hospitals, ambulatory care, mental health, long term care, hospice, and home care.
- * Describe and apply various methods used for filing, storage, and retention through the use of document scanning experience.
- * Perform quantitative, qualitative, and statistical analysis of health records.
- * Perform case abstracting on patient records and construct MPI of hospital records.
- * Interview a health care professional.
- * Create a professional portfolio, including resume, cover letter, and thank you.
- * Research internship opportunities or future career positions.

(3 C: 3 lect/pres, 0 lab, 0 other)

HITM 1220 - Legal Aspects of Health Information

This course covers the application of ethical and legal principles and standards pertaining to the control and use of consent and release of Information forms in healthcare. Topics of study include an overview of the legal system, including professional liability and medical malpractice prevention. Students will apply regulations surrounding the Health Insurance Portability and Accountability Act, as well as documentation/retention guidelines, patient rights/physician duties, and bioethical practices. Application of regulations around healthcare are applied through the use of case studies.

Student Learning Outcomes:

- * Apply healthcare legal terminology.
- * Explain the trial process, including jurisdiction and levels of courts in the US.
- * Differentiate between civil law and criminal law.
- * Describe the difference between licensure and certification.

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* Apply medical ethics as relevant to patients, doctors, and the sustaining relationship, including professional duties and responsibilities of healthcare personnel.

* Apply legal concepts and principles to the practice of HIM, including implied and informed consent, professional liability, and medical malpractice.

* Discuss and adhere to various regulations affecting the medical profession, including Medical Staff Bylaws, Accreditation requirements, Agency regulations, State and Federal laws.

* Define and discuss the legal components of a medical record vs. legal record.

* Analyze ethical and bioethical issues relating to life using the ethical decision making model, and comply with ethical standards of practice.

* Apply HIPAA privacy and security standards surrounding issues of access and disclosure of patient information, patient rights, breach notification, and the penalties for noncompliance.

(3 C: 3 lect/pres, 0 lab, 0 other)

HITM 1226 - CPT Coding

The course introduces the basic principles, guidelines, and conventions of CPT coding. Coursework is organized by body system for application of appropriate CPT codes and reinforces knowledge of anatomy and medical terminology. Coursework includes classification and indexing of procedures and evaluation/management coding for the purposes of standardization, retrieval, and statistical analyses. Application of evaluation/management coding is reinforced through the use of case studies. Knowledge of CPT coding is critical as the student progresses into advanced coding classes.

Student Learning Outcomes:

* Identify the symbols used in the CPT codebook with 100% accuracy.

* Interpret and apply the information in section guidelines of the CPT codebook with a minimum of 80% accuracy.

* Classify E/M visit information and apply appropriate E/M visit codes based on the E/M guidelines with a minimum of 80% accuracy.

* Describe the history of the CPT classification system with 95% accuracy.

* Evaluate surgical clinical information for each body system and select the appropriate CPT code based on the surgical guidelines with a minimum of 80% accuracy.

* Evaluate radiology visit information and select the appropriate CPT code based on the radiology guidelines with a minimum of 80% accuracy.

* Evaluate anesthesia clinical information and select the appropriate CPT code based on the anesthesia guidelines with a minimum of 80% accuracy.

* Evaluate clinical information and select the appropriate Medicine CPT code based on the medicine guidelines with a minimum of 80% accuracy.

* Argue the selection of CPT code selection upon critical evaluation of the clinical information.

Corequisite(s): HITM1228

(3 C: 3 lect/pres, 0 lab, 0 other)

HITM 1227 - ICD-CM Coding

This course covers the basics of coding with the International Classification of Diseases-Clinical Modification (ICD-CM) coding system, including the basic principles, guidelines, and conventions of ICD-CM coding. Coursework includes classification and indexing of diagnoses and external causes for the purposes of standardization, retrieval, and statistical analysis. Coursework will include application of coding principles to sample patient health records and textbook case studies.

Student Learning Outcomes:

* Describe the history of classification systems, as well as current use and rationale for the ICD-CM classification system.

* Apply the appropriate conventions, guidelines and steps to coding ICD-CM codes.

* Evaluate diagnoses and select appropriate ICD-CM codes using the index to diseases and tabular list for infectious and parasitic diseases, neoplasms, all major body systems, symptoms, signs, and ill-defined conditions, injury and poisonings.

* Identify External Causes of Morbidity codes, and Factors Influencing Health Status and Contact with Health Service codes.

* Apply knowledge of medical terminology, anatomy and physiology of the human body while evaluating each ICD-CM code.

* Identify significant co-existing medical conditions and select the appropriate ICD-CM code(s) using the index to diseases and tabular list.

* Use coding resources, including Merck Manual or equivalent online resources

to argue the selection of ICD-CM code upon critical evaluation of the diagnostic information and define the selection based on medical necessity.

Prerequisite(s): HITM1228.

(3 C: 3 lect/pres, 0 lab, 0 other)

HITM 1228 - Administrative Medical Terminology

This is a basic medical vocabulary building course with emphasis on human anatomy, including terminology analysis and structure as related to the digestive, urinary, female and male reproductive, nervous, cardiovascular, respiratory, musculoskeletal, skin, and endocrine systems as well as cancer medicine with focus on spelling and pronunciation.

Student Learning Outcomes:

* Demonstrate knowledge of medical words as related to the following body systems: digestive, urinary, female and male reproductive, nervous, cardiovascular, respiratory, musculoskeletal, skin, and endocrine

* Demonstrate knowledge of medical words as related to common disease processes for the following body systems: digestive, urinary, female and male reproductive, nervous, cardiovascular, respiratory, musculoskeletal, skin, and endocrine

* Build medical terms for given definitions

* Define, pronounce, and spell disorder, surgical, and complementary terms for the following body systems: digestive, urinary, female and male reproductive, nervous, cardiovascular, respiratory, musculoskeletal, skin, and endocrine

* Spell medical words correctly as related to the following body systems: digestive, urinary, female and male reproductive, nervous, cardiovascular, respiratory, musculoskeletal, skin, and endocrine

* Given a medical term, diagnostic or radiological procedure, laboratory test or drug, demonstrate the ability to locate in the appropriate reference book

* Read medical documents and interpret medical terminology contained in them

* Interpret meanings of abbreviations as relevant to the following body systems: digestive, urinary, female and male reproductive, nervous, cardiovascular, respiratory, musculoskeletal, skin, and endocrine

(3 C: 3 lect/pres, 0 lab, 0 other)

HITM 1229 - Administrative Pharmacology

This course will introduce basic pharmacology concepts, such as drug terminology, abbreviations, drug effects, dosages and the use of drug reference books.

The course discusses commonly prescribed drugs and look alike/sound alike drug names. Medications used to treat specific diseases of the body will be identified.

Student Learning Outcomes:

* Explain roles of the medical/clerical positions related to pharmacology

* Define controlled substance and categories of controlled substances

* Identify drugs by trade name and generic name

* Describe drug by interactions with foods, beverages and other medications

* Define provided pharmacology prescription abbreviations. Explain apothecary unit abbreviations and proper use of punctuation rules

* Discuss medications used to treat disorders of the body systems

* Define antineoplastic medications and the difference between curative and palliative uses of chemotherapeutic agents

* Identify medications used to treat mental illnesses

* Discuss illegal drugs and prescription medications that may be misused or abused

* Review the impact of OTC nutritional supplements and their interactions with prescribed medications

(3 C: 3 lect/pres, 0 lab, 0 other)

HITM 1235 - ICD-PCS Coding

This course covers the basics of coding with the International Classification of Disease-Procedure Coding System (ICD-PCS) system. It introduces basic principle and guidelines of ICD-PCS coding. Coursework includes classification and indexing of procedures for the purpose of standardization, retrieval, and statistical analysis. Coursework will include application of coding principles to actual case scenarios, including specialty healthcare settings. Students will use encoding software within this course.

Student Learning Outcomes:

* Apply ICD-PCS official coding guidelines to coding scenarios.

* Identify necessary documentation required to code ICD-PCS.

* Identify specific coding requirements for specialty healthcare settings, including medical/surgical, obstetrics, osteopathic, chiropractic, nuclear medicine, rehabili-

tation, and mental health.

- * Analyze the impact of ICD-PCS on data management and related processes.
- * Apply knowledge of medical terminology and anatomy and physiology of the human body while evaluating ICD-PCS code selection.
- * Use coding resources, including coding software, to argue the selection of ICD-PCS code upon critical evaluation of the diagnostic and operative information.

Prerequisite(s): HITM1228.

(2 C: 2 lect/pres, 0 lab, 0 other)

HITM 1240 - Computerized Health Information

Course covers the basic concepts of an information system and the life cycle of information systems. The course also covers integration of clinical data from source applications in electronic health records (EHRs). Security measures to protect organization-wide information systems, measures to protect data integrity and validity are discussed. Students use an academic EHR system and an internet based EHR system to apply EHR functions.

Student Learning Outcomes:

- * Identify the initiatives and framework of the electronic health record, including supplemental technologies.
- * Demonstrate knowledge of inpatient clinical information systems, management support systems, and outpatient information systems.
- * Discuss the aspects of standardized healthcare data sets and standards in the electronic environment.
- * Participate in the planning, design, selection, implementation, integration, testing, evaluation, and support for organization-wide information systems.
- * Investigate the use of audit trails in EHRs.
- * Investigate the personal health record (PHR) and its integration into EHRs.
- * Experience an EHR environment by working within an academic EHR and an internet based EHR system, to enter and schedule patients and perform other actions within an EHR system.

(3 C: 3 lect/pres, 0 lab, 0 other)

HITM 1244 - Anatomy and Physiology for Health Information

The course introduces the basic structures of the human body from the cellular level, to the tissue level and finally to the organs comprising various systems of the body. Cell metabolism and reproduction will be investigated. The following body systems will be studied: integumentary, skeletal, articular, muscular, nervous, endocrine, blood, cardiovascular, lymphatic, digestive, respiratory, urinary and reproductive.

Student Learning Outcomes:

- * Define the anatomical and physiological terms associated with each system of the body.
- * Identify the basic structures of the human body.
- * Describe the function of each system of the body.
- * Differentiate between normal functions and disease of each system of the body.
- * Analyze the effects of aging on each system of the body.
- * Categorize information in case studies of each body system and prepare answers to case study questions.

Prerequisite(s): HITM1228.

(4 C: 4 lect/pres, 0 lab, 0 other)

HITM 1250 - Data and Software Applications for HIT

The course provides students with health information applications using Microsoft Word, Excel, and Access. Students will construct and analyze data using Excel function to include data sorting filtering, pivot tables, data validation, reports by subtotals, and other methods to extract information from data. Data abstraction will include pivot table description of post-procedural infections versus specific procedures to include bypass, resections, biopsies and other health care procedures. Students will differentiate among the various graphic functions to depict data efficiently and effectively. Student will use Microsoft Access to build table relationships among patient and physician data.

Student Learning Outcomes:

- * Classify data and information standards, including standards for hospital patient information, emergency room standards, ambulatory care standards and other standards required for patient information.
- * Summarize data using data capture tools and techniques including sorting, reports by subtotals and pivot tables. Students will summarize physician, diagnosis and procedure characteristics.

* Convert summarized data and display using appropriate graphic representations.

* Apply appropriate data stewardship and data governance to data and information.

* Demonstrate the use of data dictionary elements using Microsoft Access.

* Use software applications to build databases employing the elements of data standards, security and integrity when creating databases.

* Demonstrate a conceptual and practical understanding of data warehousing and data validity as applicable to software and hardware.

* Abstract data from secondary databases and critically evaluate abstracted data as to relevance and significance of the data.

(3 C: 3 lect/pres, 0 lab, 0 other)

HITM 2204 - Administrative Pathophysiology

This course will provide students with the basic concepts related to diseases and disorders of the human body. Focus will be on the nature, causation, diagnostic procedures and treatment of common diseases relating to infection and genetics in body systems. Knowledge of pathophysiology is crucial as the student progresses to advanced coding classes.

Student Learning Outcomes:

- * Investigate the mechanism of diseases.
- * Determine how and why alterations in body structure and function lead to the signs and symptoms of disease.
- * Determine the affects the immune system has in the disease process.
- * Apply knowledge to diagnose diseases based on symptoms.
- * Identify the various risk factors contributing to diseases.
- * Discriminate between the etiology and pathology associated with common diseases.
- * Review diagnostic tests for disease processes.
- * Compare treatment modalities, including surgical intervention, immunotherapy, and radiological techniques for specific conditions.
- * Apply medical terminology to diseases, injuries, and abnormalities of the human body.
- * Recognize the latest treatments for diseases and disorders.
- * Design a family tree to further understand how genetics play a role in many common disorders
- * Research and present findings on the etiology, signs/symptoms, risk factors, diagnostic tests, statistics, treatment and prognosis of a select disease.

Prerequisite(s): HITM1244.

(3 C: 3 lect/pres, 0 lab, 0 other)

HITM 2209 - HIT Professional Practice Experience I

This course prepares students for entry into the health information management field, offering an applied application of day-to-day tasks, policies and procedures related to Health Information. Students will interact with the Professional Practice Experience (PPE) supervisor and staff in the Health Information department during the practice experience. The course also offers PPE activities to prepare for and simulate on-the-job tasks. This is the first of two capstone courses for this program, and should be completed after completing the first year of the Health Information Technology program.

Student Learning Outcomes:

- * Create a cover letter, resume and thank you letter specific to internship.
- * Apply soft skill sets with a balance of confidence and humility.
- * Demonstrate networking skills when interacting with health information professionals.
- * Demonstrate accurate Health Information Technology functions.
- * Demonstrate responsibility for HIT job functions, computer knowledge, and professional behavior while at the Professional Practice Experience (PPE) facility.
- * Maintain the accuracy and completeness of the patient record under PPE supervision.
- * Apply safety, confidentiality, ethical standards and security guidelines of the PPE facility.
- * Demonstrate teamwork while working with a variety Health Information Technology departments at the PPE facility.
- * Prioritize job functions and activities under PPE Supervision.
- * Demonstrate ability to perform most HIT functions under PPE supervision.

(2 C: 0 lect/pres, 0 lab, 2 other)

HITM 2210 - Medical Billing and Reimbursement

This course provides a study of numerous health insurance plans, reimbursement methodologies and compliance strategies. Students will adhere to current regulations and guidelines for coding assignment. Students will also use electronic applications and work processes to support clinical classification coding.

Student Learning Outcomes:

- * Distinguish how different prospective payment systems operate (I.D.2)
- * Compare the purpose and benefits of different government-sponsored health programs (I.D.2)
- * Differentiate between types of fee-for-service reimbursement methods (I.D.1)
- * Analyze inpatient and outpatient prospective payment systems (I.D.1)
- * Interpret chargemaster information and use (I.D.3)
- * Evaluate the accuracy of diagnostic/procedural groupings (I.D.6)
- * Evaluate medical necessity via abstraction of source documents (I.D.6)
- * Gain experience in the use of automated encoder and grouper software (I.D.6)
- * Utilize current coding and reimbursement guidelines (I.D.4)

(3 C: 3 lect/pres, 0 lab, 0 other)

HITM 2211 - HIT Professional Practice Experience II

This course prepares students for entry into the health information management field, offering students interaction with the Professional Practice Experience (PPE) supervisor and staff in the Health Information department during the practice experience. This is the second of two capstone courses for this program, and should be completed during their second year in the Health Information Technology program.

Student Learning Outcomes:

- * Apply soft skill sets with a balance of confidence and humility.
- * Demonstrate responsibility for HIT job functions, computer knowledge, and professional behavior while at the Professional Practice Experience (PPE) facility.
- * Maintain the accuracy and completeness of the patient record under PPE supervision.
- * Apply safety, confidentiality, ethical standards and security guidelines of the PPE facility.
- * Demonstrate teamwork while working with a variety Health Information Technology departments at the PPE facility.
- * Prioritize job functions and activities under PPE Supervision.
- * Demonstrate ability to perform most HIT functions under PPE supervision.

(1 C: 0 lect/pres, 0 lab, 1 other)

HITM 2212 - Quality Improvement and Healthcare Statistics

This course covers the components of quality improvement models using practical tools for problem solving, decision making, time management, and implementation. Activities include review and evaluation of healthcare services with attention to utilization review and risk management. This course also covers collecting, analyzing, interpreting, and presenting numerical data relating to healthcare services.

Student Learning Outcomes:

- * Define differences in performance improvement models.
- * Compare performance improvement standards from various healthcare organizations.
- * Define a sentinel event vs. near-miss and their impact on risk management.
- * Discuss the importance of accrediting bodies.
- * Explain critical care pathways and their impact on quality healthcare.
- * Summarize the impact of quality outcomes on cost-effective healthcare.
- * Discuss and apply the selection of data collection tools.
- * Create a storyboard to portray data and outcomes of a performance improvement study.
- * Compute and apply commonly-used healthcare statistics.
- * Define how healthcare statistics are used in connection with healthcare quality outcomes.
- * Define minimum data set criteria and its impact on quality of care.
- * Explain basic research principles, including IRB policies and procedures.

(3 C: 3 lect/pres, 0 lab, 0 other)

HITM 2215 - HIT Management and Supervision

This class examines the many aspects of management of health information services. It introduces the general principles of management. Leadership theory and change management are examined. Work design and performance improvement

specific to the HIM field are discussed. Human resource management concepts including position descriptions, performance standards, interview techniques, building effective teamwork, staff training and development, laws affecting organization workforce, financial management functions of HIM profession are introduced. The steps and scope of project management are discussed. HIM strategic management processes are explored.

Student Learning Outcomes:

- * Describe management discipline, trends in managerial models, change drivers and roles of a manager.
- * Investigate strategic management processes as applicable to the HIM profession.
- * Describe the functions of leadership with stages and impact of organizational change.
- * Summarize and apply steps of systems analysis and design process to work flow design and performance improvement.
- * Develop policies, procedures, and identify areas of improvement based on HIM functions. (I.A.3)
- * Identify key activities associated with human resource management.
- * Understand and apply the continuum of employee training and prepare training/development plan relative to HIM department by the student presenting a continuing education topic to the class.
- * Describe and apply financial management functions of HIM professionals through the review of chargemaster and compilation of an HIM departmental budget.
- * Describe and apply the elements of project management, including the use of software for data collection, data storage and data reporting through the creation of a final project consisting of creating a professional state conference. (IV.A.1)

(3 C: 3 lect/pres, 0 lab, 0 other)

HITM 2224 - Advanced Medical Coding

In this course, students continue using the principles and guidelines of CPT and ICD-10-CM coding to correctly code healthcare case scenarios. Students integrate the coding knowledge from CPT and ICD-10-CM coding to assign both diagnostic and procedural codes from clinical source documents. The course provides complex cases to allow the student to coordinate the various classification systems needed to code visits to outpatient settings of clinics and hospital outpatient departments across all major specialties. Students will use an electronic application (encoder application software) as an aid in the selection of appropriate codes. The course will ready the student for the coding portion of the certification process.

Student Learning Outcomes:

- * Apply classification system codes to outpatient services, procedures, and visits.
- * Abstract information from clinical documentation to apply appropriate evaluation and management codes for these services.
- * Extrapolate pertinent information from clinical documentation relevant to assigning appropriate diagnostic and procedural medical codes.
- * Apply medical terminology pertaining to disease, injuries and abnormalities of the human body.
- * Discriminate between third party payer differences and apply coding guidelines to analyze and rework claim denials.
- * Argue the selection of medical codes upon critical evaluation of the diagnostic information.
- * Apply appropriate modifiers to the code selection.
- * Verify the completeness of data and data sources for the billing process.
- * Gain experience in the use of automated encoder and grouper software.

Prerequisite(s): HITM1226, HITM1227, HITM1244.

(3 C: 3 lect/pres, 0 lab, 0 other)

HITM 2244 - HIT Comprehensive Review

The course will provide study tips, comprehensive list of useful resources, review questions within the course content areas, and practice examination questions.

Student Learning Outcomes:

- * Prepare students for the comprehensive examination or the AHIMA (RHIT) examination
- * Take a comprehensive examination to assess student comprehensive learning in the HIT program

(1 C: 1 lect/pres, 0 lab, 0 other)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

HLTH 1402 - Nursing Assistant

The student will be introduced to concepts of basic human needs for a variety of populations with emphasis on the geriatric population. The student will also be introduced to safe environment, emergency measures and basic nursing skills. Skills are performed in a supervised laboratory and in the clinical setting. This course is intended to prepare students for employment as Nursing Assistants. The Federal and State OBRA laws and Minnesota Department of Health requirements are met in this course.

Student Learning Outcomes:

- * The student will be able to summarize acceptable behavior which complies with the Resident Bill of Rights, Vulnerable Adult Act, ethics and etiquette.
- * The student will be able to demonstrate effective communication and observation skills through conversation, active listening and gathering of facts related to residents care.
- * The student will be able to recognize and demonstrate appropriate resident unit order to meet safety needs of the resident and staff.
- * The student will be able to examine the importance of adequate food and fluid balance with elimination.
- * The student will demonstrate safe care of the resident when meeting their basics needs during activities of daily living (ADLs) which will include special populations.

Prerequisite(s): READ0900 or Appropriate Placement Score.
(3 C: 1 lect/pres, 2 lab, 0 other)

HLTH 1404 - Home Health Aide

This course is intended to prepare Nursing Assistants as Home Health Aides. The Federal and State OBRA Laws and MN Department of Health requirements are met in this course.

Student Learning Outcomes:

- * Focus on the Home Health Aide as an important team member providing a needed service for the community
- * Demonstrate accurate documentation of subjective and objective data obtained in the home setting
- * Relate how illness affects the family as a whole, I.E. children, hospice, and special populations
- * Examine cultural diversity of home care clients and its effect on health care provided

(1 C: 1 lect/pres, 0 lab, 0 other)

HLTH 1440 - Medical Terminology

This course presents a study of basic medical terminology. Prefixes, suffixes, word roots, combining forms, special endings, plural forms, symbols, and abbreviations will be covered. Emphasis is placed on spelling, definition, usage, and pronunciation. Students will learn the rules for separating medical terms into their word parts.

Student Learning Outcomes:

- * Define and pronounce medical terms
- * Identify medical prefixes/root words/suffixes
- * Identify specialty terms and health professionals
- * Identify medical, diagnostic and laboratory abbreviations
- * Recognize correct spelling and utilize medical dictionary

Prerequisite(s): READ0900 or Appropriate Placement Score.
(1 C: 1 lect/pres, 0 lab, 0 other)

HPER 1310 - Life Wellness

This course is designed to provide information and practical application of the seven domains of wellness. Each student will receive relevant information on how to live a happier, healthier life using the Seven Domains (Physical, Emotional, Intellectual, Interpersonal, Spiritual, Environmental, and Financial/Occupational). The interconnectedness of these domains will be discussed, with a special emphasis on how a deficiency in one domain can negatively influence the other domains. Finally, the course will provide information for students to design their own total wellness program.

Student Learning Outcomes:

- * Analyze wellness and fitness and describe parameters that comprise good physical health.
- * Explain why cardiovascular (CV) endurance is the most important component of fitness and how the main energy systems contribute to various forms of physical exertion.

- * Design a diet that conforms to healthy lifestyle principles.
- * Discuss major lifestyle behaviors that are associated with heart disease and how to reduce personal risk.
- * Identify the risk factors and warning signs for various forms of cancer, diabetes, and osteoporosis.
- * Discover how the body responds to stress, identify potential stressors and establish strategies to reduce stress.
- * Design and apply a personal program for developing and maintaining a healthy lifestyle.
- * Examine the meaning and interconnectedness of the seven domains of wellness.
(2 C: 2 lect/pres, 0 lab, 0 other)

HPER 1315 - Sports Related First Aid and CPR/AED

This course is designed to provide participants with the knowledge of what they are to do in an athletic related emergency before medical help arrives. Participants will be instructed to recognize and respond to athletic emergencies. This course will focus on cardiopulmonary resuscitation (CPR), automated external defibrillator (AED) use, how to respond in a choking situation, and basic first aid related to athletic competition.

Student Learning Outcomes:

- * Identify ways to prevent injury and/or illness in an athletic setting.
- * Accurately assess sports related emergencies and respond appropriately.
- * Effectively administer CPR and choking intervention.
- * Provide basic care for an athletic injury or sudden illness.
- * Communicate effectively in an emergency situation.
- * Demonstrate the correct use of AEDs.
- * Earn certification for American Heart Association-First Aid.
- * Earn certification for the American Heart Association CPR and AED.
(2 C: 2 lect/pres, 0 lab, 0 other)

HPER 1320 - Prevention and Care of Athletic Injuries

This course will provide introductory skills needed by coaches expected to provide initial care of injured athletes. Areas covered by this course will include Anatomy and Kinesiology. Participants will gain knowledge of injury prevention and care and rehabilitation. Practical skills in taping, splinting, wrapping and spine stabilization will be demonstrated.

Student Learning Outcome:

- * Demonstrate knowledge of care and prevention for athletic injuries.
- * Apply proper taping, bandaging, wrapping, and bracing techniques for athletic injuries.
- * Analyze legal issues in caring for athletic injuries.
- * Examine specific injuries to the human anatomy.
- * Assess and manage the healing process of athletic injuries.
- * Recognize emergency and environmental conditions.
(2 C: 2 lect/pres, 0 lab, 0 other)

HPER 1325 - Psychology of Sports and Coaching

The course will provide an overview of the growing field of Sports Psychology, which involves applying psychological science to sports. Students will be able to define sports psychology, describe characteristics of an individual, and identify and apply sports psychological theories. The course will illustrate goal setting, explain imagery and hypnosis in sport, and define the psychology behind exercise. Students will analyze the importance of attention and concentration in sports and be able to discuss the importance of youth sports.

Student Learning Outcomes:

- * Define sports psychology
- * Describe characteristics of an individual
- * Interpret and apply a multitude of sports psychological theories
- * Illustrate goal setting
- * Explain imagery and hypnosis in sport
- * Define the psychology behind exercise
- * Analyze the importance of attention and concentration in sports
- * Discuss the importance of youth sports
(3 C: 3 lect/pres, 0 lab, 0 other)

HPER 1330 - Coaching Methods

This course will cover coaching philosophies, behavior management in sports, teaching progression, game and practice management, psychology of coaching

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and fundamentals of physical training.

Student Learning Outcomes:

- * Develop a coaching philosophy
 - * Acquire knowledge of various coaching styles
 - * Analyze motivational techniques
 - * Apply techniques to appropriately manage athletes behavior
 - * Model communication skills with athletes, officials, fans, parents and facility management
 - * Develop out of season practice and training programs
 - * Illustrate knowledge of physiological principles
 - * Identify organizations and resources that will provide reliable information to the coaching field
- (3 C: 3 lect/pres, 0 lab, 0 other)

HPER 1335 - Football Coaching Theory and Skills Improvement

This course is designed to introduce the basic fundamentals of football. Students will be taught the rules, strategies and teaching points for proper football techniques.

Student Learning Outcomes:

- * Identification and application of basic football fundamentals
 - * Demonstrate basic skills and strategies of the game
 - * Distinguish between contrasting styles of play
 - * Construct a specific training schedule related to football
 - * Develop and illustrate offensive and defensive strategic diagrams
 - * Communicate and describe specific football techniques
- (2 C: 2 lect/pres, 0 lab, 0 other)

HPER 1340 - Volleyball Coaching Theory and Skills

This course is designed to introduce the basic fundamentals of volleyball. Student will learn the rules, strategies and proper etiquette as well as an appreciation for a lifetime activity.

Student Learning Outcomes:

- * Apply basic volleyball fundamentals
 - * Demonstrate basic skills of the game
 - * Illustrate basic offensive and defensive strategies
 - * Apply knowledge of scoring and officiating
 - * Construct and conduct a practice plan that demonstrates volleyball knowledge and skills
- (2 C: 2 lect/pres, 0 lab, 0 other)

HPER 1345 - Basketball Coaching Theory and Skills Improvement

This course is designed to introduce the basic fundamentals of basketball. Students will be taught the rules, strategies and teaching points for proper basketball techniques, as well as an appreciation for a lifetime activity.

Student Learning Outcomes:

- * Identification and application of basic basketball fundamentals
 - * Demonstrate basic skills and strategies of the game
 - * Distinguish between contrasting styles of play
 - * Construct a specific training schedule related to basketball
 - * Develop and illustrate offensive and defensive strategic diagrams
 - * Describe and explain specific basketball techniques
- (2 C: 2 lect/pres, 0 lab, 0 other)

HPER 1350 - Self Defense I

Participants will learn theories and techniques of self-defense. Content focuses on methods of recognizing and avoiding dangers, as well as, the acquisition of skills and strategies of an effective physical self-defense.

Student Learning Outcomes:

- * Identify risk reduction opportunities and comprehend surrounding awareness skills to avoid having to use physical self defense
- * Demonstrate proper physical defense techniques and know when to use them
- * Applies safety awareness in home and auto security
- * Differentiates sexual assault offenses, date rape and other offenses and knows community resources designed to assist and/or counsel victims
- * Distinguishes the difference between domestic violence and healthy relationships
- * Relates and analyzes awareness within current events and the latest in methods and techniques

(1 C: 0 lect/pres, 1 lab, 0 other)

HPER 1355 - Baseball Coaching Theory and Skills Improvement

This course is designed to give students the skills to be a successful baseball coach. Students will learn all aspects of the game of baseball, specifically pertaining to the organization and management of a baseball program at any level. Topics will include fundamentals of all aspects of the game, game and practice management, and strength training and conditioning specific to baseball.

Student Learning Outcomes:

- * Describe proper fundamentals of each aspect of the game of baseball.
 - * Describe the importance and mechanics of baseball specific strength training and conditioning.
 - * Identify proper fundamentals of each aspect of the game of baseball.
 - * Analyze and breakdown both offensive and defensive principles.
 - * Prepare and apply practice plans.
 - * Prepare and apply game day duties.
 - * Collect information about new trends in baseball.
 - * Creation of students own playbook.
- (2 C: 2 lect/pres, 0 lab, 0 other)

HPER 1360 - Weight Training and Conditioning

This physical education course is an activity class, which emphasizes strength training development and also includes cardiovascular development through continuous aerobic activity for overall fitness.

Student Learning Outcomes:

- * Explain the concepts of weight training
 - * Demonstrate the ability to take resting heart rate, determine work out intensity and body composition
 - * Improve body composition
 - * Improve muscular development and cardiovascular fitness through the manipulation of volume and intensity
 - * Demonstrate an understanding of the need for physical fitness throughout life
- (1 C: 1 lect/pres, 0 lab, 0 other)

HPER 1365 - Softball Coaching Theory and Skills Improvement

This course will focus on the theory and improvement of skill development, playing strategy, scoring and rules related to softball. Participants will become proficient in the basic fundamentals of softball.

Student Learning Outcomes:

- * Interpret rules applicable to participation in softball.
 - * Demonstrate the proper technique of throwing, catching, and batting a softball.
 - * Explain strategies and terminology associated with softball.
 - * Create values of teamwork and communication skills related to softball.
 - * Develop skills to participate in softball as a life- long activity.
- (2 C: 2 lect/pres, 0 lab, 0 other)

HPWT 2502 - Reverse Osmosis Chemistry

Reverse Osmosis (OR) Chemistry applies chemical concepts to water and membrane technologies. It relates atomic theory to water contaminants so as to develop a thorough understanding as to why particular contaminants behave the way they do. It includes the means by which those contaminants are measured or characterized. It then applies these principles to reverse osmosis membrane technology in order to recognize how the water characteristics affect the performance of the membrane.

Student Learning Outcomes:

- * Realize the origins of water contaminants
 - * Understand the relationship between the atomic structure of a water contaminant and its behavior
 - * Apply common methods of measurement for characterizing a water source
 - * Use the Periodic Table to predict contaminant behavior
 - * Understand the unique characteristics of water as they relate to contaminant behavior
 - * Correctly use and convert concentrations commonly used in water treatment
 - * Recognize how pH and alkalinity affect the characteristics of a water source
 - * Understand how chemical oxidation and reduction apply to water treatment
 - * Identify operational variables that affect reverse osmosis (RO) membrane performance
 - * Recognize the relative advantages of the common RO membrane types
- (2 C: 2 lect/pres, 0 lab, 0 other)

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HPWT 2504 - Reverse Osmosis Principles

Reverse Osmosis (RO) principles develops an understanding of the components and issues involved in an operational RO system. It covers the issues involved in the mechanical configuration of an RO membrane system. It applies design variables, discusses monitoring variables, and demonstrates how to adjust variables in a working RO system. It also illustrates some of the important RO maintenance functions, as well as some critical RO performance concerns.

Student Learning Outcomes:

- * Give the advantages of different reverse osmosis (RO) membrane configurations relative to their potential applications
- * Understand the role played by the different components in an RO system
- * Recognize how staging affects RO permeate recovery
- * Trace the RO flow streams and the relative ion concentrations within the system
- * Name the common RO maintenance concerns and how they can be prevented
- * Recognize the effect of throttle valves on RO flow and performance characteristics
- * Realize the differences in configuration between two-pass and single-pass RO systems
- * Understand the principles of how pumps convert electrical energy into pressure
- * Identify the operating variables for an RO system
- * Relate the 3 RO design variables to the potential for fouling or scale formation
- * Explain how fouling or scale formation occurs and how it affects system performance
- * List the common causes of membrane deterioration and how they can be prevented

(2 C: 2 lect/pres, 0 lab, 0 other)

HPWT 2506 - Reverse Osmosis (RO) Monitoring

Reverse Osmosis (RO) Monitoring provides the tools necessary for the detailed tracking of the performance of a reverse osmosis (RO) system. It includes common methods of analysis for key water contaminants. It develops an understanding of the RO operating and performance variables, including how they are calculated and applied. It completes with methods that can be used to break down and characterize RO system performance as a means of monitoring or of analyzing system problems.

Student Learning Outcomes:

- * Use methods common for predicting reverse osmosis (RO) membrane fouling potential
- * Determine a contaminant concentration using titration and colorimetric methods
- * Recognize the importance of specific contaminants with respect to concerns of fouling or scale formation
- * Employ methods for verifying scale inhibitor injection concentrations
- * Explain pressure from a molecular perspective and describe how it is measured
- * Record the key RO operating variables with accuracy and precision
- * Calculate the normalized RO system performance variables
- * Verify instrument values and calibrations
- * Employ methods for breaking down and characterizing RO system performance
- * Apply methods for analyzing RO system problems

(2 C: 2 lect/pres, 0 lab, 0 other)

HPWT 2508 - Reverse Osmosis (RO) Cleaning

Reverse Osmosis (RO) Cleaning develops an understanding of the chemical nature of cleaning solutions so as to correctly apply them in maximizing RO membrane cleaning effectiveness. It explains how the different cleaning agents work in the removal of common membrane foulants and scale. It then offers methods for correctly cleaning an RO membrane system and evaluating the effectiveness of a cleaning.

Student Learning Outcomes:

- * Understand the role played by surfactants, chelating agents, and pH in cleaning particular foulants and scale
- * Learn methods for the removal of iron, manganese, biofilm, oil, grease, and carbonate, sulfate, and silica scale
- * Predict the optimum time to clean a reverse osmosis (RO) membrane system
- * Recognize the importance of cleaning solution volume and how to determine it
- * Correctly perform an RO cleaning using optimum pressures, flow rates and temperature
- * Record the cleaning data necessary to evaluate cleaning procedures
- * Apply procedures for safely returning an RO system to service after a cleaning
- * Understand the issues involved in designing an RO cleaning system

* Recognize the importance of mixing, temperature control, and filtration in RO cleaning

* Determine in advance the optimum cleaning solution for a fouled/scaled RO system

(2 C: 2 lect/pres, 0 lab, 0 other)

HPWT 2510 - Reverse Osmosis (RO) Pretreatment

Reverse Osmosis (RO) Pretreatment details the equipment requirements upstream of a reverse osmosis (RO) system so as to minimize the RO maintenance requirements and increase the longevity of the membrane elements. It begins with the treatment provided by many municipal water treatment facilities and expands this into the requirements more specific for RO systems. This covers media filtration for removal of suspended solids, acid and scale inhibitor injection, or softening, for control of scale formation, and the removal of biocides that might be incompatible with the RO membrane.

Student Learning Outcomes:

- * Understand the effect of the particular municipal water treatment on the needs of the industrial reverse osmosis (RO) pretreatment system
- * List the reasons for RO pretreatment and the consequences for its inadequacies
- * Recognize critical design features required in RO pretreatment heat exchangers
- * Provide ways for reducing the potential for RO fouling due to suspended solids
- * Calculate the potential for scale formation in an RO system with/without control methods
- * Give the advantages and disadvantages of acid injection, scale inhibitor injection, and softening when used to prevent scale formation in an RO system
- * Correctly set up an injection system for a given dosage
- * Give the advantages and disadvantages of activated carbon filtration
- * Describe how to economically use cartridge filters in an RO pretreatment system

(2 C: 2 lect/pres, 0 lab, 0 other)

HPWT 2512 - Reverse Osmosis (RO) Biological Control

Reverse Osmosis (RO) Biological Control investigates the nature of biological activity so as to better understand how it can be effectively controlled in a reverse osmosis (RO) system. It discusses the needs that bacteria have for their survival and how their reproduction can foul an RO system. It covers the different methods available for killing and controlling bacteria and how these methods can be applied to an RO system.

Student Learning Outcomes:

- * Understand how bacteria are able to survive and propagate in different environments
- * Recognize the importance in preventing the formation of mature biofilm either upstream or within an RO system
- * Realize how different biocides affect the needs of bacteria in their method of controlling or killing them
- * Give the advantages and disadvantages of using the different particular biocides
- * Understand how certain wavelengths of ultraviolet light can affect bacteria
- * Correctly apply UV light systems for biological control
- * Give methods for dealing with the remnants of mature upstream biofilm
- * Apply different methods for biological control of an RO system
- * Set up an RO system for an extended shutdown

(2 C: 2 lect/pres, 0 lab, 0 other)

HPWT 2514 - Reverse Osmosis (RO) System Design

Reverse Osmosis (RO) System Design applies water quality information to the design of a reverse osmosis (RO) system that is based on meeting the requirements of the membrane element manufacturers. It covers the options available when designing a new system, including design methods for reducing the fouling or scale formation potential of the system. It also includes methods for designing a two-pass RO system, for projecting RO permeate quality, and for estimating the RO system operating and capital equipment costs.

Student Learning Outcomes:

- * List the qualities of a water source that will affect a reverse osmosis (RO) design
- * Recognize the importance of expected permeate quality in the design of an RO
- * Calculate scale formation potential for the concentrate stream of an RO system
- * Select an optimum RO permeate recovery based on desired permeate quality and the potential for scale formation
- * Choose the best membrane, element and housing size for an application

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

- * Correctly stage and optimize spiral-wound membrane elements for an application
- * Size a high pressure pump based calculated pressure requirements for an RO design
- * Understand the issues related to the RO frame and pipe manifolding characteristics
- * Size a workable throttle valve for the feed pressure, concentrate, or recycle streams
- * Choose the necessary instrumentation for an RO system
- * Design a two-pass RO system
- * Project permeate quality for an RO system when given a feed water analysis
- * Estimate equipment and operating costs for a new RO system
(2 C: 2 lect/pres, 0 lab, 0 other)

HPWT 2516 - Reverse Osmosis (RO) System Analysis

Reverse Osmosis (RO) System Analysis provides methods for logically determining the likely cause of a problem in reverse osmosis (RO) performance. It includes methods for isolating the location of the problem within the RO system as a means of gaining insight into the problem. It includes common system performance problems as they relate to the location of the problem. It also covers methods for verifying the suspected problem.

Student Learning Outcomes:

- * Recognize the importance of verifying instrument readings when a reverse osmosis (RO) problem is first suspected
- * Outline a method for investigating the cause of a reverse osmosis (RO) problem
- * List common problems as they specifically relate to lead-end, tail-end, isolated, or uniform RO membrane deterioration, or to the same isolated feed-to-concentrate pressure drop
- * Give common reasons for failure to restore permeate flow rate after cleaning
- * Provide method for analyzing membrane foulants
(2 C: 2 lect/pres, 0 lab, 0 other)

HPWT 2518 - Ion Exchange (IX) Principles

Ion Exchange (IX) Principles applies concepts of water chemistry and chemical equilibrium to the development of a detailed understanding of the ion exchange process. It covers the nature of ion exchange resins, and how they are used in single-bed, two-bed, and mixed-bed systems in the creation of high purity water. It includes information on how to monitor and optimize the performance of ion exchange systems.

Student Learning Outcomes:

- * Relate the chemical nature of dissolved salts to their behavior as ions present in water
- * Work with ionic concentrations that are useful in calculating ion exchange capacities
- * Recognize the importance of water pH as it impacts ion exchange bed performance
- * Identify the chemical functional groups responsible for the characteristics of different ion exchange resins
- * Understand the importance of ion exchange resin bead mechanical characteristics as they impact resin bed performance
- * Give the relative advantages of different methods used to regenerate resin beds
- * Determine the best type of ion exchange system for an application
- * List the steps used to regenerate an ion exchange bed and the purpose served by each
- * Provide methods for manipulating resin equilibriums as a means of obtaining better effluent quality
- * Understand the options available for dealing with organic and inorganic resin fouling
(2 C: 2 lect/pres, 0 lab, 0 other)

HPWT 2520 - Electrodialysis Reversal (EDR) and Electrodeionization (EDI)

Electrodialysis Reversal (EDR) and Electrodeionization (EDI) Principles relates concepts of ionic conductivity and electricity to electrochemistry, as it applies to electrodialysis reversal (EDR), and then builds on this knowledge to explain electrodeionization (EDI). It discusses how ion exchange membrane sheets and electricity can be used to move ions out of a feed water stream into a concentrate stream in the EDR process. Scale control is performed by switching electrode polarity and reversing the movement of ions. Ion exchange resin beads can be added within certain chambers of the device as a means of continuously achiev-

ing even higher purity effluent water in the EDI process.

Student Learning Outcomes:

- * Understand the relationship between ionic concentrations, total dissolved solids (TDS), water conductivity and resistivity
- * Explain how charge can be transferred through water using concepts of electric potential/voltage, water electrolysis, and ionic conductivity
- * Quantify the ionic movement processes using Faraday's Law when given a quantity of cells/cell parts in an electrodialysis reversal (EDR) stack
- * Identify the streams within an EDR or electrodeionization (EDI) system
- * Quantify the effect of concentrate concentration of EDR and EDI system efficiencies
- * Explain the effect of reversing electrode polarity on organic/inorganic fouling
- * Understand how water splitting can be a disadvantage in EDR systems and an advantage in EDI systems
- * Relate water splitting to pH polarization and the ability to achieve maximum effluent EDI quality
- * Calculate resistance, voltage, and efficiency for a given EDR/EDI system
- * Correctly start up and adjust flow rates and voltage/current for an EDR/EDI system
- * Monitor EDR/EDI systems so as to know when maintenance is required
- * Clean and sanitize an EDI system
(2 C: 2 lect/pres, 0 lab, 0 other)

HPWT 2522 - Ion Exchange (IX) System Design

Ion Exchange (IX) System Design provides methods for designing ion exchange systems and predicting their performance. It covers how to relate incoming water quality to design variables, how to choose resin types, and size tanks. It also covers regeneration system design and flow rate calculations. It finishes with topics related to the application of ion exchange units to high purity water systems.

Student Learning Outcomes:

- * Use a water analysis in designing an ion exchange system and predicting its performance
- * Understand the differences and advantages offered by varying resin types
- * Apply bed performance issues in sizing an ion exchange tank
- * Understand the issues involved in designing tank laterals and their importance
- * Set up the flow rates and times required for regeneration an ion exchange system
- * Recognize the issues involved in designing a regeneration system
- * Choose and locate the instruments correctly for monitoring system performance
- * Design a high purity water system using ion exchange components
- * Recognize which regenerant water streams can be recycled and to where
(2 C: 2 lect/pres, 0 lab, 0 other)

HPWT 2524 - Ion Exchange (IX) System Analysis

Ion Exchange (IX) System Analysis provides methods for determining if there is a problem with the performance of an ion exchange bed and for finding out what the problem is. It discusses the symptoms of common ion exchange problems. It details how water and resin analyses can be used to monitor and identify problems. Finally, it discusses how to fix common problems and avoid their occurrence.

Student Learning Outcomes:

- * List the common reasons for ion exchange performance problems as they relate to their particular symptoms
- * Sample high purity water with minimal contaminant introduction
- * Understand how to apply and interpret high purity water analyses
- * Pull resin samples that truly represent the bed constituents
- * Correctly interpret resin analyses
- * Replace a resin bed and be able to deal with problems that are common with new resins
- * Brine an organically fouled resin bed
- * Deal with fouling of resins by iron or scale
- * Investigate IX problems with distribution/laterals
- * Maximize removal of trace contaminants that are poorly ionized
(2 C: 2 lect/pres, 0 lab, 0 other)

HPWT 2526 - Deionized (DI) Water Principles

Deionized (DI) Water Principles develops an understanding of the nature of deionized (DI) water as a process chemical, how it is created, and how it is used. It includes a discussion of the various DI water requirements from different indus-

tries, and the methods used to achieve those qualities. It covers many of the challenges of DI water systems and the methods used to deal with those challenges.

Student Learning Outcomes:

- * Understand why deionized (DI) water is useful in different applications
- * Recognize the difficulty in creating and maintaining DI water
- * Realize the differences in DI water priorities for the different industries
- * List the functions served by each of the DI water system subsystems
- * Understand the challenges in the membrane filtration of DI water
- * Give materials of system construction that would be appropriate for an application
- * Explain the concerns about using storage tanks in DI water systems
- * Describe the methods available for biological control in DI water systems
(2 C: 2 lect/pres, 0 lab, 0 other)

HPWT 2528 - Deionized (DI) Water System Design

Deionized (DI) Water System Design explains the options available when designing a water treatment system as they are affected by the feed water quality and the desired deionized (DI) water quality. It details with the roles played by different types of water treatment equipment in their contribution to the production of a high purity water. It covers the sizing of flow rates and equipment. It also discusses the design of reclaim DI water systems and distribution piping systems.

Student Learning Outcomes:

- * Recognize the effect of feed water quality in deionized (DI) water system design
- * Relate desired final water quality to the DI system design
- * Size flow rates and storage tanks used in DI subsystems
- * Understand the relative advantages of the different types of equipment that could be used in each module of the DI system
- * Design a reclaim system that minimizes the possibility of system upsets
- * Choose when a serpentine or a ladder distribution piping system is most appropriate
- * Size the piping to be used in a distribution system
- * Understand the importance of instrumentation in a DI system
(2 C: 2 lect/pres, 0 lab, 0 other)

HPWT 2530 - Deionized (DI) Water System Analysis

Deionized (DI) Water System Analysis stresses the use of scheduled and documented instrument calibration in combination with the establishment of a contaminant history throughout a deionized (DI) water system, which can later be used to isolate DI water-related problems. It relates analytical techniques to common DI water equipment problems, and explains how specialized techniques can be used to identify a contaminant. It includes a method of correlating water quality trends with other process changes and isolating the problem with its DI system origination.

Student Learning Outcomes:

- * Recognize the importance of scheduled instrument calibrations
- * Apply particular measurements to the identification of DI equipment concerns and to the regular monitoring of equipment performance
- * Recognize the importance of establishing a measurement history for a DI water system
- * List the common reasons for declining DI water quality
- * Correlate DI water quality trends with other process variables
- * Apply specialized instrumentation for the identification of contaminants
- * Correctly install/remove an SEM filter
- * Understand the statistical significance of analytical measurements
- * Isolate a contaminant source to a DI system component
(2 C: 2 lect/pres, 0 lab, 0 other)

HPWT 2532 - Deionized (DI) Water Maintenance

Deionized (DI) Water Maintenance describes how the various on-line, on-site and off-site analysis can be used to monitor the performance of a DI water system as a basis for determining its maintenance requirements. It explains the purpose and limitations of some common analytical techniques, and special concerns related to analyzing DI water. It covers the proper methods for changing our cartridge filters and verifying their integrity. It also covers methods for sanitizing piping systems.

Student Learning Outcomes:

- * Give the purpose and limitations of the analytical methods available for deionized water

- * Accurately perform a bacteria culture using the membrane filtration method
- * Understand the functioning and value of the various methods of on-line measurement
- * Properly pull a water sample for off-site analysis
- * Determine which common analytical technique would be appropriate for a particular type of contaminant
- * Change out a cartridge filter housing with minimal contamination
- * Apply three of the methods available for testing the integrity of cartridge filters
- * Give the advantages and disadvantages of commonly used piping sanitization chemicals
- * Properly prepare for and perform a thorough distribution system sanitization
(2 C: 2 lect/pres, 0 lab, 0 other)

HUMN 1320 - Holocaust and Genocide Studies

Meets MN Transfer Goals 6 and 9 - Humanities and Ethical and Civic Responsibility. This course provides a broad introduction to Holocaust and contemporary genocide studies. Students will read, discuss, and analyze various types of Holocaust and other contemporary genocide literature, as well as, the relevant historical events and perspectives, which surround the Holocaust and other contemporary genocides. The contemporary genocides studied will vary.

Student Learning Outcomes:

- * Define Holocaust and Genocide
- * Identify historical events and people surrounding the Holocaust and other contemporary genocides
- * Compare and contrast the Holocaust and other genocides studied
- * Explore Holocaust and genocide literature
- * Identify themes in Holocaust and genocide literature
- * Examine themes in specific literary pieces of Holocaust and genocide literature
- * Relate themes to mind-set of hate
- * Apply critical thinking skills to achieve clarity, accuracy, precision, depth, and fair-mindedness in reading, speaking, writing, and listening
Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

HUMN 1340 - Middle Eastern Cultures

Meets MN Transfer Curriculum Goal Areas 6 and 8 - Humanities and Global Perspectives. This course aims to expand students' knowledge of the various cultures within the Middle East. It examines how the region's cultural values have been influenced by their shared history since the 19th century, as well as by their major religion of Islam. Students thus achieve a thorough understanding of the various cultures within the region by examining the customs and rituals, critiquing culturally influenced political systems, and gaining insight from speakers and field trips.

Student Learning Outcomes:

- * Analyze the factors that led to the creation of the current borders within the Middle Eastern countries.
- * Analyze, synthesize, and critically examine cultural roots and literacy.
- * Research the role of Islam and colonialism in shaping the Middle East region
- * Differentiate between primary and secondary identities to understand the dynamics of national unity.
- * Evaluate colonial attitudes and their impact on today's stereotypes about the Middle East.
- * Critically evaluate how culture and language shape our thoughts, behaviors, and attitudes
- * Identify the geographical distribution of ethnic groups by colonialist powers
- * Evaluate a current conflict in the Middle East using a historical and social perspective to gain deeper understanding.
Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

HUMN 2350 - Film and American Culture

Meets MN Transfer Curriculum Goal Area 6 - Humanities. This course examines how the Hollywood film industry has affected American culture, and continues to influence our society. By watching, discussing, and writing about films you will investigate the culture in which we live and the movies our culture produces. The history of the movie industry is an intriguing subject that reveals the evolving interaction of society and the film industry. Topics such as the early star and studio system, the Hollywood style, and narrative offer a base to explore various film genres and explain how movies both influence and exhibit American culture.

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

Student Learning Outcomes:

- * Demonstrate a working knowledge of American film history within an historical and social context.
 - * Develop cinematic literacy via film critiques, analyses and discussions.
 - * Describe how the technology of movies has influenced the American film industry.
 - * Explain Hollywood film industry's place in American popular culture.
 - * Analyze the role of genre in American film history, and the relationship between genre and American social history.
 - * Illustrate "realism" and how it relates to motion pictures
 - * Evaluate our roles as passive spectators of the medium.
 - * Critically analyze films to appreciate the medium as art and an industry.
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

HUMN 2352 - Holocaust Field Studies

Meets MN Transfer Goal Area 6 - Humanities. This course will introduce students to the United States Holocaust Memorial Museum and give them an opportunity to tour the museum. The tour will give the students a chance to view primary documentation and actual Holocaust artifacts. Students will also have the privilege to meet and interact with a Holocaust survivor and hear his/her experience firsthand.

Student Learning Outcomes:

- * Acquire information on Judaism by visiting a Synagogue and speaking with a Rabbi
 - * Attend and tour a traveling Holocaust exhibit in the Twin Cities
 - * Read a Holocaust survivor's memoir and then discuss with the survivor his/her experience
 - * Discover the mindset and main events surrounding and including the Holocaust and its aftermath by touring the National Holocaust Memorial Museum in Washington DC
 - * Discuss the permanent exhibit in the National Holocaust Memorial Museum
 - * Research and then prepare a formal presentation of the information learned from the permanent exhibit tour. The presentation will be given to members of the college community
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(1 C: 1 lect/pres, 0 lab, 0 other)

ICVT 1422 - Cardiovascular Instrumentation

This course is intended to fulfill course requirements for the Cardiovascular Technology program. Cardiovascular Instrumentation is a study of concepts that serve as the foundation for the cardiovascular technology field. This course covers in detail biological effects of radiation, radiation safety, x-ray tubes and image intensifiers. Students explore benefits, risks, and indications of physiologic monitoring. Learners will be able to identify parts and address the function of the physiologic monitoring transducer.

Student Learning Outcomes:

- * Define selected terms related to the cardiac field.
 - * Demonstrate an understanding of basic electricity and electrical safety.
 - * Describe the function and parts of the fluid filled physiologic monitoring transducer system.
 - * Identify the parts and function of the Wheatstone bridge, from the diagram given.
 - * Differentiate between physics principles of positive/negative hydrostatic pressure head.
 - * Identify the various parts of a cathode ray tube from the diagram given.
 - * Describe the function and identify the various parts of the x-ray tube.
 - * Describe the function and identify the various parts of the image intensifier.
 - * Describe the origin of scatter radiation and methods used to control scatter radiation.
 - * List the biological effects of radiation exposure and techniques for reducing radiation exposure.
 - * Comprehend benefits monitoring arterial pressure, central venous pressure (CVP), and pulmonary artery pressure are beneficial.
- Prerequisite(s): ICVT1445.
(3 C: 3 lect/pres, 0 lab, 0 other)

ICVT 1424 - Catheterization Lab Fundamentals I

This course is intended to fulfill course requirements for the Cardiovascular

Technology program. Catheterization Lab Fundamentals I focuses on diagnostic procedures that are performed in the cardiac catheterization lab. Students will learn the history of coronary angiograms, myocardial circulation, catheter recognition as well as basic catheterization techniques for a right and left heart catheterization. Students will have the opportunity to calculate Fick cardiac output measurements for evaluation.

Student Learning Outcomes:

- * Define selected terms related to cath lab procedures, hemodynamic monitoring, and coronary angiography.
- * Analyze hemodynamic data and calculate Fick Cardiac Outputs and associated parameters.
- * Compare and select appropriate catheter for stated procedure.
- * Describe the techniques used in completing a routine right heart cath on the normal adult patient.
- * Describe the techniques used in completing a routine left heart cath with coronaries on the normal adult patient.
- * Summarize history of cardiac catheterization and the progression of the procedure over time.

Prerequisite(s): ICVT1402, ICVT1445.

(3 C: 3 lect/pres, 0 lab, 0 other)

ICVT 1430 - EKG Interpretation

This course is intended to fulfill course requirements for the Cardiovascular Technology program. Students will find this course useful as it provides a detailed understanding of the components and make-up of the cardiac conduction system. This course covers in detail the physiologic components of an EKG from basic to advanced concepts. Students will have the opportunity to perform, analyze and interpret 12-lead EKG's performed on fellow classmates or other living patients. Additional focus will include normal rhythms, atrial rhythms, ventricular rhythms, heart blocks and acute myocardial infarction recognition and location.

Student Learning Outcomes:

- * Describe phases in the action potential of the cardiac cell.
- * Label Einthoven's triangle as it pertains to limb leads and augmented leads.
- * Identify P wave, QRS complex, T wave, ST segment, PR interval and PR segment on a normal EKG.
- * Demonstrate proper 12-lead EKG patch placement on a living patient (classmate, family member, etc.).
- * Analyze and interpret EKG rhythm strips containing normal sinus rhythms, atrial rhythms, ventricular rhythms, and AV (atrioventricular) blocks.
- * Identify temporary and permanent pacemaker indications.
- * Recognize location of myocardial infarction based on EKG interpretation.

Prerequisite(s): ICVT1402, ICVT1445.

(1 C: 0 lect/pres, 1 lab, 0 other)

ICVT 1441 - Introduction to Clinics

This course is intended to fulfill course requirements for the Cardiovascular Technology program. Students will find this course useful as it explores main ideas and basic concepts of an entry level CVT (Cardiovascular Tech). Learners will perform tasks related to vital signs, sterile technique and patient transfers. Additional topics addressed will include death and dying, universal precautions, and ethical theory and concepts. Lecture and simulated laboratory experience prepares the student to perform patient care utilizing critical thinking and clinical skills.

Student Learning Outcomes:

- * Identify current standards for safety and infection control as established by OSHA, CDC, and other agencies.
- * Compare and contrast the links of the chain of infection and their role in disease process.
- * Describe the correct patient-transfer methods utilizing proper body mechanics.
- * Understand and demonstrate how to measure vital signs.
- * Demonstrate an understanding of universal precautions.
- * Identify responsibilities in various medical situations, i.e. emergencies, dressings and drains, latex allergies.
- * Demonstrate basic sterile technique by performing open gloving technique, establishing and maintaining a sterile field as well as introducing items on the sterile field.
- * Differentiate between "confidential information" and "confidentiality".
- * Distinguish between ethical situations and ethical problems.
- * Define and implement patient confidentiality.

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- * Explain main ideas of the basic concepts an entry level CVT will acquire, i.e. basic knowledge of EKG, basic knowledge of radiation, catheterization lab etiquette, CVT job roles, sheath insertion.
- * Review Cardiovascular Credentialing International (CCI) Code of Ethics. (3 C: 3 lect/pres, 0 lab, 0 other)

ICVT 1443 - Cardiovascular Clinical I

This course is intended to fulfill course requirements for the Cardiovascular Technology program. Cardiovascular Clinical I provides an introduction to the aspects of cardiac catheterization lab in a hospital or simulated clinical laboratory setting. Using hands-on tools, learners perform sterile technique, hand washing, entry-level scrubbing, circulating, monitoring and lab set-up.

Student Learning Outcomes:

- * Prepare the physiologic monitor for use and troubleshoot common machine errors.
- * Record, analyze, and process hemodynamic data for interpretation in the simulated cath lab setting.
- * Demonstrate appropriate surgical scrub and hand washing technique.
- * Demonstrate proper gowning and gloving technique.
- * Prepare sterile table for routine cardiac cath procedure.
- * Assist in performing right heart cardiac cath procedures in the simulated cath lab setting.
- * Assist in performing left heart cardiac cath procedures, including coronaries, in a simulated cath lab setting.
- * Demonstrate set-up and operation of basic contrast injector systems. (5 C: 0 lect/pres, 5 lab, 0 other)

ICVT 1445 - Cardiovascular Anatomy and Physiology

This course is intended to fulfill course requirements for the Cardiovascular Technology program. Cardiovascular Anatomy and Physiology studies the anatomy, physiology, and structural relationships of the human heart and vascular system. Students learn cardiac terminology that serves as a foundation for all CVT courses. The lab component focuses on heart and torso models, angiographic views, Wiggers diagram and dissection of a pig heart.

Student Learning Outcomes:

- * Define selected terms related to the cardiovascular system.
- * List the components and function of the blood.
- * Describe the structures and function of the cardiovascular system including the heart, major vessels, and coronary vasculature.
- * Identify the hemodynamic waveforms and pressure values of each of the cardiac chambers and major vessels.
- * Describe the structure and function of the conduction system.
- * Distinguish angiographic views and coronary anatomy within those views.
- * Summarize the cardiac physiology of one cardiac cycle using the Wiggers diagram.

Prerequisite(s): BLGY2310.

(3 C: 2 lect/pres, 1 lab, 0 other)

ICVT 2405 - Cardiovascular Pathology

This course is intended to fulfill course requirements for the Cardiovascular Technology program. Cardiovascular Pathology is an in-depth study of the pathologies of the cardiac and vascular systems, their physiologic symptoms and outcomes. This course includes discussion of acquired diseases, embryological development of the heart, fetal circulation, and congenital heart defects. This course will cover in detail the atherosclerotic process of heart disease and how it relates to myocardial infarction. Additional focus will include heart failure and valve disease.

Student Learning Outcomes:

- * Define selected terms related to diseases and congenital anomalies of the cardiovascular system.
- * Identify cardiac valvular disease processes including their hemodynamic changes.
- * Identify the pathologic changes that occur in coronary artery disease and myocardial infarction; summarize treatment and intervention modalities.
- * Compare and contrast forward failure and backward failure.
- * Identify physiologic changes that occur in select acquired cardiac diseases.
- * Describe the embryologic development of the heart and great vessels.
- * Identify the blood flow pathway in fetal circulation.
- * Describe the congenital anomalies of the heart and great vessels identifying

shunt, prognosis and palliative and definitive surgical repairs.

- * Describe the clinical significance of both left-to-right and right-to-left shunts.
 - * Analyze hemodynamic data to calculate intracardiac shunt measurements.
- Prerequisite(s): ICVT1402, ICVT1445.
(3 C: 3 lect/pres, 0 lab, 0 other)

ICVT 2427 - Catheterization Lab Fundamentals II

This course is intended to fulfill course requirements for the Cardiovascular Technology program. Catheterization Lab Fundamentals II is a continuation of ICVT 1424 Catheterization Lab Fundamentals I. Learners will gain in-depth knowledge of cardiac medication and its use. This course has additional emphasis on heart failure, advanced cardiovascular diagnostic and therapeutic procedures, percutaneous coronary intervention procedures, cardiac surgical procedures, pacemakers and electrophysiology.

Student Learning Outcomes:

- * Define selected terms related to percutaneous coronary interventions, and cardiac surgical procedures.
 - * Compare and select appropriate interventional catheter for stated procedure.
 - * Describe the C/V Techs role in angioplasty/stent placement and other interventional procedures.
 - * Describe the proper use of cardiac medications during a cardiac cath procedure.
 - * Describe the C/V Techs role in a variety of electrophysiology studies, temporary and permanent pacemaker procedures.
 - * Discuss the use and function of an intra-aortic balloon pump.
 - * Analyze hemodynamic data and calculate valve areas.
 - * Identify surgical instruments used in permanent pacemaker implantation.
- Prerequisite(s): ICVT1423, ICVT1402, ICVT1445, ICVT1424.
(3 C: 3 lect/pres, 0 lab, 0 other)

ICVT 2446 - Cardiovascular Clinical II

Practical training with focus on completing and becoming proficient in all duties of the cardiovascular technologist in the cath lab, to include diagnostic and interventional procedures, in both scrub/circulate and hemodynamic monitoring capacities.

Student Learning Outcomes:

- * Record and process abnormal hemodynamic data for interpretation in the simulated or clinical cath lab setting
 - * Analyze and interpret advanced measurements and calculations derived from cardiac cath to quantify the severity of various cardiac pathologies
 - * Prepare catheters on a sterile field for interventional cardiac cath procedure
 - * Assist in performing balloon angioplasty/stent placement procedures in the simulated or clinical cath lab setting
 - * Demonstrate proper set-up of an intra-aortic balloon pump (IABP)
 - * Evaluate IABP settings for proper timing, inflation time and deflation time
- Prerequisite(s): ICVT1443, ICVT1402, ICVT1445.
(5 C: 0 lect/pres, 5 lab, 0 other)

ICVT 2450 - Applied Clinical Internship

This course is intended to fulfill course requirements for the Cardiovascular Technology program. Students will participate in an advanced and intense internship in a hospital or clinic setting. Specific detailed learning objectives are developed for each course by the college faculty. Students will broaden and perfect their skills through hands-on participation. Students will be able to carry out everyday duties of the technologist when their clinical experience is complete. Learners will complete case studies of pathologies they encounter during internship. Time is spent preparing for the national registry exam post graduation.

Student Learning Outcomes:

- * Define selected terms related to clinical cardiac physiology and pathophysiology.
 - * Perform day-to-day cardiac cath lab operations (patient/staff interaction, restocking, etc.).
 - * Identify cardiac pathology from cardiac cath lab findings.
 - * Perform advanced measurements and calculations to quantify severity of cardiac disease states.
 - * Work as a team member within the cardiac cath lab; displaying professionalism, courtesy to patients and clinical staff, and a willingness to learn.
- Prerequisite(s): ICVT2426, ICVT2446, ICVT2427.
(13 C: 0 lect/pres, 0 lab, 13 other)

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IHCP 2010 - Community Based Needs and Strategies for Care

Upon completion of this course the student learner will understand the role of the community paramedic and their part of the health care continuum. The student learner will be able to formulate and analyze community needs as it pertains to the overall health of their populace served. The student will be able to finalize this information into a workable plan using interdisciplinary collaboration to make a positive impact to their community's overall health.

Student Learning Outcomes:

- * Formulate a community health assessment as it applies to the population served.
- * Develop a network of resources for patients/clients served.
- * Execute a plan to coordinate care for the population served based on health needs assessment.
- * Design a plan of care to meet individual's needs in the following areas Type 2 Diabetes, Asthma, Heart Failure, Osteoarthritis, Obesity, Depression and Chronic Pain.
- * Evaluate health records of patients to assist in plan of care.
- * Document in health care record to ensure communication through the health-care continuum.

(3 C: 3 lect/pres, 0 lab, 0 other)

IHCP 2015 - The Role of the Community Paramedic in the Continuum of Care

Upon completion of this course the student learner will comprehend actions to promote health, injury prevention, and chronic disease management to the community. The student will incorporate cultural impacts on the health care system and how to address various cultural components into the continuum of care.

Student Learning Outcomes:

- * Describe health promotion activities in public health.
- * Classify injury prevention activities in public health.
- * Contrast chronic disease management in public health.
- * Critique the outcomes of a community paramedic program.
- * Recognize the divide between a culture and individual identity.
- * Examine how culture affects the health of an individual.
- * Discuss how culture can impact the access to healthcare services.

(3 C: 3 lect/pres, 0 lab, 0 other)

IHCP 2020 - Community Assessment, Resources, and Interaction

The Community Paramedic will assess the needs of the community and develop resources necessary for managing patients in the healthcare continuum. The Community Paramedic will understand the importance of balancing stress and wellness while ensuring their personal safety.

Student Learning Outcomes:

- * Evaluate the needs of their community.
- * Differentiate the types of community safety nets.
- * Implement a resource map.
- * Discuss the purpose of community outreach
- * Identify the effects and elements of wellbeing and stress.
- * Develop a plan to combat stress.
- * Support actions that can reduce stressful interactions with patients.
- * Compare strategies to maintain professional boundaries.

(3 C: 3 lect/pres, 0 lab, 0 other)

IHCP 2025 - Community Paramedic Internship

The student learner will incorporate the materials and resources identified in the classroom to the clinical environment. The student will work with preceptors in the clinical or simulated environment to identify a care plan, assess, manage, and document the needs of the patient in the healthcare continuum.

Student Learning Outcomes:

- * Evaluate the needs of their community.
- * Establish a care plan for the patient.
- * Provide a physical assessment of the patient.
- * Conduct a patient interview.
- * Identify resources for the patient.
- * Document the needs and care provided during the assessment.
- * Discuss the effects and components of wellbeing and stress.
- * Construct strategies to maintain professional boundaries.

(4 C: 0 lect/pres, 0 lab, 4 other)

INTS 1150 - On Course

Strategies (including tools and skill development) to help students create greater success in college and in life are introduced in this course. The course provides an interactive environment for students to identify their motivations and opportunities for personal growth, engage in academic and career goal and decision making, and explore campus resources and services. Through these tools, skills, resources, and services, students are empowered to take ownership and control of their academic and personal life outcomes and experiences.

Student Learning Outcomes:

- * Recognize how to take personal responsibility, gaining greater control over the outcomes and experiences created both in college and in life
 - * Conceive greater inner motivation by discovering their own personally meaningful goals
 - * Identify and employ numerous strategies for taking control of their time and energy, allowing them to move more effectively and efficiently toward the accomplishment of their goals and dreams
 - * Create and develop mutually supportive relationships that will support them to achieve their goals and dreams as they assist others to achieve theirs
 - * Identify and revise self-defeating patterns of behavior, thought, and emotion as well as unconscious limiting beliefs
 - * Recognize and use effective strategies for managing distressing emotions and increasing an inner sense of well being and happiness
 - * Describe how to develop self-acceptance, self-confidence, self-respect, self-love, and unconditional self-worth
 - * Demonstrate improved writing skills through the extensive writing practice offered by guided journal entries
 - * Define methods, tools, and thinking skills essential for analyzing and solving problems in academic, professional, and personal lives
 - * Identify the personal qualities and skills that employers identify as essential for excelling in the world of work
 - * Synthesize identified services, resources, tools, and skills for individual success
- (1 C: 1 lect/pres, 0 lab, 0 other)

INTS 1155 - Student Success Seminar

The intent of the course is to acquaint students with higher education and assist them in reaching their educational objectives. Students will demonstrate self-management skills and identify strategies and resources that can aid in their academic success, personal development, and goal identification and attainment. Students will be empowered to take ownership and control of their academic and personal life outcomes.

Student Learning Outcomes:

- * Create an individual definition of success and a working plan for achieving it.
 - * Identify effective learning strategies to increase preparedness for tests, improve test-taking skills, and increase information retention.
 - * Demonstrate short-term, mid-term, and long-term personal and academic goal-setting and the ability to reflect upon and adapt as needed.
 - * Demonstrate time management by assessing and prioritizing commitments to maximize college success.
 - * Identify and investigate academic programs of interest and plan and track academic progress.
 - * Identify and manage external and internal distractions in an effort to improve concentration.
 - * Identify and implement effective strategies for health and wellness and stress management.
 - * Identify general career aptitudes, values, and interests via completion of a variety of career assessment instruments.
 - * Demonstrate effective oral and written communication skills through written assignments, discussion, group work, and oral presentation.
 - * Locate and use support services and resources such as the library, CAS, TRiO, academic advisors, counselors, disability services, and career services.
- (2 C: 2 lect/pres, 0 lab, 0 other)

LSCE 1502 - Surveying Principles I

The students will study error analysis and measurements, random errors, survey standards and specifications. Focus will also be on state plane coordinate calculations, development of coordinate geometry, trigonometric solutions, geodetic surveying problems, and positioning of corners per Public Land Survey System. Students will study historical development, description and land boundary elements related to platting, deed interpretation and boundary systems.

Student Learning Outcomes:

- * Locate and calculate positions of government and property corners according to Federal, State, and local established guidelines.
 - * Analyze and compute traverse adjustments and section breakdowns.
 - * Examine the Public Land Survey System, convergence and error propagation.
 - * Perform analysis of historical land surveys.
 - * Apply coordinate geometry functions.
 - * Interpret boundary rights.
- (3 C: 1 lect/pres, 2 lab, 0 other)

LSCE 1506 - Advanced Survey

Students will study advanced distance, angle and elevation work, including traverse layout, topographic data collection, x-sections and profiles, horizontal and vertical curves, property line surveying, and precise leveling. This course includes practical field applications including conventional total station, robotic total station, GPS, data collector and data transfer.

Student Learning Outcomes:

- * Demonstrate basic and complex field surveys.
 - * Analyze precise level loops and traverses.
 - * Perform topographic surveys with total stations and controllers.
 - * Transfer data to PC for use in preliminary design.
 - * Calculate survey closures, levels of classification and coordinate geometry computations.
 - * Convert field data to record data in the form of drawings, sketches and field book files.
 - * Demonstrate ability to effectively communicate with others in a group situation.
- Prerequisite(s): LSCE1530.
(5 C: 1 lect/pres, 4 lab, 0 other)

LSCE 1510 - Civil Drafting Methods

Introduce key concepts of surveying and civil engineering industry related to drafting and design methods. Develop technical skills in map making and construction document drafting and civil engineering drafting techniques.

Student Learning Outcomes:

- * Demonstrate proper hand and computer aided drafting methods and skills.
 - * Prepare drafting documents.
 - * Design and create contour, profile and cross section drawings.
 - * Comprehend survey and construction terms associated with cross sections, profiles, grades and coordinates.
 - * Exhibit safe work habits, safe equipment handling and professional interpersonal skills.
 - * Identify and employ correct drafting tools and use scaling devices accurately.
 - * Apply fundamental CADD drafting methods to create drawings.
- (3 C: 2 lect/pres, 1 lab, 0 other)

LSCE 1514 - Civil CADD I

Students will develop knowledge of system configuration, hardware operations and interactive graphics software (Autodesk). Students will input drafting commands to develop civil/survey drawings, store data and produce digital drawings. Students will be introduced to Autodesk Civil3D and data collection applications.

Student Learning Outcomes:

- * Apply fundamental CADD drafting methods to create drawings.
 - * Create digital drawings using Autodesk drafting and design programs.
 - * Demonstrate fundamental CADD editing techniques to modify drawings to accurately convey information.
 - * Perform dimensioning, hatching and plotting functions.
 - * Evaluate survey field data collector files and insert into CADD drawings.
 - * Work cooperatively with group members.
- Prerequisite(s): LSCE1510. (3 C: 1 lect/pres, 2 lab, 0 other)

LSCE 1518 - Materials, Estimating, and Specifications

Students will study and practice procedures for estimating quantities and costs as they relate to public works projects. Topics include concrete and asphalt estimating in the preliminary, final and as-built phases of construction. Students will be introduced to materials testing as well as study construction materials, construction methods, inspection and quality control. The students will explore standard contracts and specification documents.

Student Learning Outcomes:

- * Review construction and material terms.
 - * Interpret plans and specifications.
 - * Perform materials testing procedures.
 - * Evaluate and analyze testing results through written reports.
 - * Identify construction procedures as related to civil engineering and land surveying.
 - * Estimate cost and materials for civil engineering projects.
 - * Determine technician, designer and inspector duties as required for civil engineering.
 - * Compute earthwork, area, volume and linear distances as related to civil engineering.
- (3 C: 1 lect/pres, 2 lab, 0 other)

LSCE 1527 - Technical Computations II

Students will study the natural laws that govern the relationship between work, force, and motion. Students will apply this knowledge through practical lab experiments and problem solving. Students will perform computations in the civil engineering/land surveying field. These include: volumes, bearings/azimuths, latitudes/departures, area traverse and various curve calculations. Students will also study elementary concepts involving coordinate geometry and route-survey methods.

Student Learning Outcomes:

- * Calculate physics problems involving force, equilibrium, and accelerated motion.
 - * List and explain horizontal and vertical curve terminology.
 - * Compute vertical curve calculations.
 - * Perform horizontal curve calculations.
 - * Calculate traverse adjustments.
 - * Apply industry standards to highway design computations.
- Prerequisite(s): MATH1300 or TECH1545. (3 C: 2 lect/pres, 1 lab, 0 other)

LSCE 1530 - Survey Fundamentals

Students will study basic surveying with practical applications in horizontal distance, angle and vertical measurement, introduction to total station/data collection, traverse angle and distance measurement methods. The student will begin using coordinate geometry. This course includes extensive fieldwork.

Student Learning Outcomes:

- * Perform distance measurements related to plane surveying and apply appropriate corrections
 - * Perform angle measurements and apply appropriate corrections
 - * Perform vertical distance measurements and apply appropriate corrections
 - * Use mathematical computations to deal with measurement uncertainties
 - * Work cooperatively in a work group environment
 - * Identify Minnesota tree types
 - * Create survey field notes
- (5 C: 1 lect/pres, 4 lab, 0 other)

LSCE 2502 - Control and Digital Surveys

Students will focus on preliminary and final survey procedures in gathering information through total station and automated data collection procedures. Subjects include centerline profiles, cross sections, radial topography, Alberta (ALTA) requirements, CADD drafting, advanced traversing, triangulation, resection, areas, volumes, section breakdown and subdivision surveys. Field projects will use conventional total station, robotic total station, GPS and data collection procedures.

Student Learning Outcomes:

- * Demonstrate ability to perform ALTA surveys.
- * Examine ALTA survey requirements and calculations.
- * Perform leveling processes, procedures and adjustments.
- * Model effective communication in assigned work groups.
- * Calculate metes and bounds property locations.
- * Break down Public Land Survey System (PLSS) standard section.
- * Evaluate PLSS and GPS practices.
- * Compute calculations concerning PLSS property locations.
- * Prepare electronic CADD drawings from data collection.
- * Apply CADD drafting information to field operations.

Prerequisite(s): LSCE1506.

(5 C: 1 lect/pres, 4 lab, 0 other)

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LSCE 2506 - Construction Design and Surveying Principles

Students focus on construction survey techniques and systems used in construction projects. Students will use practical field techniques for staking centerline profile, slope and grade staking, sanitary and storm sewer, curb and gutter, water mains, buildings and some aspects of platting. Emphasis will be on construction staking with the total station, GPS systems, and traditional surveying methods. Student Learning Outcomes:

- * Generate calculations required prior to staking a project and those required after staking a project.
- * Plan and stake an underground utility project.
- * Plan and stake road grades, slope stakes and curbing.
- * Plan and stake various building pads, buildings, site work, and houses.
- * Conduct field survey of subdivision lots and boundary.
- * Demonstrate respectful communication and proper interaction in a work group environment.
- * Analyze record drawings of engineered projects.

Prerequisite(s): LSCE2502.

(5 C: 1 lect/pres, 4 lab, 0 other)

LSCE 2510 - Surveying Principles II

Students study Minnesota State Statutes, and county and city ordinances relating to platting and surveying methods, along with techniques for record research. Emphasis is also on writing land descriptions and easement descriptions. Students study professional duties of the land surveyor and civil engineer. Topics include re-tracing land boundaries, riparian rights, land and easement descriptions, platting, survey evidence, metes and bounds and Public Land Survey Systems. Student Learning Outcomes:

- * Read, interpret and prepare land descriptions.
- * Identify client-consultant-agency-contractor expectations and requirements.*
- * Demonstrate fundamentals of the Public Land Survey System (PLSS).
- * Examine professional practices and ethics relating to civil engineering and land surveying.
- * Determine boundary control and legal principles and their relationship to the land survey.
- * Analyze research methods used in property retracement.

Prerequisite(s): LSCE2526.

(3 C: 1 lect/pres, 2 lab, 0 other)

LSCE 2514 - Civil CADD II

Students will focus on interactive Computer Aided Drafting and Design software (Autodesk Civil3D) applications as they relate to basic principles of drawing and design of civil/survey projects. Students will focus on coordinate geometry, mapping, digital terrain modeling, platting, detail drafting and design using CADD methods.

Student Learning Outcomes:

- * Draw, dimension and detail survey plat maps using coordinate geometry.
- * Download field survey data using various automated mapping tools.
- * Create triangulated irregular network (TIN) models.
- * Modify surfaces with breaklines.
- * Produce description key symbols.
- * Produce American Land Title Association (ALTA) maps.
- * Design roadway alignments and profiles.

Prerequisite(s): LSCE1527.

(3 C: 1 lect/pres, 2 lab, 0 other)

LSCE 2518 - Utility Design I

Students will study fluid mechanics. The focus will be on fluid flow characteristics of gravity sanitary sewer and storm sewer systems. Students will study storm water hydrology, storm water management, and various wetland issues. Students will design storm sewer systems including piping, inlet structures, storm water facilities, storm water treatment pond, and prepare plan and profile documents. See Student Learning Outcomes:

- * Assess various hydrology methods used to estimate watershed runoff.
- * Calculate pipe flow and open channel flow geometry and flow quantities.
- * Design storm water collection system and create plan and profile drawings and related appurtenance details.
- * Design a storm water treatment pond based on site runoff.
- * Create erosion control documents using current National Pollutant Discharge Elimination System (NPDES) requirements.

- * Interpret construction specifications.

Prerequisite(s): LSCE1527.

(3 C: 1 lect/pres, 2 lab, 0 other)

LSCE 2522 - Civil CADD III

Students will perform civil engineering and land surveying design tasks using AutoCAD Civil 3D engineering and surveying software. Topics include advanced principles of coordinate geometry, digital terrain modeling, roadway plan and profile, cross sections and earthwork design.

Student Learning Outcomes:

- * Manipulate grading design functions to create grading plans and earthwork functions to compute earthwork volumes.
- * Build assemblies and roadway corridors.
- * Produce survey documents.
- * Design urban street - plan and profile construction documents.
- * Create utility plan and profile construction documents.
- * Transfer survey data to controller for field use.

Prerequisite(s): LSCE2514.

(3 C: 1 lect/pres, 2 lab, 0 other)

LSCE 2526 - Subdivision Design

Students will focus on subdivision design. Topics include plat layout, grading and earthwork, hydrology, road design, and storm water management. Students will study wetland issues, existing land use factors, zoning considerations, Minnesota State Statutes and local ordinances as they relate to platting. Techniques for record research will also be discussed.

Student Learning Outcomes:

- * Analyze subdivision design constraints found in the State Statutes and in various County, City and local ordinances.
- * Apply design constraints to develop sketch plats.
- * Design a preliminary plat.
- * Design horizontal and vertical alignment of roadways, including vertical curves, horizontal curves and other geometric elements of roadway design.
- * Produce grading plans and roadway construction documents.
- * Interpret construction specifications.

Corequisite(s): LSCE2514

Prerequisite(s): LSCE1502.

(4 C: 3 lect/pres, 1 lab, 0 other)

LSCE 2530 - Utility Design II

Students will study fluid mechanics and flows in both gravity and pressure systems. Focus is on flow characteristics in sanitary sewer systems, storm water systems, and water supply systems. Students will design a storm sewer drainage system and model storm water runoff. Students will calculate a quantity takeoff and cost estimate for their housing subdivision.

Student Learning Outcomes:

- * Design a sewer collection system for an engineered project, selecting proper materials, slopes, quantities, capacities and system sizing.
- * Design a water distribution system for an engineered project, selecting proper materials, slopes, quantities, capacities and system sizing.
- * Design a storm water collection system for an engineered project, selecting proper materials, slopes, quantities, capacities and system sizing.
- * Develop construction documents for a utility construction project.
- * Produce a drainage report for a housing subdivision project.
- * Prepare a quantity takeoff and cost estimate of their housing subdivision.

Corequisite(s): LSCE2522

Prerequisite(s): LSCE2518, LSCE2526.

(3 C: 1 lect/pres, 2 lab, 0 other)

MACH 1503 - Machine Tool Technology I

This course will address the operations of a drill press, pedestal grinder, vertical mill, lathe, and band saws. Machine safety, machine component identification, as well as turning, milling, sawing, bench, drilling and off-hand grinding projects are also included in the components listed above. The student will also learn the care and use of inspection and layout tools.

Student Learning Outcomes:

- * Completion of milling projects on vertical mill
- * Completion of various lathe projects on the engine lathe

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

- * Completion of bench projects utilizing hand tools
 - * Understand the importance of proper machine setup
 - * Proficiency using bandsaws to complete machining projects
 - * Completion of drilling projects on metalworking equipment
 - * Proficiency in operation and setup of pedestal grinder
 - * Proficiency in using linear measuring tools such as scales, micrometer, and vernier and digital calipers
 - * Application of safe work habits around all metalworking equipment and co-workers
- (4 C: 1 lect/pres, 3 lab, 0 other)

MACH 1507 - Machining Math

This applied mathematics course is for students pursuing a diploma in Machine Tool Technology. The primary goals of this course are to help individuals acquire a solid foundation of basic skills in algebra, geometry and trigonometry as applied to the machining field. Problem solving will be emphasized in the geometry, trigonometry, compound angle and numerical control sections.

Student Learning Outcomes:

- * Solve problems that involve combined operations of fractions and decimals.
 - * Compute ratio and proportions
 - * Perform arithmetic operations with customary and metric linear units and compound numbers
 - * Simplify and solve Algebraic expressions that involve combined operations
 - * Apply geometric principles to solve practical problems involving circles and common polygons.
 - * Calculate angles and sides of right triangles using the functions of Trigonometry.
 - * Determine program dimensions using incremental and absolute positioning.
- (4 C: 2 lect/pres, 2 lab, 0 other)

MACH 1510 - Machine Tool Technology II

This course will cover additional skill development in the setup and operation of saws, milling machines, lathes and drill presses. More complex machining tasks will be included in mill, drill machining and lathe machining projects. Introductory open setup inspection and layout exercises will be performed in the inspection area. Additional inspection tools and equipment will be used as they relate to checking project dimensions.

Student Learning Outcomes:

- * Completion of drilling, boring, jig boring, parallel and step milling projects utilizing milling machine
- * Completion of facing, turning, external threading, taper turning projects utilizing engine lathe
- * Completion of drilling projects using upright drill press and radial drill press
- * Completion of precision layout using height gage
- * Develop basic skills using a surface grinder
- * Proficiency using hand tools to complete a bench project
- * Proficiency on off-hand grinding of drill bits and lathe toolbits
- * Develop and apply safe work habits around all metalworking equipment and co-workers
- * Proficiency using direct and indirect measurement tools

Prerequisite(s): MACH1503.

(4 C: 1 lect/pres, 3 lab, 0 other)

MACH 1511 - Machine Tool Technology III

This course will address the advanced operations and setups of milling machines, lathe and surface grinders. Machine safety and machine component identification are also a part of the components listed above. The student will perform part layout, as well as slot and pocket milling, taper turning, boring, drilling and grinding projects. The student will become familiar with advanced setup and operations on the lathe, milling machine, drill press and grinding machines. The student will also learn the care and use of different tooling used in the lathe, milling machines, and surface grinders.

Student Learning Outcomes:

- * Produce projects requiring indexing, keyway cutting, radius, boring, pocket and slot milling utilizing a milling machine
- * Create projects on the engine lathe that will produce tapers, external and internal threads and bored features.
- * Construct setups and precision grind surfaces on projects utilizing a surface grinder.

- * Manufacture milling projects that require surface, side, and angular milled features utilizing a milling machine
- * Demonstrate competency in using measurement standards for machine setups and inspection purposes
- * Inspect part features using inside-, depth- and height measuring equipment to include optical measuring devices.
- * Develop and apply safe work habits around all metalworking equipment and co-workers.

Prerequisite(s): MACH1510.

(5 C: 1 lect/pres, 4 lab, 0 other)

MACH 1514 - Introduction to Swiss Turning

This course is an introduction course to Swiss machining and programming. Upon completion of this course the student will be familiar with Swiss turning machine equipment, components, features, tooling, set-up and programming. Several units of advanced inspection procedures and equipment will be part of this course.

Student Learning Outcomes:

- * Develop and apply safe work habits around Swiss turning equipment and co-workers.
- * Compare the difference between conventional turning and the concepts of Swiss Machining.
- * Setup Swiss machines and bar feeder
- * Identify tool holding components, tool holding devices and equipment used in Swiss machining.
- * Create a number of programs manually and using CAM software that will machine a part to the blueprint specifications.
- * Inspect machine parts and edit programs and offsets to machine the part to the blueprint specifications.
- * Demonstrate the ability to use the computer to send and receive programs to the CNC machine.

Corequisite(s): MACH1511

Prerequisite(s): MACH1510.

(2 C: 0 lect/pres, 2 lab, 0 other)

MACH 1517 - Blueprint Reading I

This course will cover the basic principles of blueprint reading that will include three view drawings, the types of lines and view arrangements, dimensioning, types of tolerancing, surface textures, and classification of fits.

Student Learning Outcomes:

- * Interpret different lines
 - * Understand view arrangements
 - * Proficiency in reading blueprints
 - * Interpret dimensioning
 - * Interpret surface texture callout
 - * Interpret classification of fits
- (1 C: 0 lect/pres, 1 lab, 0 other)

MACH 1519 - Blueprint Reading II

The student will interpret intermediate level blueprints involving orthographic views, section views and cutting planes. Special views, datums, welding symbols and sketching are also emphasized.

Student Learning Outcomes:

- * Interpret revolved and removed sections
 - * Interpret multiple view drawings
 - * Develop understanding of tolerancing methods
 - * Interpret projection views
 - * Interpret primary and auxiliary views
 - * Interpret datums and applications
 - * Interpret assembly drawings
- Prerequisite(s): MACH1517, MACH1503.

(1 C: 0 lect/pres, 1 lab, 0 other)

MACH 1525 - Geometric Dimensioning and Tolerancing

This course is designed to allow students to interpret the latest ANSI Y 14.5 drawing standard that applies to blueprint standards. Students will learn the symbols, rules and geometric controls shown on today's blueprints. Students will be given prints and exercises to enhance their skills in print reading. Job seeking

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and keeping information will also be provided for students.

Student Learning Outcomes:

- * Understand ANSYS Y14.5 standards that effect geometric dimensioning and tolerancing
 - * Proficiency in using geometric dimensioning and tolerancing symbols and controls
 - * Experience in reading blueprints that utilize geometric dimensioning and tolerancing controls
 - * Decipher how piece-parts must be inspected if the features have GDandT symbols and controls
 - * Complete on a sketch pertinent feature control frames on a part's features(s) to symbolize exact GDandT symbols and necessary modifiers
 - * Demonstrate an awareness of the shortcomings of any drawing, which has been produced in conventional drawing practices, and provide alternative solutions with GDandT symbology
 - * Job seeking and keeping requirements
- (1 C: 0 lect/pres, 1 lab, 0 other)

MACH 1528 - Jigs and Fixtures

This course is designed to familiarize the student with basic types and functions of jigs and fixtures used in metalworking industries. Various workholding types from simple soft jaws to modular workholding systems will be examined. Design principles, which explore simplicity and economy, are considerations, which are discussed in the course.

Student Learning Outcomes:

- * Understand the various types of drill jigs used in production drilling applications
 - * Understand the various types of fixtures used in production machining applications
 - * Proficiency in using the correct jig or fixture for the part being machined
 - * Experience in determining how soft jaws must be bored or machined to hold any part configuration
 - * Describe the type of steel or metal which should be used to build various jigs and fixtures
 - * Ability to identify all common types of locators and supports used with jigs and fixtures
 - * Experience in deciphering various screws and pins used in conjunction with jigs and fixtures
- (1 C: 1 lect/pres, 0 lab, 0 other)

MACH 1532 - CAM I 2D

This course is intended for Machine Tool Technology students to provide an introductory level understanding of computer assisted programming software. The student will create 2 dimensional geometry and progressing into toolpath creation.

Student Learning Outcomes:

- * Demonstrate ability to open and save files
- * Create two dimensional lines and arcs of part geometry
- * Modify two dimensional geometry, deleting, chamfering, filleting
- * Create G,M code NC code with Post Processor

Prerequisite(s): TECH1550.

(1 C: 1 lect/pres, 0 lab, 0 other)

MACH 1540 - CNC Fundamentals

This is an introduction to programming and set up of CNC vertical milling centers (VMCs) and turning centers (TCs) course. The students will learn the basics of the word address system as applied to CNC machines. Students will set up and operate CNC machines to machine parts they manually programmed. Students will safely prove their programs and set ups using simulation, single block and machine offsets with the end goal of producing quality first run parts.

Student Learning Outcomes:

- * Program straight line external contour milling/turning with and without cutter compensation.
- * Program drilling with and without canned cycles.
- * Load, locate and input tool offsets.
- * Locate and input work offsets.
- * Safely prove their programs and set ups using simulation, single block and machine offsets to produce quality first run parts.

(2 C: 1 lect/pres, 1 lab, 0 other)

MACH 2504 - CNC Milling/Turning

This is the foundational programming and set up of CNC vertical milling centers (VMCs) and turning centers (TCs) course. The students will learn the word address system as applied to VMCs and TCs. Students will set up and operate equipment to machine parts they manually programmed. Students will safely prove their programs and set ups using simulation, single block and machine offsets with the end goal of producing quality first run parts.

Student Learning Outcomes:

- * Program straight line external and internal contour milling and turning with and without cutter compensation.
- * Program drilling, tapping, threading and boring with and without canned cycles.
- * Program bolt patterns and pocket milling with and without canned cycles.
- * Load and set up work holding devices for VMCs and TCs.
- * Choose appropriate tooling and work holding devices form multiple styles of VMC and TC work.
- * Load and set up work holding devices in VMCs and TCs.
- * Load, locate and input tool offsets into VMCs and TCs.
- * Locate and input work offsets into VMCs and TCs.
- * Safely prove their programs and set ups using simulation, single block and machine offsets to produce quality first run parts.

Prerequisite(s): MACH1540.

(4 C: 1 lect/pres, 3 lab, 0 other)

MACH 2510 - Cutting Tool Technology

This course will emphasize the identification and use of standard and special cutting tools. Conventional cutting tools will be examined as to their application in machining. Carbides, cermets, diamond and cubic boron carbide type cutting inserts will be examined as to their use in machining and manufacturing.

Student Learning Outcomes:

- * Understand the various grades and number system of carbide cutting tools
 - * Proficiency in using the correct carbide tool for the material being machined
 - * Experience in determining which cutting tool will work best to machine features found on the blueprint
 - * Decipher the identification of lathe toolholders and their correct inserts
 - * Identify all common cutting tools used in lathe, mill and drill machining applications
 - * Proficiency in identifying and using a broach and shims to produce an internal keyway
 - * Experience in determining cutting speeds and feeds for a variety of cutting tools used in the machining industry
- (1 C: 1 lect/pres, 0 lab, 0 other)

MACH 2512 - CAM II 3D/Solid Modeling/Turning

This course advances the geometry creation techniques covered in CAM I 2D. 3D geometry creation is used extensively as well an introduction to 3D Solid Modeling creation and uses. More advanced design and toolpath techniques are covered. Geometry creation for the lathe will be covered. This geometry will be required for CNC Turning centers.

Student Learning Outcomes:

- * Create two dimensional lines and arcs of part geometry silhouette needed for turning.
- * Modify two dimensional geometry, deleting, chamfering, filleting.
- * Create G, M code NC code with Post Processor.
- * Create 3D Solid part model using: Revolve, Extrude, Fillet and Boolean operators.
- * Generate toolpaths from 3D solid models.
- * Apply CAM high feed functionality.
- * Create tool lists and active reports for set-up documentation.

Prerequisite(s): MACH1532.

(2 C: 2 lect/pres, 0 lab, 0 other)

MACH 2514 - Metallurgy

This course will examine various steels and non-steel metals and their mechanical properties. Other types of materials such as castings, forgings and powdered metal (P/M) materials will also be analyzed. Lab work will consist of performing a tensile test on a metal, hardness testing, and the heat-treat of a steel workpiece. Heat treat applications will also be an important segment of the course.

Student Learning Outcomes:

- * Understand steel types and their application in the metalworking industry

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

- * Proficiency in using correct tests to determine tensile strength and hardness of metals and materials
- * Experience in determining which hardness scale to use for different hardness and types of metals and non-metals
- * Conduct simple tests to determine relative hardness and composition of various metals
- * Utilize charts to distinguish hardness scales for unlike metals
- * Proficiency in recognizing different methods of producing parts including castings, forgings, weldments, machined bar stock, extrusions and powdered metals (1 C: 0 lect/pres, 1 lab, 0 other)

MACH 2516 - CAM III Multi-Axis Programming

This course introduces 4 and 5 axis milling and multiaxis Mill-Turn equipment programming. Emphasis will be towards the advanced milling and turning requirements of the modern machining industry. Fewer setups for finished parts, machining of multiple sides of a part, reduced second operations and mill-turn specialized requirements will be covered.

Student Learning Outcomes:

- * Analyze imported solid geometry.
- * Interpret geometry levels and solid creation history.
- * Establish stock setup settings.
- * Generate toolpaths for 5 axes of CNC Machining.
- * Inspect toolpath simulations using three methods to check for accuracy.
- * Create set-up geometry for live tooling turning centers.
- * Generate toolpaths for live tooling turning.

Prerequisite(s): MACH2512.

(2 C: 2 lect/pres, 0 lab, 0 other)

MACH 2519 - Advanced CNC Milling

This course will cover more advanced CNC set-up and operation techniques. Emphasis will be on the use of fixtures and the reduction of second operation requirements. Industry standard production fixtures will be manufactured and used.

Student Learning Outcomes:

- * Explain multiple fixture offsets.
- * Explain toll length offsets.
- * Prepare stock blanks for production run of parts.
- * Produce Soft Jaw fixturing.
- * Produce plate fixture.
- * Solve multiple part set-up procedures.
- * Design set-ups for 4th axis machining.
- * Prepare documentation of set-up, tooling and inspection.

Prerequisite(s): MACH2504.

(2 C: 0 lect/pres, 2 lab, 0 other)

MACH 2523 - High Performance Manufacturing

This course is designed to help students understand how high performance manufacturing facilities are able to operate. The practical use of basic quality management as well as production tools and procedures will be explored. Students will engage in the use of various statistical process control methods.

Student Learning Outcomes:

- * Identify how tools and equipment are used in high performance manufacturing.
- * Explain the purpose of preventative and predictive maintenance.
- * Explain the need for equipment standards.
- * Identify the key elements of production planning.
- * Explain the concept of work flow.
- * Identify the costs of inventory.
- * Specify what should be included in a time and cost estimate of production.
- * Identify the key differences between a push and pull system.
- * Identify the purpose of a control chart.
- * Explain the key element of a quality system.

(1 C: 1 lect/pres, 0 lab, 0 other)

MACH 2527 - Advanced CNC Turning

This course will cover more advanced CNC lathe set-up and operation techniques. Emphasis will be on multi operation parts. Specialized soft jaw turning and boring, tailstock relocation and stock advancement with stops will be covered.

Student Learning Outcomes:

- * Explain multiple fixture offsets.
- * Explain tool radius, wear and geometry offsets.
- * Prepare stock blanks for production run of parts.
- * Produce Soft Jaw fixturing.
- * Multiple end cut set-up procedures.
- * Prepare documentation of set-up, tooling and inspection.

Prerequisite(s): MACH2504.

(2 C: 0 lect/pres, 2 lab, 0 other)

MACH 2528 - Introduction to Electrical Discharge Machining

Students in this course will explore the technology of EDM. Students will setup, operate and program these machines to produce parts to blueprint requirements.

Student Learning Outcomes:

- * Demonstrate safety habits consistent with industry standards and college policy.
- * Set-up and operate CNC EDM and Manual EDM machines.
- * Setup and operate EDM sinker machines.
- * Program CNC Wire EDM machines.
- * Explain the code necessary for programming multiple axes for CNC wire machines.
- * Explain the reasons for using different electrodes to cut various materials.

(2 C: 1 lect/pres, 1 lab, 0 other)

MACH 2531 - Multiaxis VMC

This course will add 5 axis Machining center programming and setup techniques. The student will determine, identify and indicate X-Y-Z-A and B axis datum for multiple setups.

Student Learning Outcomes:

- * Explain multiple fixture offsets
- * Examine part set-up requirements
- * Calculate work offset shifts in A and B axes
- * Determine tooling requirements
- * Determine fixturing for Multiaxis environments
- * Solve multiple part set-up procedures
- * Design set-ups for 5 axis machining
- * Prepare documentation of set-up, tooling and inspection

Prerequisite(s): MACH2504.

(2 C: 0 lect/pres, 2 lab, 0 other)

MACH 2535 - Live Tooling Turning Centers

This course will introduce Live Tooling and Multi-axis turning, programming and setup techniques.

Student Learning Outcomes:

- * Explain multiple axis tooling offsets.
- * Explain tool radius, wear and geometry offsets.
- * Prepare stock blanks for production run of parts.
- * Produce Soft Jaw fixturing.
- * Explain C-Axis indexing.
- * Prepare documentation of set-up, tooling and inspection.

Prerequisite(s): MACH2504.

(2 C: 0 lect/pres, 2 lab, 0 other)

MACH 2539 - Advanced Electrical Discharge Machining

This course is intended to give the student an opportunity to learn advanced concepts and machining techniques associated with electrical discharge machines. Students will setup, operate and program these machines to produce parts to blueprint requirements.

Student Learning Outcomes:

- * Demonstrate safety habits consistent with industry standards and college policy.
- * Program using CAM software and two and four axis programs.
- * Setup and operate EDM manual sinker machines.
- * Program CNC wire EDM CNC machines.
- * Perform setups using sinker and wire EDM tooling.
- * Build electrodes for EDM sinker operations using reference system chuck adapter.
- * Generate sinker EDM programs using special electrodes.

Prerequisite(s): MACH2528.

(1 C: 0 lect/pres, 1 lab, 0 other)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

MACH 2540 - Advanced Swiss CNC Turning

This course is intended to give the student an in-depth experience in Swiss cnc turning. The students time will be spent learning the programming software and advanced programming language necessary to complete multi-axis and multi-operations on the machine. Introduce using the pick-off (A2) spindle, back/front tools and live tools. The use of special Swiss cnc cutting tools will be emphasized. The use of high precision inspection tools such as optical comparators and high precision measuring tools will be an integral part of the course.

Student Learning Outcomes:

- * Develop safety habits consistent with industry standards and college policy.
- * Setup Swiss CNC turning centers including tooling and bar feeder.
- * Write setup and run CNC programs utilizing gang tools, live tools, and front and back tools.
- * Examine tooling, programs and offsets to correct or modify programs.
- * Utilize inspection equipment to inspect critical dimensions.
- * Establish code necessary for simultaneous tool cutting operations.
- * Identify the critical components and functions of Swiss CNC machines.

Corequisite(s): MACH2504

Prerequisite(s): MACH1514.

(2 C: 0 lect/pres, 2 lab, 0 other)

MACH 2542 - CNC Milling Setup and Operations with 4th Axis

This course is a continuation of programming and set up of vertical machining centers (VMCs) with emphasis on production and operation skills include the addition of the 4th axis. The students will advance and reinforce the word address system as applied to VMCs. Students will set up and operate VMCs to machine parts they manually programmed and parts preprogrammed with CAM. Students will safely prove their programs and set ups using simulation, single block and machine offsets with the end goal of producing quality first run parts. The students will then create and systematically organize their own programs and setup sheets to be ran again by other students later in the course.

Student Learning Outcomes:

- * Program multiple operation parts on VMCs.
- * Setup multiple operation parts on VMCs.
- * Correctly and safely complete quality first run parts.
- * Create and organize their own programs and setup sheets for future operation by other students.
- * Given another students proven program and detailed setup sheets students will setup and safely complete a quality first run part.

Prerequisite(s): MACH1531, MACH2504, MACH1540.

(4 C: 1 lect/pres, 3 lab, 0 other)

MACH 2544 - CNC/CAM Capstone

Students will engage in advanced machining activities encompassing all areas of CNC and CAM. Course focus will include: 4th axis programming and part development on machining centers; drawing solid models using CAM systems; utilizing the drawings to develop.stl files, and building the shape using a 3D printer.

Student Learning Outcomes:

- * Define solid model of a part and its uses
- * Perform 4th axis setup on machining center and produce 4th axis machining operation
- * Draw a solid model using CAM systems and produce a.stl file for model development
- * Produce 4 axis shaped parts using a CAM system and burn on CNC Wire-EDM machine
- * Understand the benefits of tool mapping on machining center programs
- * Examine tool life variables and set in CNC program
- * Draw 4th axis shaped part for milling on CAM system
- * Create a 3D part using surface modeling
- * Produce multiple part shapes from a single blank on CNC Wire-Feed EDM
- * Import CAD.dxf file for CNC machining purposes
- * Create an advanced surface milling program

(1 C: 0 lect/pres, 1 lab, 0 other)

MACH 2545 - CNC Turning Setup and Operation

This course is a continuation of programming and set up of turning centers (TCs) with emphasis on production and operation skills. The students will advance and reinforce the word address system as applied to TCs. Students will set up and

operate TCs to machine parts originally programmed and parts preprogrammed. Students will safely prove their programs and set ups using simulation, single block and machine offsets with the end goal of producing quality first run parts. Students will create and systematically organize original programs and setup sheets.

Student Learning Outcomes:

- * Program multiple operation parts on TCs.
- * Setup multiple operation parts on TCs.
- * Create and organize original programs and setup sheets.
- * Setup and run multiple proven programs.
- * Run quality first run part utilizing a proven program
- * Run quality first run part utilizing an original program.
- * Correctly update revisions made to programs during initial operations.
- * Correctly update revisions made to setups during initial operations.

Prerequisite(s): MACH2504.

(4 C: 1 lect/pres, 3 lab, 0 other)

MACH 2548 - Plastics - Application and Chemistry

This course is for students entering the Moldmaking, Mold Press operator or Mold design occupations. The student will identify different plastic types, explain plastics chemistry, determine plastic types applications and calculate volumes of components for injection molding.

Student Learning Outcomes:

- * Identify plastic types.
- * Compare plastics classifications.
- * Determine plastic types application.
- * Explain chemical change.
- * Explain physical change.
- * Summarize plastics properties and characteristics.

Corequisite(s): MACH2550

(1 C: 1 lect/pres, 0 lab, 0 other)

MACH 2550 - Mold Design Theory

This course will give students an introduction to Plastic Injection Mold designs, applications and processes. Other topics covered will be extrusions, blow molding, Rotary molds and Die Casting.

Student Learning Outcomes:

- * Comparison of plastic types and applications.
- * Identify the names and function of Injection and Die-cast mold components.
- * Describe the different processes for forming plastic components.
- * Describe the components of a basic plastic injection mold.
- * Explain why molds need to be heated and cooled.
- * Explain the operation of a Mold Base.
- * Describe the function of the ejector system.
- * Explain why a cam might be used in an injection mold.
- * Determine different methods of producing cores and cavities.
- * Select the proper types of runner and gating system for different types of injection systems.
- * Select suitable materials for the production of an injection mold.

Prerequisite(s): TECH1550, MACH1511, MACH1532.

(2 C: 1 lect/pres, 1 lab, 0 other)

MACH 2552 - Mold Design Applied

In this course the student will apply injection mold design skills to create working blueprints for a mold to manufacture in the lab.

Student Learning Outcomes:

- * Identify a plastic injection project part.
- * Calculate mold base size requirements.
- * Explain mold component requirements.
- * Calculate plastic injection shot volume.
- * Calculate shrinkage.
- * Contrast construction options.
- * Design mold base.
- * Design Mold Cavity.
- * Design mold force.
- * Design ejection system.

Prerequisite(s): MACH2550.

(2 C: 0 lect/pres, 2 lab, 0 other)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

MACH 2554 - Mold Base, Force and Cavity

In this course the student will machine the Base, Force and Cavity of their injection mold. The base is the foundation of every quality injection mold. The student will select the size required and select materials. The Force and Cavity will be created to fit into the base, they produce the desired shape and characteristics of the final part.

Student Learning Outcomes:

- * Calculate material types and quantities
- * Prepare material sizes according to blueprints
- * Assess fastener and locating hardware requirements
- * Produce mounting and locating holes
- * Compute cavity location requirements.
- * Calculate force alignment location and indexing devices.
- * Produce graphite roughing and finishing tools for machining the cavity.
- * Machine cavity with Electrical Discharge Machine.
- * Produce force with 3D CNC machining center or other as required.
- * Machine locating pockets for force.

Prerequisite(s): MACH2550.

(5 C: 1 lect/pres, 4 lab, 0 other)

MACH 2558 - Ejector System, Runners and Gates

In this course the student will build the system that ejects the molded plastic part from their mold and machine the runners and gates that deliver and meter the hot plastic into the mold cavity. It is also required to calculate cavity volume and material flow characteristics.

Student Learning Outcomes:

- * Calculate ejector pin lengths.
- * Grind ejector pins.
- * Machine ejector system plates.
- * Determine parallel size requirements.
- * Produce parallels.
- * Evaluate ejector system fit and function.
- * Calculate cavity volume.
- * Determine material flow characteristics.
- * Research gate types and uses.
- * Calculate runner size and type.

Corequisite(s): MACH2554

Prerequisite(s): MACH2550.

(4 C: 1 lect/pres, 3 lab, 0 other)

MACH 2562 - Mold Press Operation

In this course the student will setup, operate and troubleshoot a plastic injection molding machine.

Student Learning Outcomes:

- * Calculate plastic volume requirements.
- * Determine injection pressures.
- * Identify temperature settings.
- * Locate holding pressures and timing.
- * Estimate cooling time requirements.
- * Determine cycle times.
- * Analyze injection errors and correction procedures.

(1 C: 0 lect/pres, 1 lab, 0 other)

MATH 0406 - Foundations for College Mathematics

This course is designed to help students improve their arithmetic and introductory algebra skills. Applications and problem solving will be points of emphasis. This is a college readiness course and does not fulfill a college goal area requirement.

Student Learning Outcomes:

- * Apply the basic mathematical concepts that form the foundation of arithmetic and algebra.
- * Utilize procedures for manipulating arithmetic and algebraic expressions and equations.
- * Demonstrate and apply critical thinking skills to solve a variety of problems.
- * Apply arithmetic and algebraic principles appropriately to applications.
- * Utilize a systematic approach to problem solving which incorporates verbal, numeric, visual and symbolic strategies.
- * Communicate mathematical understanding to others verbally and in written form.
- * Expand mathematical reasoning skills and formal logic to develop convincing

mathematical arguments.

Prerequisite(s): Appropriate Placement Score

(2 C: 2 lect/pres, 0 lab, 0 other)

MATH 0420 - Pathway to College Mathematics

This course explores the mathematics content that forms the foundation of elementary algebra and statistics. The course focuses on applications of mathematics, problem-solving skills, and communication about mathematical ideas while incorporating essential skill development for future study. This is a college readiness course and does not fulfill a college goal area requirement.

Student Learning Outcomes:

- * Apply the basic mathematical concepts that form the foundation of algebra and statistics.
- * Translate among verbal, numeric, symbolic, and graphical forms of mathematics.
- * Demonstrate and apply critical thinking skills to solve a variety of problems.
- * Demonstrate basic skills in collecting, organizing, analyzing and interpreting quantitative data.
- * Formulate algebraic representations necessary to model problems.
- * Apply algebraic principles appropriately to applications of algebra and geometry.

- * Utilize a systematic approach in problem solving; differentiate between all possible solutions, and identify the most feasible one.

- * Expand mathematical reasoning skills and formal logic to develop convincing mathematical arguments.

- * Communicate mathematical understanding to others verbally and in written form.

Prerequisite(s): MATH 0406, or Appropriate Placement Score AND READ 0900 or Appropriate Placement Score.

(4 C: 4 lect/pres, 0 lab, 0 other)

MATH 0475 - Principles of Intermediate Algebra

This course is an intermediate course in the principles and applications of algebra. It is formatted for thorough, in-depth concept development. Topics covered include the basics of algebra and modeling; linear equations and inequalities; linear equations in two variables; systems of linear equations; exponents, polynomials, and factoring; rational expressions; introduction to functions; inequalities and problem solving; radical functions and equations; quadratic functions and equations; and exponential and logarithmic functions. A wide variety of examples and exercises are used to help the student connect the mathematical content with the real world. This is a college readiness course and does not fulfill a college goal area requirement.

Student Learning Outcomes:

- * Apply the basic mathematical concepts that form the foundation of algebra.
- * Utilize procedures for manipulating algebraic expressions and equations.
- * Evaluate the reasonableness of solutions attained for problems.
- * Demonstrate and apply critical thinking skills to solve a variety of problems.
- * Formulate algebraic representations necessary to model problems.
- * Apply algebraic principles appropriately to applications.
- * Utilize a systematic approach to problem solving which incorporates verbal, numeric, visual and symbolic strategies.
- * Communicate mathematical understanding to others verbally and in written form.

- * Demonstrate mathematical reasoning skills and formal logic to develop convincing mathematical arguments.

Prerequisite(s): MATH0406 or Appropriate Placement Score.

(4 C: 4 lect/pres, 0 lab, 0 other)

MATH 0485 - Principles of Intermediate Algebra Accelerated

This is a course that will prepare students for Math1300 (College Algebra) by giving them a solid foundation in the principles and applications of intermediate algebra, and by using mathematical tools to analyze and solve problems. It is designed to provide a refresher for students who are borderline between Math 0475 (Intermediate Algebra) and Math 1300 (College Algebra). Although the course content is similar to Math 0475, it is presented in a shorter, more rigorous format than Math 0475. This is a college readiness course and does not fulfill a college goal area requirement.

Student Learning Outcomes:

- * Apply the basic mathematical concepts that form the foundation of algebra.

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

- * Utilize procedures for manipulating algebraic expressions and equations.
 - * Communicate mathematical understanding to others verbally and in written form.
 - * Demonstrate and apply critical thinking skills to solve a variety of problems.
 - * Utilize a systematic approach to problem solving which incorporates verbal, numeric, visual and symbolic strategies.
 - * Expand mathematical reasoning skills and formal logic to develop convincing mathematical arguments.
 - * Apply algebraic principles appropriately to applications.
- Prerequisite(s): Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

MATH 1300 - College Algebra

Meets MN Transfer Goal 4 - Mathematical/Logical Reasoning. The course is designed for students who have sound algebra skills. The primary goals of this course are to help individuals acquire a solid foundation in the basic skills of college algebra and to show how college algebra can be used to model and solve authentic real-world problems. Course topics include an introduction to functions and graphs; linear, quadratic and nonlinear functions with an emphasis on rational expressions, roots and exponents; exponential and logarithmic functions; systems of equations and inequalities; conic sections; sequences and series; and counting and probability.

Student Learning Outcomes:

- * Apply the basic mathematical concepts that form the foundation of algebra
 - * Utilize procedures for manipulating algebraic expressions and equations
 - * Demonstrate and apply critical thinking skills to solve a variety of problems
 - * Apply algebraic principles appropriately to applications
 - * Utilize a systematic approach to problem solving which incorporates verbal, numeric, visual and symbolic strategies
 - * Communicate mathematical understanding to others verbally and in written form
 - * Expand mathematical reasoning skills and formal logic to develop convincing mathematical arguments
- Prerequisite(s): MATH0475 or MATH0485 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

MATH 1321 - College Trigonometry

Meets MN Transfer Curriculum Goal Area 4 -Mathematical/Logical Reasoning. The course is designed for students who have mastered algebra and need to understand trigonometric functions and their applications. The primary goals of this course are to help individuals acquire a solid foundation in the basic skills of college trigonometry and to show how college trigonometry can be used to model and solve authentic real-world problems. It also acts as an entry-level STEM pathway course.

Student Learning Outcomes:

- * Demonstrate and apply basic trigonometric concepts to solve a variety of problems.
 - * Represent and evaluate basic trigonometric information verbally, numerically, graphically, and symbolically.
 - * Communicate mathematical understanding to others verbally and in written form.
 - * Utilize mathematical reasoning skills and formal logic in order to develop convincing mathematical arguments.
 - * Use appropriate technology to enhance mathematical thinking and understanding and to solve mathematical problems, judging the reasonableness of the results.
 - * Use trigonometric functions to prove identities and solve conditional equations.
- Prerequisite(s): MATH1300.
(3 C: 3 lect/pres, 0 lab, 0 other)

MATH 1331 - Applications of Mathematical Reasoning

Meets MN Transfer Curriculum Goal Area 4 - Mathematical/Logical Reasoning. This course is an investigation into the nature of mathematics. Students will apply mathematical principles to varied disciplines including an exploration of a variety of social and global issues. Students will experience mathematics as a creative and evolving discipline. Emphasis will be placed on applications in these topic areas with related statistics concepts developed when appropriate. Spread sheets will be used extensively to enhance concept development.

Student Learning Outcomes:

- * Solve practical problems using appropriate mathematical techniques.
 - * Demonstrate and apply critical thinking skills to solve a variety of problems.
 - * Utilize a systematic approach to problem solving.
 - * Use appropriate computer technology and software to perform analysis and calculations.
 - * Demonstrate an awareness of the application of mathematics to global and social issues.
 - * Communicate mathematical understanding to others verbally and in written form.
- Prerequisite(s): MATH 0420 or MATH0475 or MATH0485 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

MATH 1351 - Introductory Statistics

This course focuses on the principles and applications of statistics and data analysis with an emphasis on inference. The goals are to help students acquire a solid foundation in the basics of statistics and its application in solving practical problems. This course uses examples from various disciplines to illustrate the relevancy of statistics in real world situations. Topics include descriptive statistics, probability and sampling distributions, estimation and hypothesis testing of parameters, comparison of population parameters, and regression and inference about relationships.

Student Learning Outcomes:

- * Apply mathematical and statistical concepts that form the foundation of statistical analysis and problem solving.
 - * Demonstrate basic skills in collecting, organizing, analyzing and interpreting quantitative data.
 - * Apply an evidence-based approach in problem solving with consideration of probability and contingency.
 - * Utilize procedures for manipulating algebraic expressions and equations.
 - * Demonstrate and apply critical thinking skills to solve a variety of problems.
 - * Interpret the concepts of probability and variability, and their roles in statistics.
 - * Apply probability and statistical principles appropriately to applications.
 - * Utilize a systematic approach to problem solving which incorporates verbal, numeric, visual and symbolic strategies.
 - * Communicate mathematical understanding to others verbally and in written form.
 - * Expand mathematical reasoning skills and formal logic to develop convincing mathematical arguments.
- Prerequisite(s): MATH0475, or MATH0485, or MATH0420 or Appropriate Placement Score.
(4 C: 4 lect/pres, 0 lab, 0 other)

MATH 1380 - Precalculus

Meets MN Transfer Goal 4 - Mathematical/Logical Reasoning. The course is designed for students who have sound algebra skills. The primary goals of this course are to help individuals acquire a solid foundation in the basic skills of college algebra and trigonometry, showing how college algebra and trigonometry can be used to model and solve authentic real-world problems. This course is intended to be a one-semester path to calculus for students who have had at least three years of high school mathematics, including trigonometry. This course consists of material from MATH 1300 and MATH 1320. Course topics include polynomial, rational, exponential, logarithmic, and trigonometric functions and their inverses; systems of equations and inequalities; introduction to linear programming, matrices and determinants; trigonometric identities; equations and applications, parametric equations; polar coordinates; sequences and series; mathematical induction, probability; conics; and modeling. (Cannot be taken for credit if student has received credit for both MATH 1300 and MATH 1320).

Student Learning Outcomes:

- * Apply the basic mathematical concepts that form the foundation of algebra and trigonometry
- * Utilize procedures for manipulating algebraic and trigonometric expressions and equations
- * Demonstrate and apply critical thinking skills to solve a variety of problems
- * Apply algebraic principles appropriately to applications
- * Utilize a systematic approach to problem solving which incorporates verbal, numeric, visual and symbolic strategies
- * Communicate mathematical understanding to others verbally and in written form

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

* Expand mathematical reasoning skills and formal logic to develop convincing mathematical arguments
Prerequisite(s): MATH0475 or MATH0485 or MATH1300 or Appropriate Placement Score.
(5 C: 5 lect/pres, 0 lab, 0 other)

MATH 2310 - Calculus I

Meets MN Transfer Curriculum Goal Area 4 - Mathematical/Logical Reasoning. This course is designed for students who have sound algebra skills. The primary goal of this course is to help individuals acquire a solid foundation in the basic skills of calculus, showing how calculus can be used to model and solve authentic real-world problems. Calculus is the first mathematics course in an engineering or other STEM-related curricular sequence. Course topics include differentiation and integration of polynomial, exponential, logarithmic and trigonometric functions.

Student Learning Outcomes:

- * Apply the basic mathematical concepts that form the foundation of calculus.
- * Utilize procedures for manipulating algebraic and trigonometric expressions and equations.
- * Demonstrate and apply critical thinking skills to solve a variety of problems.
- * Formulate algebraic representations necessary to model problems.
- * Apply calculus and algebraic principles appropriately to applications.
- * Utilize a systematic approach to problem solving which incorporates verbal, numeric, visual and symbolic strategies.
- * Demonstrate mathematical reasoning skills and formal logic to develop convincing mathematical arguments.
- * Evaluate the reasonableness of solutions attained for problems.
- * Communicate mathematical understanding to others verbally and in written form.

Prerequisite(s): MATH1380 or MATH1321.

(4 C: 4 lect/pres, 0 lab, 0 other)

MATH 2320 - Calculus II

Meets MN Transfer Curriculum Goal Area 4 - Mathematical/Logical Reasoning. This course is designed for students who have sound elementary calculus skills. The primary goal of this course is to help individuals acquire a solid foundation in the advanced techniques of calculus, as the skills apply to the differentiation and integration of exponential and logarithmic functions. Additional emphasis is placed upon the analysis of sequences and series. Applications will be incorporated to enhance students' understanding.

Student Learning Outcomes:

- * Apply the basic mathematical concepts that form the foundation of calculus.
- * Utilize procedures for manipulating algebraic and trigonometric expressions and equations.
- * Demonstrate and apply critical thinking skills to solve a variety of problems.
- * Formulate algebraic representations necessary to model problems.
- * Apply calculus and algebraic principles appropriately to applications.
- * Utilize a systematic approach to problem solving which incorporates verbal, numeric, visual and symbolic strategies.
- * Demonstrate mathematical reasoning skills and formal logic to develop convincing mathematical arguments.
- * Evaluate the reasonableness of solutions attained for problems.
- * Communicate mathematical understanding to others verbally and in written form.

Prerequisite(s): MATH2310.

(4 C: 4 lect/pres, 0 lab, 0 other)

MATH 2330 - Calculus III; Multivariable Calculus

Meets MN Transfer Curriculum Goal Area 4. - Mathematical/Logical Reasoning. This course is designed for students who have sound skills in single-variable calculus. The primary goal of this course is to help individuals acquire a solid foundation in multivariable and vector calculus. Students will apply skills to solve authentic real-world problems to enhance students' understanding of higher level concepts.

Student Learning Outcomes:

- * Apply mathematical concepts that form the foundation of multivariable and vector calculus.
- * Utilize procedures for manipulating algebraic and trigonometric expressions and equations.

* Demonstrate and apply critical thinking skills to solve a variety of multidimensional problems.
* Formulate and manipulate algebraic representations necessary to model problems.

* Apply calculus and algebraic principles appropriately to applications.
* Utilize a systematic approach to problem solving which incorporates verbal, numeric, visual and symbolic strategies.

* Demonstrate mathematical reasoning skills and formal logic to develop convincing mathematical arguments.

* Evaluate the reasonableness of solutions attained for problems.

* Communicate mathematical understanding to others verbally and in written form.

Prerequisite(s): MATH2320.

(4 C: 4 lect/pres, 0 lab, 0 other)

MATH 2340 - Differential Equations

Meets MN Transfer Curriculum Goal Area 4 Mathematics/Logical Reasoning. This course is designed for students who have sound skills in single-variable calculus. The primary goal of this course is to help individuals acquire a solid foundation in the basic theory of differential equations. Students will apply skills to solve authentic real-world problems to enhance students' understanding of higher level concepts.

Student Learning Outcomes:

- * Apply mathematical concepts that form the foundation of the theory of differential equations.
- * Apply mathematical concepts to solve first and second linear and nonlinear differential equations.
- * Utilize procedures for manipulating algebraic and calculus based expressions and equations.
- * Demonstrate and apply critical thinking skills to solve a variety of problems.
- * Formulate and manipulate algebraic and calculus based representations necessary to model problems in science and engineering.
- * Apply algebraic and calculus based principles appropriately to applications.
- * Apply the theory of higher-order differential equations appropriately to applications.
- * Apply series solutions to solve differential equations.
- * Utilize a systematic approach to problem solving which incorporates verbal, numeric, visual and symbolic strategies.
- * Demonstrate mathematical reasoning skills and formal logic to develop convincing mathematical arguments.
- * Evaluate the reasonableness of solutions attained for problems.
- * Communicate mathematical understanding to others verbally and in written form.

Prerequisite(s): MATH2320.

(5 C: 5 lect/pres, 0 lab, 0 other)

MHTT 1503 - Diesel Engine Fundamentals

This is an introductory course; students learn theory, design, and operation of a diesel engine and fuel system. Working in the lab, students will disassemble, inspect, and reassemble a running light duty diesel engine. After completion of this course, students will be prepared to advance to Heavy Duty Diesel Engine Repair. All learning outcomes must be performed according to National Automotive Technician's Education Foundation (NATEF) and industry standards.

Student Learning Outcomes:

All listed outcomes must be performed to acceptable levels of NATEF Standards.

- * Demonstrate safe working skills during repair procedures.
- * Describe and practice the use of measuring instruments to compare with industry data.
- * Complete engine repairs and assembly according to manufacturer's specifications.
- * Identify preferred industry repair data and resources to complete engine overhaul procedures.
- * Determine engine component condition for reuse.
- * Perform proper engine component cleaning operations.
- * Identify engine components and operation, including sub systems.

Prerequisite(s): TRAN1502.

(3 C: 1 lect/pres, 2 lab, 0 other)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

MHTT 1507 - Mobile Hydraulics

In addition to power steering, the application of hydraulics on trucks in wide spread, such as on sanitation, snowplow, agriculture, and construction trucks. In this course students study the design and operation of pumps, valves, cylinders, motors, and other hydraulic components of these trucks. The student will service, test, and repair hydraulic systems used on trucks.

Student Learning Outcomes:

- * Explain the basic principles of a hydraulic system
 - * Identify various hydraulic components and their parts
 - * Describe the operation of various hydraulic components in a system
 - * Disassemble and inspect hydraulic components
 - * Perform maintenance on a hydraulic system
 - * Diagnose and test a hydraulic system
 - * Identify the various fittings and hoses used with hydraulics
 - * List and identify common uses for hydraulics in the MHTT industry
- (3 C: 2 lect/pres, 1 lab, 0 other)

MHTT 1508 - Truck Computer Systems

Students will study an overview of the computer systems used on trucks. The emphasis will be on the study of input devices, ECM operation, and output devices. Students will identify components, test their operations, and retrieve and program data in accordance with manufacturers procedures.

Student Learning Outcomes:

- All listed outcomes must be performed to acceptable levels of NATEF Standards.
- * Identify, describe, and test input devices,
 - * Apply varied software used in scan tools and laptops,
 - * Retrieve data and perform basic programming of the ECM,
 - * Identify, describe, and test output devices,
 - * Locate, retrieve and apply service, technical, and troubleshooting information,
 - * Exhibit technician/mechanic professionalism.

Prerequisite(s): TRAN1504.

(2 C: 1 lect/pres, 1 lab, 0 other)

MHTT 1510 - Truck Power Train

The truck power train makes it possible to deliver engine power to the vehicle wheels. This course covers theory and operation of all drive system components including manual transmissions, clutches, drivelines and differentials. Other studies include component troubleshooting, repair operations, and preventive maintenance practices.

Student Learning Outcomes:

- All listed outcomes must be performed to acceptable levels of NATEF Standards.
- * Explain clutch, manual transmission, drive shaft and differential theory of operation.
 - * Utilize manufacturers service data to complete power train rebuild and repair procedures.
 - * Troubleshoot noise, vibration, and poor performance of truck power train components.
 - * Analyze and perform power train preventive maintenance operations.

Prerequisite(s): TRAN1502.

(4 C: 1 lect/pres, 3 lab, 0 other)

MHTT 1514 - Truck Brake Systems

Proper brake system operation is vital to safe utilization of any vehicle used on public roadways. This course covers air and hydraulic brake system theory and operation including actuation and foundation system assemblies. Other studies include component troubleshooting, repair operations, and preventive maintenance practices.

Student Learning Outcomes:

- All listed outcomes must be performed to acceptable levels of NATEF Standards.
- * Describe hydraulic and pneumatic brake system theory of operation.
 - * Utilize manufacturers service data to complete brake system repair procedures.
 - * Troubleshoot noisy and poor brake system performance and determine necessary repairs.
 - * Analyze and perform brake system preventive maintenance operations.

Corequisite(s): MHTT1518

Prerequisite(s): TRAN1502.

(4 C: 1 lect/pres, 3 lab, 0 other)

MHTT 1518 - Truck Steering/Suspension

Understanding and maintaining truck steering and suspension systems is necessary to achieve peak tire life, fuel economy, and safe vehicle operation. Studies include steering and suspension system theory of operation, repair procedures, and preventive maintenance operation.

Student Learning Outcomes:

All listed outcomes must be performed to acceptable levels of NATEF Standards.

- * Identify alignment angles.
- * Perform repair procedures necessary to correct vehicle alignment angles.
- * Apply manufacturers service data to complete wheel bearing and suspension system repairs.
- * Describe steering system theory of operation.
- * Utilize manufacturers service data to complete steering system repairs.
- * Evaluate and perform steering and suspension system preventive maintenance operations.

Prerequisite(s): TRAN1502.

(3 C: 1 lect/pres, 2 lab, 0 other)

MHTT 1522 - Truck Electrical Systems

Through this course, the electrical theory learned in Electricity and Electronic Principles is applied in the lab and lecture setting to increase students' knowledge of vehicle starting, charging, and other electrical systems. Upon the completion of this course, students will be able to maintain, troubleshoot and repair starting, charging, and electrical systems on light, medium, and heavy commercial vehicles.

Student Learning Outcomes:

- * Perform all shop operations in compliance with industry safety standards.
- * Locate and identify battery, starting system, charging system and electrical system components.
- * Diagnose starting system operational tests and perform necessary repairs.
- * Diagnose charging system operational tests and perform necessary repairs.
- * Evaluate electrical system test values to identify system performance and efficiency.
- * Determine electrical system performance and complete necessary electrical system repairs.
- * Troubleshoot and repair electrical system problems utilizing manufacturer's data.

Prerequisite(s): TRAN1504.

(2 C: 1 lect/pres, 1 lab, 0 other)

MHTT 1526 - Truck and Trailer Preventative Maintenance

Students will learn the relationship between a low cost efficient truck operation and preventative maintenance program while ensuring safe vehicle operation. Following the recommendations of the Original Equipment Manufacturer (OEM) maintenance manuals, the student will perform truck and trailer maintenance in the lab. Students will be introduced to electrical, mechanical, lubrication and fluid functions of truck and trailers as they relate to a safe and well-maintained fleet.

Student Learning Outcomes:

All listed outcomes must be performed to acceptable levels of National Automotive Technician's Education Foundation (NATEF) Standards.

- * Explain the importance of preventive maintenance.
- * Examine OEM maintenance schedules.
- * List and practice shop safety procedures.
- * Perform vehicle maintenance and inspection.
- * Explain how electrical, mechanical, lubrication, and fluids relate to proper vehicle function.
- * Perform shop equipment maintenance.
- * Troubleshoot vehicle electrical failures.
- * Troubleshoot mechanical failures.

Prerequisite(s): TRAN1502.

(3 C: 1 lect/pres, 2 lab, 0 other)

MHTT 1530 - Welding

In the trucking industry there is often a need for technicians to have basic welding knowledge and skills. Students are introduced to Shield Metal Arc Welding (SMAW), gas metal arc welding (GMAW), plasma cutting, and oxygen acetylene cutting, heating, welding (OAW). Working in the lab on exercises and projects, students will practice these welding processes safely.

Student Learning Outcomes:

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

- * Perform shield metal arc welding (SMAW)
 - * Perform gas metal arc welding (GMAW)
 - * Perform plasma cutting
 - * Perform oxygen acetylene cutting, heating, welding (OAW)
 - * Fabricate a metal object using welding processes
- (3 C: 1 lect/pres, 2 lab, 0 other)

MHTT 2502 - Heavy Duty Diesel Engine Repair Procedures

With the knowledge and experience gained in Diesel Engine Fundamentals, students will practice engine rebuilding, adjustment, and troubleshooting skills on medium to heavy-duty diesel engines in the lab. Students will follow heavy-duty engine in frame overhaul procedures according to manufacturer guidelines. Students will focus on the operation, maintenance, and repair of various fuel, exhaust, intake, lube and cooling systems.

Student Learning Outcomes:

- * Apply engine system repairs and maintenance according to Original Equipment Manufacturer (OEM) guidelines.
- * Demonstrate safe working skills during repair procedures, follow MN Pollution Control Agency regulations when handling and disposing of engine fluids, cleaning agents, and removed/replaced engine components.
- * Determine fuel, exhaust, intake, lubrication, and cooling system operation.
- * Inspect, clean, and evaluate engine component condition for re-use in accordance to OEM guidelines.
- * Contrast differences and similarities between various engine manufacturers.
- * Analyze engine performance and operation.
- * Perform precise assembly and adjustment procedures.
- * Describe and practice the use of service information software.

Prerequisite(s): MHTT1502, MHTT1503.

(4 C: 1 lect/pres, 3 lab, 0 other)

MHTT 2506 - Diesel III

In this final course of the diesel engine/fuel systems series, student study and work on electronic computer driven engines. Through the knowledge and skills gained in this and previous diesel engine courses, students will be able to program engine computers, diagnose engine failures, and repair engines.

Student Learning Outcomes:

All listed outcomes must be performed to acceptable levels of NATEF Standards.

- * Identify fuel system types
- * Analyze EPA regulations
- * Perform engine tune-ups
- * Evaluate engine computer operation
- * Program engine computer parameters
- * Troubleshoot mechanical engine failures
- * Troubleshoot electronic engine failures
- * Interpret wiring diagrams for engines

Corequisite(s): MHTT2522

Prerequisite(s): MHTT2502, MHTT1508.

(4 C: 2 lect/pres, 2 lab, 0 other)

MHTT 2514 - Gas Engines and Alternative Fuel Systems

In this elective course students have an opportunity to study gasoline engine systems while rebuilding their own gasoline engine in the lab. Emphasis is placed on different fuel and ignition systems.

Student Learning Outcomes:

- * Demonstrate knowledge of properties of automotive fuels
- * Demonstrate knowledge of and test gas fuel supply systems
- * Demonstrate knowledge of and test gas fuel injection systems
- * Demonstrate knowledge of and test ignition systems
- * Rebuild gasoline engine to industry standards

Prerequisite(s): MHTT1502, TRAN1504.

(3 C: 2 lect/pres, 1 lab, 0 other)

MHTT 2518 - Automatic and Automated Manual Transmissions

The popularity of the automatic and automated manual transmission in the medium and heavy-duty truck industry continues to grow. Students will study theory and operation of both automatic and automated manual transmissions in the classroom. Develop hands on skills in the lab by practicing rebuilding of an operational Allison automatic transmission. Lab work will include preventive

maintenance on various automatic transmissions, diagnostics and repairs on a variety of trucks with Allison automatic transmissions as well as numerous automated manual transmissions.

Student Learning Outcomes:

- * Demonstrate safe working skills during repair procedures, follow MN pollution control Agency regulations.
- * Compare and contrast Automatic VS. Automated manual transmissions, including applications and properties.
- * Perform automatic transmission overhaul procedures using manufacturer data and procedures.
- * Determine transmission component condition for reuse.
- * Analyze automatic and automated manual transmission performance to determine necessary service and repair.
- * Perform automatic transmission replacement according to manufacturer service data.
- * Diagnose automatic and automated manual transmission computer control systems and fault codes.

Prerequisite(s): MHTT1510, TRAN1502, MHTT1507.

(3 C: 1 lect/pres, 2 lab, 0 other)

MHTT 2522 - Electrical III

This advanced course involves lighting, instrumentation, accessories, and ABS electrical systems on medium and heavy trucks and trailers. Emphasis is placed on using wiring diagrams and digital multimeters to troubleshoot electrical failures and perform industry approved electrical repair procedures.

Student Learning Outcomes:

All listed outcomes must be performed to acceptable levels of NATEF Standards.

- * Interpret electrical diagrams
- * Apply multimeters to test circuits
- * Test starting and charging circuits
- * Repair electrical failures
- * Discriminate standard color codes
- * Test electrical components

Prerequisite(s): MHTT1522.

(3 C: 1 lect/pres, 2 lab, 0 other)

MHTT 2530 - Truck Heating and AC Systems

Proper operation of Heating and AC ventilation systems is important for driver comfort and safe vehicle operation. This course covers theory and heater AC and ventilation systems. Other studies include system troubleshooting, repair operations, and preventive maintenance practices.

Student Learning Outcomes:

- * Identify heating and AC system theory of operation
- * Utilize manufacturer's service data to complete heating and AC system repair procedures
- * Troubleshoot poor heating and AC system performance and determine necessary repairs
- * Determine heating and AC system preventive maintenance operations

Prerequisite(s): TRAN2514.

(2 C: 1 lect/pres, 1 lab, 0 other)

MHTT 2534 - Transport Refrigeration

Many truck technicians choose careers in which knowledge and skills in transport refrigeration system are needed. The theory and skills are achieved in lecture and through working in the lab on truck and trailer refrigeration units. Emphasis is on maintenance and troubleshooting of electrical and refrigeration systems.

Student Learning Outcomes:

- * Explain refrigeration theory
- * Diagram heat/cool refrigeration flow
- * Service refrigeration system
- * Diagnose refrigeration system
- * Diagram heat/cool current flow
- * Test electrical system
- * Perform preventative maintenance

(3 C: 1 lect/pres, 2 lab, 0 other)

MHTT 2538 - Supervised Internship

Students will work in a sponsoring Medium/Heavy truck service facility. The

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work will be full time, approximately 40 hours per week. The tasks will be consistent with previous course work.

This is a variable credit course, with credits 1-7.

Student Learning Outcomes:

- * Perform required maintenance and various inspection procedures on over the road vehicles, agricultural equipment or heavy equipment
- * Demonstrate job entry skills development when performing service operations
- * Conform to federal OSHA and state MPCA rules as it relates to vehicle service procedures
- * Adhere to ethical practices as it relates to service procedures
- * Exhibit technician/mechanic professionalism

Prerequisite(s): MHTT1526.

(C: 0 lect/pres, 0 lab, 0 other)

MHTT 2546 - Truck Preventive Maintenance and Troubleshooting

Basic skills acquired by the student in previous courses shall be used and developed into advanced troubleshooting and preventive maintenance skills necessary to operate a truck fleet or perform shop operations in the transportation industry. Studies shall include mechanical and electrical system diagnosis and troubleshooting procedures. Identifying and practicing mechanical and electrical system preventive maintenance operations. Customer/shop communication processes shall also be studied.

Student Learning Outcomes:

All listed outcomes must be performed to acceptable levels of NATEF Standards.

- * Identify, diagnose, and repair vehicle electrical and mechanical systems.
- * Analyze drivers report and problem descriptions.
- * Perform power analysis of engine systems.
- * Perform vehicle preventive maintenance inspection.
- * Identify procedures and perform MNDOT annual vehicle inspection.
- * Rebuild truck components.
- * Perform all shop operations in compliance with industry safety standards.

Prerequisite(s): MHTT1526.

(4 C: 1 lect/pres, 3 lab, 0 other)

MKAD 1200 - Introduction to Advertising

Advertising is a broad communications industry employing people in the creative, business, public relations, media research, and marketing areas. Students will study the history of advertising, persuasion and graphic design. There will be exploration into the social and legal impact of advertising on the American economy and culture. The psychology of advertising will also be studied as an important part of the advertising and marketing industry.

Student Learning Outcomes:

- * Study the process of human communication and persuasion.
- * Analyze the history of the advertising process locally, nationally and globally.
- * Identify the social and regulatory aspects of advertising.
- * Describe the overall advertising process in the United States.
- * Prepare advertising messages in conventional and new media.
- * Interpret advertising's economic and societal impact throughout history.
- * Classify different forms of electronic media used today.
- * Differentiate between fair use and the need for permission within the advertising industry.
- * Identify the different careers found within the advertising industry.

(3 C: 3 lect/pres, 0 lab, 0 other)

MKAD 1211 - Adobe InDesign

Adobe InDesign, the industry-standard software will introduce students to the concept and process of graphic design and page layout. Students learn the fundamental principles of page layout working with computers in bitmap, vector graphics, and page layout software. Students learn essential design concepts and techniques used in the design and publishing of documents across a spectrum of digital and print media. Students produce various types of design pieces that reflect industry standards using this page layout software.

Student Learning Outcomes:

- * Recognize design characteristics and determine their strengths and weaknesses to include the proper use of fonts, consistent alignment, and color techniques to enhance print layouts.
- * Apply composition and layout design techniques to create various layout styles.
- * Practice the creative integration of type, text and images into formats unique to print media.

* Differentiate among bitmap and vector graphics, and distinguish between strengths and appropriate uses.

* Proficiently design and layout a variety of computerized print documents.

* Import and create text with full control over textual styling, formatting and copy fitting.

* Create and develop proficient typography and color printing techniques.

* Research, brainstorm and sketch various layout concepts to create final layouts as part of the creative process.

(3 C: 2 lect/pres, 1 lab, 0 other)

MKAD 1216 - Adobe Illustrator

This course will introduce and build proficiency in the use of Adobe Illustrator, the industry-standard illustration program for creating vector-based print, multimedia and web graphics. Students learn design theory and image creation.

They also construct illustrations and prepare them for export to graphics software, to the Web, and for printing. The necessary skills are gained toward developing students understanding and role of Adobe Illustrator's object-oriented tools in the realm of design.

Student Learning Outcomes:

* Create professional level vector-based drawings.

* Proficiently use drawing software and tools to complete Internet or print projects.

* Compose typography with images and vector objects using the software application.

* Differentiate among bitmap, vector, and layout software programs and images.

* Research, brainstorm, and sketch various layout concepts to create final layouts as part of the creative process.

* Apply basic principles of design, color, and perspective to drawn objects using the appropriate software and tools.

* Practice the creative integration of combining type, text, images, and objects into formats unique to print and electronic media.

* Develop project management and organizational skills to meet project needs and deadlines.

(3 C: 2 lect/pres, 1 lab, 0 other)

MKAD 1221 - Adobe Photoshop

Adobe Photoshop is a complex graphics and image editing software as well as a paint program. Adobe Photoshop has become a mainstay with graphics and interactive designers, professional photographers, and even hobbyists to edit graphics as well as create and manipulate images. Students will learn the most commonly used commands and techniques for obtaining consistent, predictable, high quality images using this leading image editing software application. Using the creative tools of the software, students learn how to select pixels in images, use layers, color correct images and to apply layer styles and filters to create special effects. Students will learn how to use vector paths for a variety of purposes, including masking and clipping paths. In addition, students will learn basic scanning techniques and how to create and save images in formats for press, print and Web use.

Student Learning Outcomes:

* Differentiate between color modes and use of raster versus vector graphics.

* Identify and navigate the elements of the Photoshop environment.

* Select appropriate resolutions and image sizes for different bitmap files and output types.

* Examine the use of the software's selection tools to properly edit and extract images pieces and sections.

* Create and manipulate multiple layers to create composite images.

* Apply blending and shading effects to create realistic composites.

* Manipulate image colors using the various palettes and use Photoshop to create artwork or retouch images for print and Web images.

* Create and format text within an image and apply layer styles and filters to create special effects.

* Prepare images, saved to a variety of file formats for use with other applications and the Web.

* Research, brainstorm and sketch various layout concepts to create final layouts as part of the creative process.

(3 C: 2 lect/pres, 1 lab, 0 other)

MKAD 1230 - Writing Copy that Sells

Copywriting is a unique writing skill. It's not like writing business documents or academic papers. Copywriters are storytellers who love words and craft them to

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create messages that sell. Words used by copywriters and how they use them is of vital importance to the overall success of advertising media. This course teaches students to integrate fundamental strategies and to write persuasive advertising copy designed to sell, and build consumer relationships. Students will study copywriting techniques, tactics and creative strategies used to motivate consumers, effectively position products, and build brand awareness.

Student Learning Outcomes:

- * Describe the theory and principles of using copy to communicate with and persuade consumers.
- * Examine the role of the copywriter in the planning, creation, and execution of advertising communication.
- * Identify the goals, purpose and functions of writing advertising copy that sells.
- * Identify product features and benefits of products that draw readers into the advertising copy.
- * Develop writing headlines formulas and creative ideas that get attention, select the audience, and deliver a complete message to the consumer.
- * Apply copywriting skills and techniques to a variety of messages used for specific media.
- * Differentiate between fair use of existing materials and the need for permission. (2 C: 2 lect/pres, 0 lab, 0 other)

MKAD 1265 - Visual Design

This course expands graphic design knowledge and skills, offering students the opportunity to create more advanced design in a variety of applications including print, logos, posters, billboards, brochures and websites. Research, analysis, and the design processes that lead to creative conceptualization and final design solutions are used. Emphasis is placed on visual problem solving skills and the creative and aesthetic aspects of graphic design. Students also study the history and use of typography in design throughout the semester.

Student Learning Outcomes:

- * Apply the elements and principles of design to create solutions to design problems.
- * Employ design techniques to a variety of mediums.
- * Demonstrate proficiency in the use of design software, tools and technology.
- * Identify various styles of well-executed layout formats.
- * Explore the discipline of advertising design.
- * Utilize appropriate typography solutions for a variety of applications and situations.
- * Create and produce advertising design projects such as posters, logos, brochures and print ads.
- * Solve creative problems using research, conceptualizing, design and final comprehensives.
- * Evaluate and discuss individual designs and the designs of others.
- * Present ideas professionally using visual, oral and presentation skills. (3 C: 2 lect/pres, 1 lab, 0 other)

MKAD 1270 - Media Research and Planning

Students will learn and practice basic media research principles as they relate to today's mass media industry. Students will also construct a media plan that meets professional industry standards. Having this media plan in the students' portfolio will show their ability to think critically, solve problems and effectively work with various IMC (integrated marketing communications) scenarios.

Student Learning Outcomes:

- * Study the history of the mass media research and the media planning process.
- * Discuss the role and responsibilities of the mass media researcher.
- * Examine the different types of mass media found within the marketing industry.
- * Evaluate data sources, media research and theories of media strategy.
- * Differentiate how different mass medias are purchased and why.
- * Calculate major mass media formulas.
- * Analyze different target audiences, target markets, target segments, and target cells.
- * Research, design, and create a media plan incorporating industry standards. (3 C: 2 lect/pres, 1 lab, 0 other)

MKAD 2240 - The Northway Group

This course is designed to challenge the serious marketing and design student with a purposeful, specialized occupational experience in the advertising field through participation in The Northway Group (TNG), a student led advertising agency.

Each TNG project is an individualized student experience with a sponsoring business, organization, or professional and their instructor. Each student is assigned agency roles with various projects based upon their skill set and experience. Students will then apply their knowledge of marketing, writing, design, research, photography, computer software and production techniques to complete a series of projects that will realistically simulate agency work experience. As students develop their individual skill sets and experience how TNG operates, they will expand leadership roles and responsibilities in subsequent semesters to hone their craft for their chosen career path.

Student Learning Outcomes:

- * Research potential clients for marketing related needs.
- * Coordinate and implement all agency functions.
- * Develop time management, critical thinking, problem solving and written communication skills.
- * Work with clients to help them identify their current problems and opportunities.
- * Develop skills associated with presentation of agency material to clients for approval.
- * Relay client feedback to team for changes and approval.
- * Effectively contribute in a team setting.
- * Create a professional portfolio of client projects. (2 C: 0 lect/pres, 2 lab, 0 other)

MKAD 2250 - Retail Marketing

Students will learn the fundamentals of national and local retail operations with emphasis on current and future marketing and promotion trends. Store operations, customer service, planning, budgeting, and legal and ethical issues will be discussed. The promotional mix will be identified and illustrated using current retail materials, and trends in the future of retail advertising will be evaluated. Students will study effective media use and produce retail marketing materials for a variety of media such as tabloids, displays and newspaper, and social media advertisements.

Student Learning Outcomes:

- * Research the history of the retailing process locally and globally.
- * Describe the overall retailing process and factors that affect retail marketing decisions.
- * Recognize the impact of retailing on economic and societal environments.
- * Describe the future of retailing including trends, activities, medias and target audiences.
- * Create and produce retail marketing materials such as tabloids and newspaper advertisements.
- * Evaluate legal and ethical issues as they relate to today's retailing environment.
- * Identify mass merchandisers and their marketing strategies.
- * Discuss retail customer relationship management.
- * Identify and incorporate the promotional mix in retail marketing materials.
- * Differentiate between fair use of existing materials and the need for permission. (3 C: 2 lect/pres, 1 lab, 0 other)

MKAD 2260 - Strategic Brand Communications Campaign

Using a unique blend of creative thinking and brand communication strategies, students will develop skills in how to use advertising and other communication tools in a coordinated manner to build and maintain brand awareness, brand contacts and brand preference. This course will provide students with a thorough understanding of the entire advertising campaign process with attention on the strategic thinking of brands, focusing on brand positioning and how of how brands can be best managed to improve customer experiences. Students learn how to deliver creative messages and incentives and learn how to measure their effectiveness. Students create and present an integrated advertising campaign and plans book that includes multiple media executions of a single, unified message, theme or concept.

Student Learning Outcomes:

- * Identify basic advertising campaign and brand terminology.
- * Describe the types and methods used in conducting marketing research.
- * Analyze and develop target consumer segments for a given brand and/or service.
- * Apply the process of developing a campaigns creative strategy.
- * Develop and apply communication objectives, strategies and techniques for different media to include traditional, support, direct response and sales promotion.
- * Generate brand position statements and apply brand position strategies in the

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development of a creative message.

- * Recognize the role of public relations in campaign development and strategy.
- * Examine and develop the campaign media plan and allocate the campaign budget.
- * Produce a comprehensive advertising campaign.
- * Explore various campaign measurement tools and techniques.
- * Outline the relationship between ethics, social responsibility, and advertising.
- * Develop project management and organizational skills to meet project needs and deadlines.

Prerequisite(s): ADVR1200, ADVR1270, ADVR1211, MKAD1200, MKAD1211, MKAD1270.

(4 C: 3 lect/pres, 1 lab, 0 other)

MKAD 2275 - Social Media and Digital Marketing

Social media and digital marketing uses social media and web platforms to promote products and services and track progress, success, and engagement in larger marketing campaign goals. This class will focus on the conceptual foundation and practical approach to developing a successful social media and digital marketing plan. This includes learning how to strategically establish and implement goals that optimize social media platforms to reach organization's specific marketing goals. Specific legal and ethical issues surrounding social media and digital marketing will also be examined.

Student Learning Outcomes:

- * Introduce social media and digital marketing foundations including related theory, terminology, methodology, and models.
- * Identify the components of Internet marketing including; affiliate marketing, email marketing, social media marketing, and search engine marketing and their application in a variety of organizations.
- * Examine the strengths and weaknesses of various social media campaigns, tools, and technologies to gauge success and/or failure.
- * Examine new media trends.
- * Evaluate methods for positioning a product or service using social media and digital marketing and determine if methods meet overall brand/product/service goals.
- * Analyze social media strategies and their applications to appropriately apply them in a variety of settings.
- * Identify the elements of a social media marketing plan and its incorporation into larger integrated marketing communications (IMC).
- * Create a social media and digital marketing plan that incorporates research, goals, implementation, and evaluation metrics.
- * Set social media and digital marketing goals and analyze their effectiveness within the marketing plan.
- and Utilize a variety of social media and digital marketing tools that draw on theoretical frameworks to systematically gauge effectiveness.
- * Examine the legal and ethical environment surrounding use of social media and digital marketing.

(3 C: 3 lect/pres, 0 lab, 0 other)

MKAD 2290 - Portfolio Practicum

In this course students will evaluate the projects to be used in their portfolios and create their own personal, professional portfolios to be used in starting their marketing design careers. Students will study the various portfolio designs found within the industry and then prepare business cards, cover letters, resumes, thank you cards and leave behinds for their job interviews. Use of electronic and physical portfolios and their importance for their interviews will be discussed. Professional industry guest speakers will provide insight into the current job market and industry trends. Advisory level participation in The Northway Group will be an integral part of the class.

Student Learning Outcomes:

- * Demonstrate in-depth knowledge of the marketing industry's job categories and various company organizational structures.
- * Demonstrate how to search and find appropriate entry level jobs in the marketing field.
- * Critically select creative work to successfully meet employers entry level job requirements.
- * Develop interview skills using advertising portfolio, resume, internet, networking and phone communications.
- * Critique guest speakers from industry to provide insights into job market trends.
- * Development of individual USP (Unique Selling Proposition) branding.

- * Create professional electronic and physical portfolio content appropriate for the students' chosen career path.
 - * Successfully present a completed portfolio to industry managers.
 - * Participate in The Northway Group in an advisory role.
- (3 C: 3 lect/pres, 0 lab, 0 other)

MSNA 1205 - Introduction to Help Desk

The course provides students with the fundamentals to provide basic help desk services. Students, through case studies and hands-on projects, will learn to perform activities associated with real-world customer support operations. Focus will be on the development of interpersonal skills and communication with end-users, to troubleshoot and resolve real-world issues, and to identify user hardware and software requirements, and to develop training plans and written documentation for clients. Students will also learn basic installation, configuration and usage of Microsoft Office applications.

Student Learning Outcomes:

- * Learn and demonstrate installation, configuration and use of Microsoft Office Suite.
 - * Investigate hardware and software problems, through effective communication with end-users.
 - * Understand interpersonal issues when working with computer end-users, recognize and demonstrate effective customer service skills.
 - * Identify and document end-user technical requirements, based on user-stated functional needs.
 - * Prepare hardware and software technical specifications for purchasing new systems.
 - * Document problem circumstances and resolution, to assist in resolving future occurrences.
 - * Write end-user documentation, and use application software to create training plans and materials.
 - * Provide end-user training and create reference materials
 - * Instruct customers in the use of hardware and software products.
 - * Understand importance of effective equipment and software distribution
 - * Show mastery of the concept of Frameworks and the guidance they provide by processing lab troubleshooting scenarios through ITIL Frameworks and best practices including troubleshooting, incident resolution, documentation and customer acceptance.
 - * Show competencies in ITIL Service Strategy, Service Design, Service Transition, Service Operation and CSI Processes within the ITIL Framework by developing an IT Services management plan.
- (3 C: 2 lect/pres, 1 lab, 0 other)

MSNA 1213 - Microsoft Server I

Students completing the Microsoft Server I is the first in a series of courses that prepares students to plan, implement and manage a Windows Server environment. By providing the backbone of an enterprise level environment, students will bring sought after systems administration and skills to the workplace. The Microsoft Server I course is designed to provide comprehensive hands-on learning for real world experience. This course covers the objectives outlined by the Microsoft Certified Solutions Associate (MCSA) certification, an internationally recognized industry credential that offers proof of knowledge. The training from this course helps prepare students for careers in network administration, systems administration, systems analyst and technology support.

Student Learning Outcomes:

- * Implement an installation and upgrade of Microsoft Server operating system.
- * Configure server settings to meet performance requirements.
- * Configure server roles.
- * Configure local and remote storage solutions.
- * Explain proper Microsoft licensing of the server based on specific situations.
- * Evaluate routing and remote access authentication and encryption options.
- * Create secure file, print, and group policy objects.
- * Apply a maintenance plan, to maintain server health.
- * Implement server virtualization with Hyper-V.
- * Apply proper networking configuration for successful network communication.

Prerequisite(s): MSNA1214.

(3 C: 2 lect/pres, 1 lab, 0 other)

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MSNA 1214 - Windows Desktop Operating System

Students will study the skills needed to effectively manage the current Microsoft Windows desktop operating system. Topics include installing the operating system and applications; how to use functions and utilities and manage security; and the importance of managing the computer through the command line environment. By completing this course, students are prepared to successfully troubleshoot a Windows desktop system. This course also prepares students for the current Microsoft desktop operating system configuration exam. Completion of this course helps prepare a student for a career in systems administration, network administration, information security and technology support.

Student Learning Outcomes:

- * Perform an installation and upgrade of the Windows desktop operating systems.
 - * Configure devices and device drivers.
 - * Install and configure Windows applications.
 - * Control access to local hardware and applications.
 - * Prepare subnetting information and then configure Windows settings for network connectivity.
 - * Determine security and access settings for shared resources.
 - * Apply proper authorization and authentication configurations to file and folder access.
 - * Configure a Windows computer for remote access and mobility.
 - * Create a plan for preventive maintenance that monitors and maintains Windows clients.
 - * Plan and deploy Windows backup and recovery options.
- (3 C: 2 lect/pres, 1 lab, 0 other)

MSNA 1225 - Routing and Switching Essentials

CCNA RandS: Routing and Switching Essentials (RSE) covers the architecture, components, and operations of routers and switches in a small network. Students learn how to configure a router and a switch for basic functionality. By the end of this course, students will be able to configure, secure and troubleshoot routers and switches and resolve common issues. The course is part of the four-part Cisco curriculum that prepare for the CCNA certification exam.

Student Learning Outcomes:

- * Describe how a router that will forward traffic based on the contents of a routing table.
- * Describe how switching operates in a small to medium-sized business network.
- * Configure and use monitoring tools and network management protocols to troubleshoot data networks.
- * Configure monitoring tools available for small to medium-sized business networks.
- * Configure initial settings on a network device.
- * Configure and secure Ethernet and Serial ports.
- * Design and Implement VLANs, static and dynamic routing, Dynamic Host Control Protocol (DHCP) servers, Network Address Translation (NAT) and access control lists (ACLs).

Prerequisite(s): MSNA1255.

(3 C: 1 lect/pres, 2 lab, 0 other)

MSNA 1230 - Introduction to Networks I

The Introduction to Networks I course introduces the architecture, structure, functions, components, and models of the Internet and computer networks. The principles of network operating systems, network protocol and communications, network access, Ethernet and the Physical, Data Link and Network layers of the OSI model are introduced. Network design emulation tools are introduced as well as industry standard syntax conventions.

Student Learning Outcomes:

- * Describe the devices and services used to support communications in data networks and the Internet.
- * Describe the role of protocol layers in data networks.
- * Build a simple Ethernet network using routers and switches.
- * Describe the operation of protocols at the OSI Data Link Layer and explain how they support communications.
- * Utilize common network utilities to verify small network operations, analyze data traffic, and troubleshoot network problems.
- * Recognize the devices and services that are used to support communications across an Internetwork.

(2 C: 1 lect/pres, 1 lab, 0 other)

MSNA 1235 - Introduction to Virtualization

Introduction to Virtualization focuses in on server virtualization, how it has helped so many enterprises, and what students would need to test and deploy it. We examine both VMware and Microsoft's virtualization offerings available today and administer a virtual enterprise environment. The course allows students to build and manage a virtual environment for hands on training and experimentation.

Student Learning Outcomes:

- * Evaluate the differences in cloud services.
- * Summarize cloud characteristics and terms.
- * Install, configure and manage virtual machines and device.
- * Explain the benefits of virtualization in a cloud environment.
- * Apply appropriate resources using best practices.
- * Diagnose system performance issues.
- * Optimize system performance.

(2 C: 1 lect/pres, 1 lab, 0 other)

MSNA 1240 - Hardware Support

Students learn the functionality of hardware components as well as suggested best practices in maintenance and safety issues. Students will learn to diagnose, troubleshoot, and maintain microcomputer components, computer technology fundamentals, such as PC installation, configuration, mobile devices, and networking as well as safety procedures and prohibited content. Topics include hardware compatibility, system architecture, memory, storage, expansion devices, peripherals, customer service, safety, and preventative maintenance. This course will help students prepare for careers such as Computer Support Specialist, PC Repair Technician, Network Administrator, Network Engineer, Systems Analyst, and Systems Engineer. This course addresses many of the objectives of the CompTIA A+ Essentials (220-901) Certification Exam and prepares students for the first of two exams required for the A+ certification.

Student Learning Outcomes:

- * Explain the importance of computer components, their purpose and properties.
- * Install and configure storage devices and use appropriate media.
- * Identify common PC connector types and associated cables.
- * Compare and contrast network architecture devices, their functions and features.
- * Demonstrate effective communication with end-users.
- * Troubleshoot common problems related to motherboards, RAM, CPU and power with appropriate tools based on a given scenario.
- * Examine a system and determine, based on knowledge and research, the best solution to resolve an issue.
- * Troubleshoot and repair common mobile device issues while adhering to the appropriate procedures.
- * Summarize topical information and explain its importance in the technology field.

(3 C: 1 lect/pres, 2 lab, 0 other)

MSNA 1245 - Software Support

This course will provide practical knowledge of installing and configuring operating systems including Windows, iOS, Android, Apple OS X and Linux, software installation and utility management needed to provide technical support to computer users. It also addresses security, the fundamentals of cloud computing and operational procedures. This course will help students prepare for careers such as Computer Support Specialist, PC Repair Technician, Network Administrator, Network Engineer, Systems Analyst, and Systems Engineer. This course addresses many of the objectives of the CompTIA A+ Essentials (220-902) Certification Exam and completes the preparation for the full A+ certification exam.

Student Learning Outcomes:

- * Compare and contrast various features and requirements of operating systems.
- * Install operating systems using appropriate methods based on a given scenario.
- * Summarize the properties and purpose of services provided by networks host.
- * Perform common preventative maintenance procedures using the appropriate OS tools.
- * Deploy and enforce security best practices on a workstation based on a given scenario.
- * Install and configure basic mobile device network connectivity and email.

Prerequisite(s): MSNA1240.

(2 C: 1 lect/pres, 1 lab, 0 other)

MSNA 1255 - Introduction to Networks II

The Introduction to Networks II course introduces the architecture, structure, functions, components, and models of the Internet and computer networks. The principles of the Transport and Application layers of the OSI model, IP addressing and sub-netting, IPv4 and IPv6 are compared and implemented in small network settings. By the end of the course, students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes.

Student Learning Outcomes:

- * Describe the importance of addressing and naming schemes at various layers of data networks in IPv4 and IPv6 environments.
 - * Design, calculate, and apply subnet masks and addresses to fulfill given requirements in IPv4 and IPv6 networks.
 - * Build a simple Ethernet network using routers and switches.
 - * Use Cisco command-line interface (CLI) commands to perform basic router and switch configurations and analyze the operations and features of common OSI Application Layer protocols such as HTTP, DNS, DHCP, SMTP, Telnet, and FTP.
 - * Describe the operation of protocols at the OSI Data Link Layer and explain how they support communications.
 - * Utilize common network utilities to verify small network operations, analyze data traffic, and troubleshoot network problems.
- Prerequisite(s): MSNA1230. (2 C: 1 lect/pres, 1 lab, 0 other)

MSNA 2201 - Microsoft Server II

Students will study the skills necessary to install and deploy Active Directory in a Microsoft server environment. Topics will include operations such as installing, configuring, and maintaining the Active Directory environment and protecting the environment through management best practices. This course will help validate the skills and knowledge necessary to administer a Windows Server Infrastructure in an enterprise environment. With a focus on real skills for real jobs this course prepares students to prove mastery of core services such as user and group management, network access, and data security. This course covers the objectives outlined by the Microsoft Certified Solutions Associate (MCSA) certification, an internationally recognized industry credential that offers proof of knowledge. The training from this course helps prepare students for careers in network administration, systems administration, systems analyst and technology support.

Student Learning Outcomes:

- * Install and upgrade of Active Directory on Microsoft Server.
- * Evaluate Active Directory in server setting.
- * Configure Active Directory on Server based on a given set of requirements.
- * Apply third party server management software and applications.
- * Design security through the use of authentication and encryption techniques.
- * Implement backups of critical server components and data.
- * Resolve Active Directory issues and user reported problems.
- * Develop and apply group policies based on security and access criteria.
- * Install and configure web security through the use of access lists, group policies, cryptography and the use of certificates.

Prerequisite(s): MSNA1213.

(3 C: 2 lect/pres, 1 lab, 0 other)

MSNA 2211 - Linux Server

The Linux course introduces students to the knowledge and skills needed to manage all Linux distributions. Students will learn installation principles, manage and administer file systems and processes, configure network services and security, and perform other system administrative tasks. This course covers the objectives outlined by CompTIA for its Linux+ certification exam, an internationally recognized industry credential that offers proof of knowledge.

Student Learning Outcomes:

- * Prepare and install Linux using VMWare
 - * Define, use and manage Linux file system
 - * Configure Linux using system management tools
 - * Troubleshoot local and network problems in Linux
 - * Configure and use Linux Bash shell
 - * Navigate the Linux desktop, including KDE, Gnome and Mac GUI
 - * Manage the network and security, including connectivity to Microsoft Server OS
 - * Prepare for Linux+ certification
- (3 C: 2 lect/pres, 1 lab, 0 other)

MSNA 2215 - MSNA Internship

This course emphasizes interaction between the student and internship site with emphasis on applying learned classroom curriculum in an on-the-job environment. The internship program will be available to students who have demonstrated readiness and willingness to learn in an on-the-job situation and have successfully completed their program coursework. Students will learn from hands-on training and real world application in a day-to-day work environment that emphasizes the computer and network installation, configuration, maintenance, administration and repair skills of the program. The internship is considered a last semester class.

Student Learning Outcomes:

- * Adhere to the attendance policy and follow the rules and policies of the internship organization.
 - * Apply knowledge and skills learned at college to meet job requirements.
 - * Demonstrate job skills necessary to accomplish assigned tasks.
 - * Demonstrate dependability and initiative while performing assigned tasks.
 - * Demonstrate ethical behaviors and standards at the work site.
 - * Display honesty and courtesy towards co-workers.
 - * Observe and record job tasks, work standards and policies at the internship site.
 - * Report technology use and trends of the host organization to college faculty.
- (2 C: 0 lect/pres, 0 lab, 2 other)

MSNA 2226 - MSNA Capstone

The Capstone course is taken in the final semester of Network Administration program as a culminating experience where students demonstrate their knowledge, skills and abilities to perform outcomes from their previous coursework. In addition to demonstrating mastery of the technical skills in the program students will also exhibit their ability to manage projects, problem solve, work in teams and communicate to accomplish the outcomes of this course. Scheduled class meetings will be used to perform and validate these skills and be supplemented with discussions on related industry topics and trends.

Student Learning Outcomes:

- * Build, configure, upgrade, and maintain a personal computer system
 - * Diagnose and resolve problems of a personal computer system
 - * Install and configure various peripheral devices, including printers, as well as diagnose and resolve problems related to peripheral devices
 - * Set up, configure, and maintain a local-area network
 - * Resolve network connectivity problems on a local-area network using a systematic troubleshooting approach
 - * Install, configure, upgrade, and maintain Microsoft Windows operating systems
 - * Diagnose and resolve problems using Microsoft Windows system tools
 - * Understand the specialized functions of the network server and the conditions required for a secure network server room
 - * Apply all relevant workplace safety and environment standards during computer maintenance
 - * Use a customer-oriented approach to resolve user problems
 - * Provide computer hardware and software based on a set of standard and systematic diagnostic principles
- (2 C: 0 lect/pres, 1 lab, 1 other)

MSNA 2235 - Cisco Routing and Switching - Scaling Networks

Scaling Networks describes the architecture, components, and operations of routers and switches in a large and complex network. Students learn how to configure routers and switches for advanced functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with OSPF, EIGRP, STP, and VTP in both IPv4 and IPv6 networks. Students will also develop the knowledge and skills needed to implement DHCP and DNS operations in a network.

Student Learning Outcomes:

- * Configure and troubleshoot DHCP and DNS operations for IPv4 and IPv6
- * Describe the operations and benefits of the Spanning Tree Protocol (STP)
- * Configure and troubleshoot STP operations
- * Describe the operations and benefits of link aggregation and Cisco VLAN Trunk Protocol (VTP)
- * Configure and troubleshoot operation of routers in a complex routed network for IPv4 and IPv6
- * Configure and troubleshoot advanced operations of routers and implement RIP, OSPF, and EIGRP routing protocols for IPv4 and IPv6
- * Manage Cisco IOS® Software licensing and configuration files

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- * Explain the functions of hierarchical network design, selecting appropriate devices for a LAN environment
 - * Configure a switch for basic functionality in a converged network
- Prerequisite(s): MSNA1225.
(3 C: 2 lect/pres, 1 lab, 0 other)

MSNA 2240 - Cisco Routing and Switching - Connecting Networks

Connecting Networks discusses the WAN technologies and network services required by converged applications in a complex network. The course enables students to understand the selection criteria of network devices and WAN technologies to meet network requirements. Students learn how to configure and troubleshoot network devices and resolve common issues with data link protocols. Students also develop the knowledge and skills needed to implement IPsec and virtual private network (VPN) operations in a complex network. Students will develop the knowledge and skills necessary to implement a Wireless LAN (WLAN) in a small to medium network. Students will study and apply the knowledge needed to prepare for the Certified Wireless Technology Specialist (CWTS) certification exam. The course is part of the four-part Cisco curriculum that prepare for the CCNA certification exam.

Student Learning Outcomes:

- * Describe the operations and benefits of virtual private networks (VPNs) and tunneling
 - * Describe different WAN technologies and their benefits
 - * Configure and troubleshoot serial connections
 - * Configure and troubleshoot broadband connections
 - * Configure and troubleshoot IPsec tunneling operations
 - * Monitor and troubleshoot network operations using syslog, SNMP, and Net-Flow
 - * Design network architectures for borderless networks, data centers, and collaboration Describe the impact of applications (Voice and Video Over IP) on a network
 - * Configure, verify and troubleshoot DHCP and DNS operations on a router
 - * Explain the appropriate administrative tasks required for Wireless LAN (WLAN) and Install a Small Wireless Network
- Prerequisite(s): MSNA2235.
(3 C: 2 lect/pres, 1 lab, 0 other)

MSNA 2245 - IT Security Fundamentals

This course is designed to expose security concepts to students. Using current events and examples, the students will work through real-world issues facing network administrators. Students will explore the basics of network security, security objectives, security architecture, security models, risk management, network security policy, and security training. The content and materials are designed to help prepare the student for the Security Fundamentals MTA certification which will be offered to students at the end of the course.

Student Learning Outcomes:

- * Identify basic terminology of networking security.
 - * Apply authentication methods commonly used in networked environments.
 - * Simulate common methods used to attack computer networks.
 - * Recognize the basic design of various types of programmed threats used to attack networks.
 - * Formulate a plan to prevent physical security threats to a network.
 - * Implement security configuration parameters on network devices and other technologies.
- (2 C: 1 lect/pres, 1 lab, 0 other)

MSNA 2260 - MS Server Applications

Students will gain hands-on skills to install, configure, and manage Microsoft Server applications, including System Center Configuration Manager (SCCM), Internet Information Server (IIS), Microsoft Exchange and SharePoint using management tools and PowerShell. This course will provide students with a greater knowledge of Microsoft Server applications and the associated management and end-user (client) applications, to better support end users.

Student Learning Outcomes:

- * Demonstrate management of SCCM, Internet Information Services (IIS), Exchange and SharePoint Server Applications, server-side management applications.
- * Troubleshoot Internet Information Server (IIS), Exchange and SharePoint server and client-side application usage and issues.

- * Demonstrate knowledge of basic network command line interface (CLI) utilities, and other software and hardware tool usage to troubleshoot connectivity issues.
 - * Employ network security, to ensure server application information protection.
 - * Automate repetitive administrative tasks through the use of PowerShell and batch scripts.
 - * Deploy Internet Information Services (IIS) for access by the end-user.
 - * Troubleshoot server and client-side application configurations.
 - * Apply security to Internet Information Services (IIS), Exchange and SharePoint.
 - * Identify common security threats and migration techniques.
- (3 C: 2 lect/pres, 1 lab, 0 other)

MUSC 1320 - Music in World Culture

Meets MN Transfer Curriculum Goal Areas 6 and 8 - Humanities and Fine Arts, Global Perspective. This course will examine musical soundscapes, traditional instruments, and cultural perspectives of traditional, folk, and pop genres from major musical traditions in Africa, Asia, the Americas, Europe, and the Middle East. Students will develop basic skills in critical listening, intercultural awareness, analysis, and writing about music. Previous knowledge of musical instrument or notation is not required.

Student Learning Outcomes:

- * Develop a greater international awareness of the world through music
- * Demonstrate knowledge of diverse cultural, social, religious and linguistic differences in musical examples
- * Examine each musical system in its cultural context, including various musical ensembles, instruments, ceremony and ritual attached to the music itself
- * Expand student's cultural perspectives outside of their immediate realm of experience
- * Explain basic musical terminology appropriate to music studies
- * Develop music listening skills to appreciate the similarities and differences between the many diverse cultural music's.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

MUSC 1340 - History of Rock and Roll

Meets MN Transfer Curriculum Goal Area 6 - Humanities and Fine Arts. American popular music has reflected and influenced major social changes from the early 1940s to today. Significant popular music examples reflect the time and space in which they were created and offer a unique study of American social conditions over a musical timeline. This class will examine such musical examples through topics that include Technology, Theatre, Dance, Race, Gender, Identity, and World Music Influences.

Student Learning Outcomes:

- * Research basic historical knowledge of influences in American popular music.
- * Identify basic characteristics of American popular music.
- * Develop listening skills related to basic musical structure.
- * Define basic musical terminology.
- * Examine writings on American popular music.
- * Explore the climates behind American popular music.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

MUSC 1350 - Experiencing Live Music

Meets MN Transfer Curriculum Goal Area 6 - Humanities and Fine Arts. Music is a creative way to promote communication between human beings, who have been making music for as long as humans have been communicating. From Paleolithic flute songs to modern electronic installations, live music expresses the world around us: nature and urban environments, religion, life events: births, weddings, funerals, class divisions, politics, and serves as popular entertainment. This class will explore how live musical events promote communication and express the values and perceptions of human beings. No musical background required.

Student Learning Outcomes:

- * Identify basic characteristics of live music.
- * Develop listening skills related to basic musical structure.
- * Apply basic musical terminology.
- * Explore live music through various methodologies and cultural lenses.
- * Identify relationships between types of live music.
- * Articulate opinions surrounding live music.
- * Develop writing skills to convey musical ideas developed during the course.

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

* Attend live musical performances in class and outside of class.
Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

MUSC 1360 - Class Voice

Meets MN Transfer Curriculum Goal Area 6 - Humanities and Fine Arts. This course is for students with little or no voice training as well as those who wish to continue previous vocal training. Class Voice is designed to offer the opportunity to study the voice as an instrument in an individual and small group setting. Students will examine the history of voice and develop fundamental singing skills through in-class performance of standard vocal literature. These fundamentals will include principles of voice production, breathing, tone placement, resonance, articulation, and song interpretation.

Student Learning Outcomes:

- * Develop basic skills of singing, including vocal technique (in speech and singing) and solo vocal performance.
- * Define basic vocal and musical terminology.
- * Discover strategies for learning a song and performing it effectively.
- * Demonstrate an understanding and thoughtful evaluation of a song's character and mood.
- * Foster a respectful environment for thoughtful and receptive critiques of peers and concert performances.
- * Improve self-awareness and self-confidence through public performance.
- * Develop an appreciation for a variety of vocal styles.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

NUCP 2500 - Nuclear Energy Fundamentals

This course teaches the nuclear power plant fundamentals of basic Atomic and Nuclear Physics, Heat Transfer and Fluid Flow, and Reactor and Power Plant Chemistry.

Student Learning Outcomes:

- * Explain basic atomic structure and nuclear interactions.
- * Demonstrate understanding of the basic fission process and residual/decay heat production.
- * Outline basic reactor types and their operation.
- * Explain concepts of the steam-water cycle, pressure-temperature relationship, and boiling and saturation.
- * Apply fundamentals of chemistry: acids and bases, conductivity, ion exchange, pH, molecules, mixtures, solutions and compounds.
- * Demonstrate understanding of basic water chemistry control fundamentals: impurities, ion exchange theory, parameters monitored, water treatment, corrosion process, water chemistry control methods.
- * Explain reactor water chemistry fundamentals: core conditions, control/removal of impurities, hydrogen gas, radiolysis and recombination, and radiochemistry.

Prerequisite(s): ETEC1541.
(3 C: 3 lect/pres, 0 lab, 0 other)

NUCP 2504 - Nuclear Plant Materials and Protection

This course teaches the properties of reactor plant materials, radiation protection and detection, and reactor plant protection.

Student Learning Outcomes:

- * Analyze basic material properties.
- * Compare brittle fracture characteristics.
- * Distinguish plant material problems (general and specific) and potential impacts.
- * Demonstrate understanding of the principles and operation of radiation protection and monitors.
- * Examine radiation effects on matter and body tissues.
- * Perform calculations that involve radioactive dose and matter.
- * Compare methods of exposure control.
- * Demonstrate understanding of basic concepts of reactor plant protection.
- * Decipher concepts related to accident analysis.
- * Demonstrate understanding of basic concepts related to transient prevention, mitigation of core damage and accident management.
- * Summarize basic information on major industry operating experience.
- * Examine proper methods for breaching systems, including applicable radiological exposure and contamination controls.
- * Determine potential applications and operation of various devices (for example,

video cameras, filter removal tools and remotely operated machines) used for radiological exposure reduction.

Prerequisite(s): NUCP2500.
(4 C: 4 lect/pres, 0 lab, 0 other)

NUCP 2508 - Nuclear Plant Operating Systems

This course covers the main operating systems of nuclear power plants having pressurized and boiling water reactors.

Student Learning Outcomes:

Demonstrate a detailed understanding of the following systems:

- * Auxiliary feedwater and reactor core isolation cooling systems
- * Auxiliary steam systems, including boilers
- * Chemical volume control and reactor water cleanup systems
- * Chilled water systems
- * Circulating water systems
- * Condensate, feedwater and polisher (demineralizer) systems
- * Charging water or control rod drive hydraulics systems
- * Instrument and station air systems
- * Systems that contain important valves
- * Other systems important to plant operations such as those covered by Technical Specifications

Prerequisite(s): NUCP2504. (4 C: 4 lect/pres, 0 lab, 0 other)

NUCP 2512 - Nuclear Plant In Processing

This course is designed to train students on the requirements to get un-escorted access to a Nuclear Plant. Students will go through the in-processing procedure at a Nuclear Plant. Students will be receiving a background check, drug/alcohol test, and successfully complete all Computer Based Training (CBT) for the Nuclear Plant.

Student Learning Outcomes:

- * Understand and demonstrate all rules and regulations needed for a technician in the plant.
 - * Perform proper dress out Dynamic Learning Activity (DLA) for working in contaminated areas.
 - * Recognize and follow plant tagging procedures and perform a Tagging DLA.
 - * Comprehend how to read plant radiation levels and exposure reduction processes.
 - * Interpret dose levels allowed for safe exposure to radiation.
 - * Identify and apply appropriate safety procedures.
- (1 C: 0 lect/pres, 0 lab, 1 other)

NUCP 2516 - Nuclear Plant Electrical Job Shadow

This course is designed for students to follow an electrical technician around to see all procedures and processes an electrical technician does in the nuclear field.

Student Learning Outcomes:

- * Practice all rules and regulations needed for technician in the plant.
- * Sit in on a job briefings and go over any complications or hazards that the technicians should be aware of during the job.
- * Perform plant entry procedures and learn how to log in and out of a work order and the plant.
- * Know how to monitor your dose level while in the plant.
- * Learn what an electrical technician does in the plant.
- * Identify and apply appropriate safety procedures.

Corequisite(s): NUCP2512 (1 C: 0 lect/pres, 0 lab, 1 other)

NUCP 2520 - Nuclear Plant Mechanical Job Shadow

This course is designed for students to follow a mechanical technician around to see all procedures and processes a mechanical technician does in the nuclear field.

Student Learning Outcomes:

- * Practice all rules and regulations needed for technician in the plant.
 - * Sit in on a job briefings and go over any complications or hazards that the technicians should be aware of during the job.
 - * Perform plant entry procedures and learn how to log in and out of a work order and the plant.
 - * Know how to monitor your dose level while in the plant.
 - * Learn what an electrical technician does in the plant.
 - * Identify and apply appropriate safety procedures.
- (1 C: 0 lect/pres, 0 lab, 1 other)

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NURS 2401 - Transitional Nursing Concepts

This course builds on the foundations of the practical nursing curriculum and focuses on the transitional role to the professional level of nursing. Concepts of professional behaviors, ethical and legal issues, communication and technology, and evidenced-based practice are introduced in this course. Students explore the roles and responsibilities within the practice of professional nursing including the nursing process, nursing judgement, and delegation when providing client centered and culturally sensitive care.

Student Learning Outcomes:

- * Explore nursing care that is client centered, culturally sensitive, and based on the holistic needs of clients.
 - * Discuss nursing judgement within the scope of practice for the Registered Nurse.
 - * Examine the role of evidence in determining best nursing practice.
 - * Explain why information and technology skills are essential for safe client care.
 - * Recognize professional nursing behaviors, professional boundaries, codes of ethics, practice acts, and legal/ethical frameworks
 - * Describe delegation and assigning of nursing activities in the healthcare setting.
 - * Relate the roles and responsibilities within the professional nursing scope of practice as it applies to teamwork and other health care team members.
- (3 C: 3 lect/pres, 0 lab, 0 other)

NURS 2411 - Professional Nursing Concepts

This course focuses on the professional nursing standards of practice in preparation for the student to assume the role of the graduate nurse. Nursing theory includes managing care, advocacy, accountability, health care delivery systems, health policy and quality improvement concepts when partnering with clients, families and diverse populations.

Student Learning Outcomes:

- * Examine advocacy, accountability and therapeutic communication when partnering with clients, families, and diverse populations making health care decisions.
- * Analyze evidence based practice components that promote safe, quality care for clients, families and communities.
- * Contrast benefits and limitations of different communication technologies and their impact on safety and quality.
- * Correlate methods of conflict resolution when working with inter-professional teams.
- * Compare leadership skills, delegation and supervision in the healthcare setting.
- * Identify the role of nursing and the inter-professional team in providing quality patient care.
- * Differentiate quality improvement methods to improve patient satisfaction, customer service and enhance cost efficient health care services.

Prerequisite(s): NURS2418, NURS2401, NURS2415.

(3 C: 3 lect/pres, 0 lab, 0 other)

NURS 2415 - Nursing Concepts I

This course assists the student to develop basic knowledge and understanding of focused biophysical, developmental, health, wellness, and illness concepts across the lifespan. The concepts of assessment, caring interventions, clinical decision making, teaching and learning and pharmacological interventions are emphasized as they relate to child and family health and general medical-surgical populations.

Student Learning Outcomes:

- * Apply holistic nursing care that is client and family centered, culturally sensitive, and based on the needs of clients with basic health problems.
- * Demonstrate basic understanding of biophysical, psychosocial, developmental and spiritual needs of the clients and families across the lifespan.
- * Utilize assessment data in the development of a nursing plan of care for clients with basic health problems.
- * Provide rationale for prioritized nursing judgments for patients with basic health problems.
- * Employ evidence based interventions that reduce the risk of harm and/or client complications.
- * Determine common assessment procedures used to examine clients across the lifespan.
- * Examine the nursing process in providing culturally competent care across the lifespan.

(5 C: 5 lect/pres, 0 lab, 0 other)

NURS 2418 - Clinical Concepts I

This clinical course focuses on applying the theoretical concepts of assessment, clinical decision making, caring interventions, teaching and learning, communication, evidence based practice and informatics. Professional behavior concepts are implemented related to accountability, advocacy, ethics and legal issues in nursing practice. Introductory teamwork, collaboration and managing of care concepts are applied in the provision of care for adults, children and child bearing families.

Student Learning Outcomes:

- * Provide holistic nursing care that is client and family centered, culturally sensitive, and based on the needs of clients across the lifespan.
 - * Demonstrate nursing skills using proper techniques and measures that ensure client safety across the lifespan.
 - * Apply nursing judgements when prioritizing care for patients with basic health problems.
 - * Use evidence based interventions that reduce the risk of harm and promote the health of clients with basic health problems.
 - * Demonstrate health record management through electronic medical record systems.
 - * Practice personal integrity, professional boundaries and behaviors related to established codes of ethics, nurse practice acts, and legal and ethical nursing practice standards.
 - * Participate as a member of the inter-professional team collaborating with other health care providers to promote safe, quality, patient-centered care.
 - * Use quality improvement methods to improve patient care.
- (4 C: 0 lect/pres, 4 lab, 0 other)

NURS 2421 - Nursing Concepts II

This course assists the student to develop comprehensive knowledge and understanding of focused biophysical, psychological and social functioning concepts. The concepts of assessment, caring interventions, clinical decision making, teaching and learning and pharmacological interventions are emphasized as they relate to mental health and advanced medical-surgical populations.

Student Learning Outcomes:

- * Analyze nursing care that is client centered, culturally sensitive, and based on the holistic needs of clients and families with complex health problems.
- * Demonstrate comprehensive understanding of biophysical, psychosocial, developmental and spiritual needs of the clients and families across the lifespan.
- * Employ holistic assessment data in the development of a nursing plan of care for patients with complex health problems.
- * Prioritize holistic nursing care for patients with complex health problems.
- * Analyze evidence based interventions which reduce the risk of harm from potential or actual client complications.
- * Differentiate common assessment procedures used to examine clients across the lifespan.
- * Illustrate the nursing process in providing culturally competent care across the lifespan.

Prerequisite(s): NURS2418, NURS2401, NURS2415.

(5 C: 5 lect/pres, 0 lab, 0 other)

NURS 2424 - Clinical Concepts II

This clinical course focuses on synthesizing the theoretical concepts of assessment, clinical decision making, caring interventions, teaching and learning, communication, evidence based practice and informatics. Professional behavior concepts are implemented related to accountability, advocacy, ethical and legal issues in nursing practice. The concepts of teamwork, collaboration and leading and managing of care are applied in the provision of care for multiple patients with complex biophysical and psychosocial care needs in varied health care and rural community settings.

Student Learning Outcomes:

- * Manage nursing care that is client centered and based on the holistic needs of clients, families and diverse populations with complex health needs.
- * Demonstrate advanced nursing skills in developing a holistic care plan for clients with complex health problems across the lifespan.
- * Make nursing judgements when prioritizing care for patients with complex health problems.
- * Use evidence based interventions that reduce the risk of harm and promote the health of clients with complex health problems.
- * Use communication technologies to promote safe clinical decisions.

- * Practice professional nursing in an ethical and legal manner that integrates integrity and accountability.
 - * Demonstrate leadership skills by organizing, delegating and assigning nursing activities to implement the plan of care.
 - * Participate effectively as individuals within the interdisciplinary team with open communication, mutual respect and shared decision making.
 - * Contribute to the management of healthcare and continued quality improvement by incorporating evidence-based practice, cost containment and current technology.
- Prerequisite(s): NURS2418, NURS2401, NURS2415.
(4 C: 0 lect/pres, 4 lab, 0 other)

PHIL 1310 - Introduction to Philosophy

Meets MN Transfer Curriculum Goal Area 6 - Humanities and Fine Arts. Introduction to Philosophy explores the questions that arise from standard philosophical attempts at understanding human nature and experience: Are we minds and bodies? Just bodies? Just minds? What difference might it make? What is it to lead a good human life? What does it mean to live in the modern period? Where do conceptions of identity come from? What is knowledge? What can we know, and how do we know it? What is a thing? Do things have essences? Is reality independent of our minds? Is there a God? While the discipline of philosophy does encompass specialized agendas and many complex technical issues, the sorts of questions we will address in this course are ones to which most of us have, at one time or another, formed some answers, however rudimentary. Students will be introduced to classical and contemporary philosophical treatises that offer answers to these fundamental questions, and will be challenged to develop analytic thinking skills to defend and articulate their own answers. In this course, neither fluency nor even passing acquaintance with the history and practice of philosophy is presupposed; curiosity, on the other hand, is.

Student Learning Outcomes:

- * Describe the scope and variety of philosophical thought as expressed in historical texts, figures, movements and religions.
 - * Explain these philosophical works as investigations into the nature of the world, the basis of human experience, and limits and capacities of human understanding.
 - * Craft an informed, rationally supported personal reaction to these philosophical investigations.
 - * Defend their own philosophical views concerning the nature of the world, human experience and human understanding.
 - * Analyze philosophical views contrary to their own.
 - * Distinguish between the sub-fields of Metaphysics, Epistemology, and Ethics.
 - * Recognize the applicability of traditional philosophical texts to a diverse range of modern problems.
 - * Differentiate between classical philosophical worldviews and worldviews of the modern philosophical period.
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

PHIL 1320 - Ethics

Meets Transfer Goal Areas 6 and 9 - Humanities and Ethical and Civic Responsibility. This course explores the philosophical conceptions of morality and value. It addresses questions such as: how do we make ethical decisions? Where does our sense of right and wrong come from? Do the values we hold apply only to us as individuals, to us as part of a culture, or do they apply to all humans in all places and at all times? Through an examination of major ethical theories, both contemporary and classical, this course reveals the relationship between ethical theory and ethical practice, particularly as it relates to contemporary issues such as the death penalty, poverty, gay marriage, and war.

Student Learning Outcomes:

- * Summarize and differentiate the variety of philosophical thought in ethics
- * Interpret and assess individual investigations into the ultimate basis of human moral values
- * Examine and articulate their own ethical views
- * Describe and apply core theoretical concepts in ethics to specific issues
- * Analyze and reflect on the ethical dimensions of legal, social, and scientific issues
- * Explain the ethical contributions and significance of religious doctrine
- * Develop the ability to intellectually discuss and examine ethical views contrary to their own
- * Understand the difference between logically supported ethical judgment and

popular conceptions of morality

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

PHIL 1340 - Introduction to Logic

Meets MN Transfer Curriculum Goal Areas 2 and 4 - Critical Thinking and Mathematics. Logic is the study of correct reasoning. This course explores the principles of inductive and deductive reasoning, the structure of arguments, and methods for distinguishing between good reasoning and bad reasoning. The course includes traditional Aristotelian logic and modern symbolic logic, validity, invalidity, and proofs. Students will learn a variety of tools for proving validity in deductive arguments and for recognizing formal and informal fallacies in logical reasoning.

Student Learning Outcomes:

- * Identify the components of an argument.
- * Demonstrate what constitutes a valid logical argument employing multiple analytical tools.
- * Apply higher-order problem solving strategies.
- * Translate arguments into standard categorical and syllogistic form.
- * Translate verbal statements into symbolic statements.
- * Differentiate between inductive and deductive arguments.
- * Recognize common logical fallacies in argumentation.
- * Determine immediate inferences.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

PHIL 1360 - Comparative World Religions

Meets MN Transfer Curriculum Goal Areas 6 and 8 - Humanities and Global Perspective. Using a comparative framework, this course attempts to understand the nature of religion by looking at the historical and ideological formation of some of the world's most influential religious traditions. It explores ideas of ultimate meaning in different cultures and different times, and follows the development of these ideas in the long search for purpose in human existence. The primary goal is to comprehend better the varieties of religious experience in the world, with a particular emphasis on understanding the unfamiliar empathetically and the familiar objectively.

Student Learning Outcomes:

- * Explain the history, philosophies, and practices of major religious traditions.
- * Interpret religious values, images, symbols, and texts critically.
- * Recognize the role religion plays in culture.
- * Summarize beliefs and theologies outside their own tradition.
- * Describe how religion has shaped and been shaped by civilizations, past and present.
- * Identify the scope and variety of artistic and literary expressions in religion.
- * Produce an informed personal reaction to artistic and literary works in various religions.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

PHYS 1305 - Conceptual Physics

Meets MN Transfer Curriculum Goal Area 3 - Natural Sciences. This course covers the fundamentals of physics at conceptual level in the area of Mechanics, Properties of Matter, Heat, Sound, Electricity and Magnetism. This is an introductory course in Physics; which underlines on the essential concepts, vocabulary and applications of physics. This course is designed to prepare the students for higher level physics courses or for the students who do not plan to pursue career in science and engineering. This course encompasses lab component which emphasizes on measurement, result prediction, data collection, and data analysis.

Student Learning Outcomes:

- * Apply the concepts of physics in the fields of Mechanics, Properties of Matter, Heat, Sound, Electricity and Magnetism.
- * Expound the linear motion of objects - speed, velocity, acceleration, circular motion, projectile motion and Newton's Law of Motions
- * Illustrate basic fundamentals related to conservation of momentum and energy.
- * Define the angular motion of objects - angular velocity, angular acceleration, torque and angular momentum.
- * Paraphrase the introductory concepts of heat and thermodynamics for example; pressure, temperature, thermal expansion, heat transfer and change of phases and describe first and second law of thermodynamics.

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

- * Interpret basic principles of wave propagation and oscillations.
- * Use various concepts of electricity and magnetism such as Coulomb's law, Ohm's law, series circuit, and parallel circuit.
- * Differentiate between direct and inverse relationship among different physical * Conduct experiments to test hypothesis and mathematical formula.
- * Demonstrate experimental expertise through taking precise measurement, collecting, analyzing, tabulating and interpreting data.
- * Analyze 'real world' problems to simplify them through problem solving techniques and calculate or estimate solutions.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score and MATH 0475 or 0485 or 1300 or Appropriate Placement Score.
(4 C: 3 lect/pres, 1 lab, 0 other)

PHYS 2300 - General Physics

Meets MN Transfer Curriculum Goal Area 3 - Natural Sciences. This course provides students exposure to important concepts and principles of physics as well as their application to everyday phenomena. Students will develop an understanding of mechanics, fluid dynamics, thermodynamics, and sound. Students will gain substantial understanding of experimental procedures including laboratory safety, collaborative learning, data collection, and data analysis through accompanying laboratory segment. This course is intended for students taking liberal arts and/or pre-professional courses.

Student Learning Outcomes:

- * Describe various concepts and principles of physics in the areas of kinematics, statics, dynamics, work, energy, rotational motion, gravitation, thermodynamics, fluid dynamics, waves, and sound.
- * Distinguish between distance and displacement, speed and velocity, mass and weight, static and kinetic friction, elastic collision and inelastic collision, gauge and absolute pressure, and transverse, and longitudinal waves.
- * Explain the motion of objects moving at constant velocity and constant acceleration.
- * Construct comprehensive free-body diagrams (FBD) to solve classic mechanics problems.
- * Determine direction and magnitude of resultant vectors by adding and/or subtracting various vectors.
- * Solve problems using algebra and trigonometry related to the linear motion of objects - speed, velocity, acceleration, circular motion, and projectile motion.
- * Calculate angular velocity, angular acceleration, and centripetal force acting on an object moving on a circular path.
- * Analyze the motion of an object along an inclined plane by using Newton's second law of motion.
- * Apply conservation of energy and conservation of momentum principles to solve problems.
- * Demonstrate understanding of static equilibrium and dynamic equilibrium.
- * Apply Pascal's principle and Archimedes' principle to solve problems of fluid systems.
- * Use the first law and the second law of thermodynamics to solve the problems.
- * Describe the components of wave and relate those components to mechanical vibrations, sound, and decibel levels.
- * Use appropriate computer technology and software to perform experiments, perform analysis, and prepare reports.
- * Show experimental skill by setting-up and performing experiments, collecting data, and formulating conclusion from the performed experiments.
- * Communicate physics theory, experimental results and real world applications of physics principles through effective and clear oral presentation(s) and detailed written document(s).

Prerequisite(s): MATH1300.

(4 C: 3 lect/pres, 1 lab, 0 other)

PHYS 2310 - Engineering Physics I

Meets MN Transfer Curriculum Goal Area 3 - Natural Sciences. This course covers the physics concepts in depth through the use of calculus and vector analysis. It covers the concepts and principles of physics in the area of Mechanics and Thermodynamics. This course is the foundation for the further studies in the field of science, engineering and technology (STEM) and it is designed for the students who plan to pursue career in these fields. The laboratory component associated with this course provides noteworthy experience in various experimental procedures such as laboratory safety, collective learning, designing experiments, data and error analysis.

Student Learning Outcomes:

- * Analyze various theoretical and practical concepts of physics used by engineers, physicist and other scientific professionals in the area of kinematics, statics, dynamics, work, energy, rotational motion, gravitation and thermodynamics.
- * Derive formula from basic principles and work out solution to physical problems in the field of mechanics and thermodynamics.
- * Draw a complete free-body diagram (FBD) for a classic mechanics problems.
- * Perform vector analysis to solve various mechanics problems.
- * Use advanced mathematical techniques to solve the problems related to the linear motion of objects - speed, velocity, acceleration, circular motion, and projectile motion
- * Apply Newton's Law of Motions to solve the problems of statics and dynamics.
- * Apply the law of conservation of energy, linear momentum and angular momentum.
- * Solve problems related to the angular motion of objects - angular velocity, angular acceleration, torque and angular momentum.
- * Compute the amount of heat exchanged for a system where a phase changes may or may not occur.
- * Describe laws of thermodynamics.
- * Calculate the efficiency of Carnot engine and coefficient of performance of a refrigerator.
- * Explain fundamental physical principle which rule the performance of physical structures.
- * Recall basic classical physics laws to solve problems mathematically.
- * Communicate physics theory and experimental results through presentation to peers and faculty.
- * Review laboratory safety procedures and techniques.
- * Verify theoretical physics concepts through practical investigation.
- * Demonstrate cooperative learning skills.
- * Explain that though physics provides estimated answers, it is very appropriate to the real world and is a precious tool for solving problems not at only at global level but also at personal level.

Prerequisite(s): MATH2310.

(5 C: 4 lect/pres, 1 lab, 0 other)

PHYS 2320 - Engineering Physics II

Meet MN Transfer Curriculum Goal Area 3 Natural Sciences. This is the second course in an extensive two semester preparation in calculus physics. The main purpose of this course is to provide a comprehensive overview to the principles of physics using calculus. It covers the concepts and principles of physics in the areas of Electricity, Magnetism, and Optics. This course is a foundation for further studies in the field of science, technology, engineering, and mathematics (STEM) and it is designed for students who plan to pursue careers in these fields. The laboratory component associated with this course provides noteworthy experience in various experimental procedures such as laboratory safety, collective learning, designing experiments, data, and error analysis.

Student Learning Outcomes:

- * Analyze various theoretical and practical concepts of physics used by engineers, physicist, and other scientific professionals in the areas of electricity, magnetism, and optics.
- * Compute electrical force between electric charges using Coulomb's Law.
- * Apply Gauss's law to calculate electric field distribution.
- * Calculate electric potential due to individual charge or distributed charge.
- * Define electric field, electric potential, flux, electric potential energy, capacitance, electric current, current density, and electric power
- * Explain Coulomb's Law, Gauss's Law, Ohm's Law, Ampere's Law, Faraday's Law, and Lenz's Law.
- * Determine the equivalent resistance of numerous resistors connected in series, parallel or combination of both.
- * Summarize characteristics of conductors, insulators, semiconductors, and superconductors.
- * Evaluate simple Alternating Current (AC) and Direct Current (DC) circuits applying Kirchhoff's law.
- * Estimate the capacitance of a parallel plate capacitor, a spherical capacitor, a cylindrical sphere and an isolated sphere capacitor.
- * Find the equivalent capacitance of several capacitors connected in series and/or parallel.
- * Analyze RC Circuit, RL Circuit and a series LRC Circuit.
- * Use Biot-Savart law to estimate the magnetic field of a current carrying long straight wire.

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- * Locate real and virtual images shaped by spherical mirrors and lenses.
- * Describe the total internal reflection phenomenon.
- * Communicate physics theory and experimental results through presentation to peers and faculty.
- * Verify theoretical physics concepts through practical investigation.

Prerequisite(s): MATH2320, PHYS2310.

(5 C: 4 lect/pres, 0.5 lab, 0.5 other)

PLBG 1504 - Piping Procedures I

Students will study plastic piping, which involves the joining of drainage, waste and vent, water supply and distribution lines. Students will become familiar with the different types of copper pipe, fittings and tubing. PEX water and heating distribution piping will be discussed and utilized. Students will also utilize and study water pumps. Safe methods of handling and installing piping in accordance with Minnesota State Plumbing Code and general industry accepted standards will be emphasized.

Student Learning Outcomes:

- * Identify different types and sizes of copper pipe and fittings
- * Operate hand and power copper cutting and cleaning tools
- * Join copper pipe and fittings using appropriate methods and tools of assembly
- * Identify different types and sizes of plastic drainage, waste and vent, water supply pipe and fittings
- * Join plastic pipe and fittings using appropriate methods and tools of assembly
- * Operate plastic cutting hand and power tools
- * Identify and comprehend materials and methods of hanger installation
- * Install DWV piping in project house
- * Install water piping in project house
- * Demonstrate water pump procedures

(5 C: 2 lect/pres, 3 lab, 0 other)

PLBG 1508 - Plumbing Calculations I

This course will apply mathematics to plumbing calculations in developed lengths of pipe, fitting allowances, offsets, areas, volumes, and diameters. Students will also use formulas common to the plumbing industry.

Student Learning Outcomes:

- * Apply mathematical concepts to solve formulas, decimals, fractions, square roots, angle measurement and conversion of length measurements.
- * Identify standard weight pipe and calculate allowances for pipe fittings.
- * Calculate equal spacing and angles.
- * Demonstrate the ability to solve 45-degree diagonals and pipe lengths.
- * Utilize mathematic formulas to solve center to center and end to end pipe calculations.
- * Calculate for slope and drop.
- * Analyze formulas to solve elevations and grade.
- * Calculate rolling offsets.
- * Demonstrate the ability to use constants to solve parallel offsets.

(4 C: 2 lect/pres, 2 lab, 0 other)

PLBG 1510 - Minnesota State Plumbing Code I

Students will study the Minnesota Plumbing Code, which covers the laws, rules, and regulations of plumbing installed in Minnesota.

Student Learning Outcomes:

- * Analyze basic and general plumbing principles.
- * Explain definitions for plumbing terminology related to plumbing code.
- * Identify materials used for fixtures, and fixture fittings.
- * Analyze information relevant for the safe installation and use of water heaters.
- * Identify materials used in water supply and distribution.
- * Demonstrate the ability to select the proper water protection assembly for the application.

(3 C: 3 lect/pres, 0 lab, 0 other)

PLBG 1514 - Minnesota State Plumbing Code II

This course will build on knowledge learned in first semester plumbing code and apply this information to gain through understanding of Minnesota plumbing code. Including pipe sizing of residential homes all the way up to multi story buildings with every type of plumbing fixture in them. This course also covers plumbing license requirements and practical testing to achieve the journeyman license.

Student Learning Outcomes:

- * Sizing water distribution piping system for residential and commercial buildings.
- * Analyze technical charts in the code book to size and correctly install drain waste and vent lines.
- * Design and size indirect waste piping.
- * Design and size storm drainage systems.
- * Sizing and selecting correct traps and interceptors.
- * Design and size storm drainage systems.
- * Utilize referenced standards for plumbing materials and installation procedures.
- * Apply principles of non-potable rainwater catchment systems to select and install systems correctly.
- * Explain the qualifications of licensed plumbers and the steps taken to qualify for a plumbing license.

Prerequisite(s): PLBG1510.

(3 C: 3 lect/pres, 0 lab, 0 other)

PLBG 1518 - Blueprint Reading and Estimating I

The student will learn to read building plans and pipe diagrams, interpret floor plans elevation views, draw isometrics and sketch detailed work drawings. Student will develop skills in estimating plumbing costs for new installations and remodels and prepare projects using industry developed estimating procedures. Estimates include material, fixtures and labor costs with profit and overhead calculations.

Student Learning Outcomes:

- * Read Architects scale.
- * Interpret and draw simple floor plan drawings.
- * Analyze rough in drawings.
- * Draw isometric pipe drawings of residential dwellings.
- * Interpret and draw isometrics of project house plumbing.
- * Design underground and drainage, waste and vent system and estimate labor costs on project.
- * Design and size water distribution piping and estimate the labor cost.
- * Interpret print for fixtures and estimate fixture materials and labor cost.
- * Estimate all labor and materials cost including markup and profit.
- * Demonstrate the ability to write up labor and materials estimate and submit bid for projects.

(4 C: 1 lect/pres, 3 lab, 0 other)

PLBG 1520 - Blueprint Reading and Estimating II

The student will learn how to read building plans and pipe diagrams. Interpret floor plans, elevation views, draw isometrics and sketch detailed work drawings. Student will develop skills in estimating plumbing cost for basic residential installations and remodels. Building on these skills, the student will gain knowledge of complex residential and commercial blueprint reading, pipe diagrams, isometric drawing and job cost estimating. Student will learn to interpret commercial building systems including how to size, draw and estimate the cost of a storm water disposal system and commercial bathroom groups.

Student Learning Outcomes:

- * Draw floor plans to scale.
- * Interpret complex residential prints.
- * Design isometric pipe diagrams.
- * Analyze the code book to Size isometric drawings.
- * Estimate costs from isometric drawings form residential projects.
- * Demonstrate how to size and draw storm water systems.
- * Demonstrate the ability to size and draw commercial plumbing projects.
- * Estimate isometric drawings for commercial project.

Prerequisite(s): PLBG1518.

(3 C: 1 lect/pres, 2 lab, 0 other)

PLBG 1524 - Plumbing Calculations II

This course will build on the knowledge of plumbing calculations one and move into more advanced plumbing math that is used in the plumbing trade. The course uses formulas to solve for many complex problems that arise in plumbing systems. The math is then applied to lab projects in practical situations.

Student Learning Outcomes:

- * Apply mathematic conversions to solve for elevation and grade.
- * Utilize formulas to calculate rolling offsets.
- * Utilize graphing to solve pipe length by layout.

- * Demonstrate the ability to solve for water measure including volumes pressure and capacity.
- * Analyze formulas for water pressure head and force.
- * Evaluate properties of gases and how that relates to safer use of gases.
- * Evaluate building conditions that effect heat loss calculations.

Prerequisite(s): PLBG1508.

(3 C: 1 lect/pres, 2 lab, 0 other)

PLBG 1530 - Piping Procedures II

Students will learn about commercial plumbing systems which will include working with cast iron and, steel pipe. The student will also learn about flushometer water closets and urinals and how to install them in public bathrooms meeting ADA requirements. Students will get to use a scissor lift work platform to install pipe on high ceiling areas. Students will learn the standard installation procedures of common plumbing fixtures and appliances, which comply with the Minnesota Plumbing Code requirements. Students will also learn troubleshooting procedures for plumbing service and repair.

Student Learning Outcomes:

- * Identify different kinds of steel and cast iron pipe and fittings.
- * Operate hand powered steel and cast iron pipe cutting tools.
- * Operate steel and cast iron assembly tools.
- * Utilize various types of hangers.
- * Fabricate and assemble steel and cast iron projects using technical prints.
- * Rough in water supply and drainage waste and vents.
- * Install water closets, kitchen sinks, lavatories, showers, and bathtubs in school labs and in current house projects.
- * Analyze technical data to repair faucets, water closets and water heaters.
- * Design a hydronic heating system with proper components.

Prerequisite(s): PLBG1504.

(3 C: 1 lect/pres, 2 lab, 0 other)

PLBG 1538 - Plumbing Internship

Students will work in a sponsoring plumbing-related business applying knowledge, concepts and skills learned in the classroom and lab.

Student Learning Outcomes:

- * Apply skills learned in the classroom towards real plumbing jobs.
- * Work with a variety of employers and employees.
- * Work with customers to solve problems with plumbing systems.
- * Repair and install plumbing systems.

(2 C: 0 lect/pres, 0 lab, 2 other)

PLBG 1544 - Career Planning/Customer Relations

This course will prepare students for their careers in the pipe trades and help them secure their first job. The student will set goals and connect those to the job seeking process. Student will participate in discussions with prospective employers. Soft skills will be developed as part of building good customer relations.

Student Learning Outcomes:

- * Generate professional written materials to attain future careers in the pipe trades.
- * Accurately complete initial plumbing license application.
- * Identify and apply ethical and good customer relations skills in in classroom and lab situations.
- * Analyze various compensation and benefit packages between plumbing shops.
- * Demonstrate good interview skills.

(1 C: 0 lect/pres, 1 lab, 0 other)

PLTW 1500 - Introduction to Engineering Design

This course covers fundamental principles of the engineering design and development process. Topics include planning and developing, recording, modeling, product analysis and marketing. The student will learn procedures in these areas, developing their own ideas in a lab environment, and presenting their ideas. Specific emphasis is given in drawing and developing through the use of pencil sketching and computer software.

Student Learning Outcomes:

- * Apply pencil sketching techniques
- * Create multiple-view drawings using software
- * Develop a portfolio documenting the entire design process
- * Apply process planning, procurement, cost analysis and quality control principles

principles

- * Demonstrate the ability to work as a member of team to achieve a common goal, by showing respect for other people's needs, ideas, and feelings
- * Use appropriate computer technology and software to perform experiments, perform analysis, and prepare reports
- * Model professional and responsible behavior by being on time, participating in class discussions and completing assignments on time
- * Demonstrate effective use of resources including faculty, other students, reference materials, industry sources, and the Internet
- * Demonstrate safe work habits

(3 C: 1 lect/pres, 2 lab, 0 other)

PLTW 1502 - Principle of Engineering

This course covers fundamental principles and processes of engineering. Topics include definition and types of engineering, the design process, engineering systems, engineering for reliability, and the documentation process used in engineering fields. The student will learn procedures in these areas, developing their own ideas in a lab environment, and presenting their ideas. Specific labs in material testing, statics, and statistics will be utilized. The student will acquire a fundamental approach in the design, development and engineering process. Individuals will apply these skills through problem solving and laboratory experiments.

Student Learning Outcomes:

- * Identify different types of engineering fields
- * Create rough sketches of designs
- * Create simple drawings using CAD software
- * Identify different engineering systems
- * Perform basic calculations for statics and strength of materials
- * Understand basics of dynamics and kinematics
- * Demonstrate the ability to work as a member of a team to achieve a common goal, by showing respect for other people's needs, ideas and feelings
- * Use appropriate computer technology and software to perform experiments, perform analysis, and prepare reports
- * Model professional and responsible behavior by being on time, participating in class discussions and completing assignments on time
- * Demonstrate effective use of resources including faculty, other students, reference materials, industry sources, and the Internet
- * Demonstrate safe work habits

(3 C: 1 lect/pres, 2 lab, 0 other)

PLTW 1504 - Digital Electronics Engineering

This course covers fundamental principles of digital electronics, number systems and Boolean Algebra. Topics include number conversion, logic simplification, logic gates and their applications, sequential logic, logic families, microprocessors and interfacing. A background in basic electronics is given to aid in the understanding of some of the material presented in this course. The student will learn how to connect logic gates to form functional devices using simulation and breadboards with integrated circuits. Finally, a capstone project of their own design will be simulated, built on a breadboard and presented.

Student Learning Outcomes:

- * Identify logic gates and families
- * Simplify combinational logic circuits
- * Design, build, analyze, debug, trouble-shoot, test, and repair digital circuits and systems
- * Interface digital circuitry with the real world
- * Demonstrate the ability to work as a member of a team to achieve a common goal, by showing respect for other people's needs, ideas, and feelings
- * Use appropriate computer technology and software to perform experiments, perform analysis, and prepare reports
- * Model professional and responsible behavior by being on time, participating in class discussions and completing assignments on time
- * Demonstrate effective use of resources including faculty, other students, reference materials, industry sources, and the Internet
- * Demonstrate safe work habits

(3 C: 1 lect/pres, 2 lab, 0 other)

PLTW 1506 - Civil Engineering and Architecture

Students learn about various aspects of civil engineering and architecture and apply their knowledge to the design and development of residential and commercial properties and structures. In addition, students use 3D design software to

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design and document solutions for major course projects. Students communicate and present solutions to their peers and members of a professional community of engineers and architects

Student Learning Outcomes:

- * Create working drawings using CAD software
- * Create presentation drawings using CAD software
- * Calculate costs and quantities for a construction project
- * Identify typical components of a residential framing system
- * Determine the loads transferred from a steel framed structure to the ground through the foundation

(3 C: 1 lect/pres, 2 lab, 0 other)

POLS 1304 - Introduction to American Politics

Meets MN Transfer Goals 5 and 9 - History/Social, Behavioral Sciences and Ethical/Civic Responsibility. Introduction to American Politics is an introductory course on political ideologies, (democracy, capitalism, etc.), political institutions, (federal, state, and local governmental systems), and processes, (how a bill becomes a law, etc.). Team learning, community involvement and off-campus activities such as city council meetings are used as teaching tools.

Student Learning Outcomes:

- * Understand the major political institutions in the United States, the state and locally
- * Understand how the political system works and more importantly, what part they can play in the system
- * Understand how the scientific method applies to political behavior, with the limitations and potential it has to help understand politics
- * Apply critical thinking skills to the political process and to political behavior

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.

(3 C: 3 lect/pres, 0 lab, 0 other)

POLS 1320 - Public Issues

Meets MN Transfer Goals 5 and 9 - History and the Social and Behavioral Sciences and Ethical and Civic Responsibility. This course examines issues of domestic public policy such as poverty, social services, the environment, criminal justice enforcement, economic problems, social inequality, and civil liberties. There will also be consideration of foreign policy issues such as national security, military interventions abroad, nuclear weapons, international economic competition, and human rights.

Student Learning Outcomes:

- * Acquire basic knowledge and understanding of several important social problems and public policies
- * Gain additional knowledge about current affairs, political controversies, and international relations
- * Acquire additional knowledge of the U.S. government and the Constitution
- * Develop greater curiosity about the problems and event of the modern world
- * Develop enhanced college-level skills in analysis, writing, research and oral presentations

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.

(3 C: 3 lect/pres, 0 lab, 0 other)

PRSG 2401 - Medical Surgical Nursing I

This course will cover conditions and diagnostics related to body systems, medical terminology, pathophysiology, signs and symptoms, medical/surgical treatment and nursing interventions of acute and chronic disorders. The course includes components of disease prevention and health promotion for diverse populations and emphasis on the effects of aging. Care based on evidence based practice and established institutional and safety guidelines will be introduced throughout the content.

Student Learning Outcomes:

- * Summarize patterns of health promotion and disease prevention for acute and chronic conditions incorporating transcultural approaches to health.
- * Relate science and evidenced based practice to safe patient care.
- * Identify nursing interventions based on professional knowledge and scope of practice to minimize risk of harm and enhance the likelihood of desired health outcomes.
- * Summarize individual patient responses to health and illness emphasizing humility, trust, empathy, and support.

* Determine the definition, diagnostics, pathophysiology/etiology, signs and symptoms, medical/surgical treatments, and nursing interventions of acute and chronic disorders.

(3 C: 3 lect/pres, 0 lab, 0 other)

PRSG 2402 - Medical Surgical Nursing II

This course is a continuation of content from Medical Surgical Nursing I and integrates the nursing concepts introduced in other program courses. This course will cover conditions and diagnostics related to body systems, medical terminology, pathophysiology, signs and symptoms, medical/surgical treatment and nursing interventions of acute and chronic disorders. The course includes components of disease prevention and health promotion for diverse populations and emphasis on the effects of aging. Prioritization of care based on evidence based practice and established institutional safety guidelines will be covered throughout the content.

Student Learning Outcomes:

- * Differentiate patterns of health promotion and disease prevention for acute and chronic conditions incorporating transcultural approaches to health
- * Incorporate science and evidenced based practice to safe patient care
- * Prioritize nursing interventions based on professional knowledge and scope of practice to minimize risk of harm and enhance the likelihood of desired health outcomes
- * Interpret individual patient responses to health and illness emphasizing humility, trust, empathy, and support
- * Determine the definition, diagnostics, pathophysiology/etiology, signs and symptoms, medical/surgical treatments, and nursing interventions of more complex acute and chronic disorders.

Prerequisite(s): PRSG2409, PRSG2419, PRSG2401, PRSG2439, PRSG2429.

(3 C: 3 lect/pres, 0 lab, 0 other)

PRSG 2409 - Basic Nursing Concepts

In this course, the student will acquire the theory base essential to building a foundation for the practice of nursing which encompasses safe, quality nursing care. This course utilizes the nursing process as the stepping stone to assist the student to begin to recognize principles of alterations in health. This course will also introduce ethical and legal principles and expected personal and professional behaviors that are needed to provide safe holistic care.

Student Learning Outcomes:

- * Recognize basic concepts and principles of nursing practice in the health care environment.
- * Relate knowledge and science to nursing practice.
- * Discuss personal and professional standards and behaviors of nursing practice.
- * Develop therapeutic relationship skills for nursing practice.
- * Describe the impact of team functioning on safe quality care.

(3 C: 3 lect/pres, 0 lab, 0 other)

PRSG 2411 - Bridging to Nursing Practice

In this course the student will synthesize and integrate prior learning from practical nursing theory and lab classes. The student will focus on topics and skills that relate to the graduate nurse role. The student will acquire needed knowledge in ethical, legal, state licensure, and nursing practice standards while exploring the transitional process from student to entry level practical nurse.

Student Learning Outcomes:

- * Examine how change, technology, legislation, economics, and regulation affect nursing practice.
- * Evaluate legal and ethical behaviors on regulatory and professional standards.
- * Compare and contrast leadership and management within the scope of the practical nurse.
- * Analyze factors, including evidenced based practice, that contribute to patient safety and methods of improving safety in health care environments.
- * Determine sources of conflict and conflict resolution strategies.
- * Design and complete a service learning project.

(2 C: 2 lect/pres, 0 lab, 0 other)

PRSG 2419 - Nursing Skills

This course allows the practical nursing student to develop essential technical and communication skills that are necessary to provide safe, quality nursing care. While using a holistic approach, students will build the necessary skills that are based upon focused nursing assessment data and nursing judgment to provide

care to patients with alterations in health. Students will build these skills through demonstration, implementation and evaluation in a simulated health care setting. Students will adhere to the personal and professional standards of nursing practice.

Student Learning Outcomes:

- * Demonstrate basic concepts and principles of nursing practice.
 - * Modify nursing action based on judgment, knowledge, and science in nursing practice.
 - * Display personal and professional standards of nursing practice.
 - * Practice safe and quality patient care.
 - * Demonstrate therapeutic interactions in nursing practice.
 - * Employ effective teamwork by respecting others contributions when providing safe and quality care.
- (3 C: 1 lect/pres, 2 lab, 0 other)

PRSG 2429 - Essentials of Clinical Pharmacology

In this course students will acquire introductory pharmacology information that includes referencing and resources for safe medication administration in nursing. This course covers classifications, dosing, expected action, routes, side effects, drug interactions, and nursing implications for current and newly developed medications. This course will also explore new technologies applicable to pharmacology. Content also includes how individual values and beliefs impact health.

Student Learning Outcomes:

- * Identify medications and their effects on each body system.
 - * Review current technologies and guidelines that promote safe medication administration.
 - * Summarize nursing responsibilities before, during, and after a medication is administered.
 - * Analyze how individuals' values and beliefs impact health.
- (2 C: 2 lect/pres, 0 lab, 0 other)

PRSG 2439 - Clinical Application I

In this course the student will implement the nursing process and nursing skills in a variety of healthcare settings. Students will also deliver care while developing prioritization and critical thinking skills. Delivery of care will focus on the nursing process, theory, and professional standards. Students will be guided in performing nursing functions and in the implementation of empathetic nursing care of the whole person.

Student Learning Outcomes:

- * Demonstrate the roles and professional responsibilities including legal and ethical behaviors of the practical nurse.
 - * Identify differences in health care beliefs and values in diverse populations.
 - * Summarize the need to be cost effective while delivering patient care.
 - * Demonstrate the ability to utilize evidence based practice, nursing process, decision making, and critical thinking skills.
 - * Demonstrate caring, compassion, empathy, trust, support, and show respect, dignity, and humility for all individuals while delivering nursing care.
 - * Demonstrate therapeutic and effective communication with clients and members of the multidisciplinary team to enhance quality and safety of client care.
 - * Recognize the importance of self-reflection, life-long learning, and how these impact safe nursing care.
 - * Participate as a positive member in a multidisciplinary health care team.
- (3 C: 0 lect/pres, 3 lab, 0 other)

PRSG 2440 - Clinical Application II

This course is a progressive course as it builds on Clinical Application I. In this course students will be expected to deliver care while utilizing prioritization and critical thinking skills. The expectation is that the student will have a more thorough understanding of the nursing process, theory and professional standards. Students will be expected to perform independent nursing functions and be able to implement empathetic nursing care of the whole person. The students will have opportunities to implement the nursing process and nursing skills in higher acuity health care settings.

Student Learning Outcomes:

- * Compare and contrast the differences in health care beliefs and values while applying legal and ethical behavior with diverse populations.
- * Demonstrate health promotion and disease prevention strategies.
- * Prioritize and organize care while being cost effective.
- * Collect and interpret client data using evidence based practice, nursing process,

decision making, and critical thinking skills.

- * Demonstrate regulatory and professional standards with awareness of personal beliefs, values, and biases to support compassionate care.
 - * Demonstrate therapeutic and effective communication with clients and members of the multidisciplinary team to enhance quality and safety of client care.
 - * Utilize effective interventions and technologies to promote personal and client safety.
 - * Demonstrate empathetic, compassionate, non-judgmental nursing care which upholds the value of the whole person.
 - * Illustrate self-reflection and recognize the importance of life-long learning.
 - * Participates as a positive member in a multidisciplinary health care team.
- Prerequisite(s): PRSG2401, PRSG2439, PRSG2409, PRSG2419, PRSG2429.
(5 C: 0 lect/pres, 5 lab, 0 other)

PRSG 2450 - Maternal Child Nursing

This course covers nursing concepts for the obstetric and pediatric patients. This course provides an opportunity to explore the physiological and psychological responses to illness while considering diversity. Nursing care concepts and the application of the nursing process are considered with the focus on health promotion and disease prevention.

Student Learning Outcomes:

- * Apply health promotion and disease prevention principles.
 - * Integrate evidence based practice to provide safe patient-centered care.
 - * Describe the definition, diagnostics, pathophysiology/etiology, signs and symptoms, medical/surgical treatments, and nursing interventions for obstetric and pediatric conditions.
 - * Prioritize nursing interventions based on professional knowledge and scope of practice to minimize risk of harm and enhance the likelihood of desired health outcomes.
 - * Evaluate how diversity impacts wellness and health care practices.
- Prerequisite(s): PRSG2409, PRSG2419, PRSG2401, PRSG2439, PRSG2429.
(3 C: 3 lect/pres, 0 lab, 0 other)

PRSG 2460 - Mental Health Nursing

In this course the student will have the opportunity to develop their understanding of human behavior, mental health disorders, psychiatric medications and therapeutic communication skills. The student will also examine nursing interventions, the cognitive affect, and behavioral functioning of clients within a legal and ethical framework.

Student Learning Outcomes:

- * Investigate the role of therapeutic communication and defense mechanisms in the nursing care of the client with mental health disorders.
 - * Describe HIPAA and its role in mental health care delivery.
 - * Apply the concepts of personality development and developmental tasks related to mental health nursing.
 - * Identify classifications, uses, actions, side effects, nursing considerations and interventions for selected psychiatric medications.
 - * Differentiate physical and behavioral symptoms, treatment modalities and nursing care of mental health disorders.
 - * Apply the concepts of crisis to mental health nursing and the nurse's role in crisis situations.
 - * Examine the characteristics and treatment of substance abuse.
- (2 C: 2 lect/pres, 0 lab, 0 other)

PSYC 1300 - Introduction to Psychology

Meets MN Transfer Curriculum Goal Area 5 - History/Social, Behavioral Sciences. Survey of contemporary scientific psychology. Includes: research methods, biological bases of behavior, cognitive mechanisms, sensation and perception, learning and behavioral adaptation, development, social influences, and personality disorders.

Student Learning Outcomes:

- * Explain the scientific method, data collection, and analysis used in psychological research.
- * Apply psychological theories, processes, and concepts to human behavior.
- * Explain strategies for self-discovery and insight.
- * Compare and contrast normal and abnormal behaviors.
- * Analyze cultural and historical perspectives in the science and practice of psychology.

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* Demonstrate critical thinking skills applied to psychological phenomena.
Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

PSYC 1304 - Life Span Developmental Psychology

Meets MN Transfer Goal 5 - History and the Social and Behavioral Sciences. Life Span Psychology is both intriguing and biographic because each of us is constantly developing. The course examines human biosocial, cognitive, and psychosocial development in diverse contexts from "Womb to Tomb". It includes coverage of scientific discoveries and theories; critical analysis of evidence supporting or contradicting those theories; basic concepts and terminology; integration of personal experience and developmental theory and research; and related current public policy and diversity issues.

Student Learning Outcomes:

- * Explain the scientific methodologies used in developmental psychology.
- * Compare and contrast the major developmental theories.
- * Demonstrate a basic understanding of the interaction of the developmental process and periods of human development.
- * Integrate developmental theory and research with naturalistic and/or other observations of individuals at various stages of development.
- * Compare and Contrast ones own personal development and projected future development across the developmental life stages.
- * Evaluate and analyze current public policy issues in the field of developmental psychology

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

PSYC 1310 - Psychology of Women

Meets MN Transfer Goal 5 and 7 - History/Social, Behavioral Sciences and Human Diversity. Psychology of Women will critically explore the topic of women's psychology in a sociocultural, historical, global and multi-cultural context. It will focus on many facets of women's lives and the sociocultural impact. This course will compare feminist theories and research with other theories that are sex biased.

Student Learning Outcomes:

- * Compare and contrast feminist and traditional theories and research and critically examine biases relevant to the psychological factors shaping the lives of women.
- * Identify the psychological effects of dominance, and subordination in women's relationships.
- * Analyze the beliefs and theories regarding women's sexuality and its impact.
- * Identify contributions of historical and contemporary women psychologists.
- * Analyze implications of gender roles and gender stereotypes in a personal and cultural context and its solutions.
- * Summarize the unique experiences of women of color and lesbian and bisexual women.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

PSYC 1320 - Psychology of Trauma

Meets MN Transfer Curriculum Goal Area 5 - History/Social, Behavioral Sciences. This course provides an overview of the psychology of trauma. Topics include a review of acute stress and trauma, a historical perspective, and the impact on individuals, families, and communities. The course also includes education on related psychological disorders and treatment, current trends and research, as well as what communities are doing for prevention. This course is of particular interest for people who are pursuing a field where they'll be working with traumatized individuals or who want to understand more about the topic.

Student Learning Outcomes:

- * Demonstrate an understanding about research and the scientific methods used in the study of psychology.
- * Evaluate current research in the field of acute stress and trauma.
- * Describe cultural and historical perspectives regarding traumatic events and individual, family, and community responses to trauma.
- * Explain the historical and cultural changes to trauma treatment.
- * Describe current psychological disorders and critique treatment perspectives related to trauma.
- * Analyze the different theoretical approaches in psychology used to understand trauma, and the effects traumatic events have on people.

* Evaluate society's response to trauma and traumatic events.
* Discuss and develop solutions for community awareness and prevention strategies.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

PSYC 1350 - Positive Psychology - Building Human Strengths

Meets MN Goal Area 5 - History and the Social and Behavioral Sciences. Positive Psychology uses the scientific method to measure, understand and build the characteristics and virtues that foster a satisfying and meaningful life. The course will include numerous self-assessment exercises to bring awareness and to develop the characteristics such as love, empathy, self-control, wisdom, commitment, happiness, self-respect, hope and friendship. Students will examine research and theory from behavioral, cognitive, developmental, personality and social psychology as well as human physiology and neuroscience. The course will include stress management.

Student Learning Outcomes:

- * Demonstrate an understanding about how research is conducted and the goals of researchers in the field of positive psychology and how it differs from other fields of study in psychology
- * Describe and critically analyze scientific evidence regarding what creates well being
- * Evaluate and integrate personal strengths and weaknesses through scientific research based assessments
- * Identify unhealthy triggers to stress such as alcohol, tobacco, and drugs and critically analyze research and theory on the causes, effects and healthy solutions
- * Identify safe and healthy sexual relations
- * Apply the Positive Psychology scientific theories of mind-body approaches to their own health
- * Analyze alternative theories and treatments such as physical exercise for anxiety, stress, and depression
- * Compare and contrast cultural values regarding human strengths

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

PSYC 2310 - Abnormal Psychology

Meets MN Transfer Goal Area 5 - History/Social, Behavioral Sciences. This course explores the nature and causes of abnormal behavior and the terminology used in describing and discussing abnormal behavior. Students will examine current trends and research in the fields of mental health and psychopathology.

Student Learning Outcomes:

- * Examine abnormal behavior in a historical and cultural context
- * Describe the current system for the classification and assessment of mental disorders
- * Categorize the behaviors and syndromes necessary for the diagnosis of mental disorders
- * Identify the gender, cultural, psychological, biochemical, and environmental factors which predispose individuals toward mental disorders
- * Compare the different approaches used in treating mental disorders including psychotherapy, medical, and non-psychiatric methods such as 12 step programs
- * Utilize research and statistics to answer questions about mental disorders and its impact on society
- * Examine how legal issues influence the treatment of mental disorders

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

PSYC 2320 - Social Psychology

Meets MN Transfer Curriculum Goal Area 5 - History/Social, Behavioral Sciences. Social psychology is the scientific study of the way people think about, feel, and behave in social situations. It involves understanding how people influence, and are influenced by the others around them. This course is an introduction to the research methods, empirical findings and the perspectives of social psychology. The course covers topics such as: Social Attribution and Social Cognition, The Social Self, Social Influence, Group Processes, Interpersonal Attraction and Relationships, Altruism, Aggression, Stereotyping, Prejudice and Discrimination.

Student Learning Outcomes:

- * Identify the major concepts and theoretical approaches in psychological social psychology such as self-perception theory, attribution theories, and cognitive dissonance.

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

- * Demonstrate knowledge of research methods and ethical responsibilities in social psychological research, and in psychology.
 - * Critically evaluate research in psychological social psychology.
 - * Apply social psychological theories or concepts to real world and/or personal examples.
 - * Analyze oneself and others as social beings subject to situational influences.
 - * Relate social behavior to cultural context.
 - * Relate social behavior to biological and evolutionary factors.
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

PSYC 2330 - Statistics for Psychology/Behavioral Sciences

Meets MN Transfer Curriculum Goal Area 5 - History/Social, Behavioral Sciences. Students use basic mathematical and computerized procedures to analyze data in the behavioral sciences. Students use statistical software (e.g., SPSS, R, PSpP) to conduct descriptive and inferential data analyses. Students choose and apply statistical procedures to help to answer psychological and behavioral scientific research questions. Students build upon knowledge gained in Statistics to read, interpret, and write APA-style results sections for behavioral science research.

This course is required for the Psychology (Minnesota State Transfer Pathway) [AA-P] program.

Student Learning Outcomes:

- * Demonstrate an understanding of the mathematics and logic behind selecting and applying statistical procedures appropriate for a given hypothesis, scale of measurement, and experimental design.
 - * Perform and describe the statistical procedures commonly used by social scientists including their respective advantages and disadvantages. These include:
 - a) Creating a visual display of data (e.g., bar chart, histogram)
 - b) Measures of central tendency, variability, and frequency distributions.
 - c) Correlational and regression analyses.
 - d) Inferential statistical procedures, including t-tests, ANOVAs, multiple comparison tests, confidence intervals, and effect sizes.
 - e) Nonparametric tests (e.g., chi-square).
 - * Read, interpret, and summarize basic statistical conclusions from psychological and behavioral science sources accurately and critically evaluate the statistical presentations of others.
 - * Interpret statistical findings and graphs in the context of their level of statistical significance, confidence intervals, effect sizes, and underlying assumptions, and explain these findings using common language and conventions of the American Psychological Association.
 - * Use SPSS or another statistical package to build data sets, run univariate analyses, and interpret and display results.
- Prerequisite(s): MATH1300 or MATH 350, and PSYC1300
(4 C: 3 lect/pres, 1 lab, 0 other)

READ 0900 - Reading Fundamentals

This course emphasizes critical reading strategies and develops college level vocabulary. It presents college reading as an active process and focuses on strategies for improving that process to succeed in college level courses. Materials represent a variety of academic disciplines and occupational areas. This course is required for students who score 36-61 on the Reading Accuplacer Test.

Student Learning Outcomes:

- * Identify patterns of organization in expository text.
 - * Identify topic, stated and implied main idea, and major and minor supporting details.
 - * Use vocabulary building and decoding strategies.
 - * Demonstrate digital literacy appropriate for college courses.
 - * Summarize academic and professional reading material.
 - * Apply various notetaking strategies.
 - * Interpret purpose and tone in narrative and expository texts using inferencing techniques.
 - * Distinguish between factual and opinion statements.
- Prerequisite(s): Appropriate Placement Score (3 C: 3 lect/pres, 0 lab, 0 other)

READ 1112 - Study Strategies

Students develop study skills necessary for academic success in college. Students focus on developing personal study habits that aid the student in reaching a desired level of academic accomplishment. Topics include time management,

listening skills, test taking strategies, memory, concentration, college textbook reading techniques, taking lecture notes, learning style preferences, test anxiety, stress and procrastination management, visual note taking strategies, reading and evaluating websites, and academic goal setting.

Student Learning Outcomes:

- * Assess and reflect individual academic strengths and weaknesses
 - * Identify and apply a variety of study skill strategies to increase academic success in college
 - * Develop a personal study plan that is realistic, manageable and uses effective study strategies
 - * Analyze personal application and results of learned study strategies
 - * Assess the use of study strategies through written evaluation
 - * Determine the strategies most effective for their needs and demonstrate adapting them to their specific course tasks and study requirements
 - * Develop and demonstrate skills in evaluating the accuracy and reliability of Internet websites
- Prerequisite(s): ESOL0910, ESOL0920, ESOL0930 or READ0900, ENGL0900 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

SAMG 1200 - Principles of Marketing

Marketing plays an important role in today's successful businesses. This course will provide an overview of the marketing processes and activities which are imperative for students entering the business arena.

This course will focus on marketing as it relates to retailing, advertising, public relations, sales promotions, and sales management in a variety of mediums. Students will be exposed to topics such as strategic marketing, ethical and social responsibilities, selection of target markets, consumer behavior, and international marketing. Students will also study the concepts of product and brand development, pricing decisions, marketing channels, and supply-chain management. Involvement in this course will provide a strong foundation and appreciation for the important role marketing plays in business, society, and everyday life.

Student Learning Outcomes:

- * Learn and apply terminology essential to marketing communications.
 - * Describe the elements of the market mix: Product, Price, Place (Distribution), Promotion and apply to marketing strategies.
 - * Demonstrate how products and services impact customer value perception.
 - * Identify how customers determine value by comparing their benefits to their costs.
 - * Decide how place (distribution) can create a competitive advantage for a company.
 - * Analyze how promotions impact marketing communications with the customer.
 - * Evaluate market segments, target market selection, and market position.
 - * List and examine the benefits of each component in a marketing plan.
 - * Identify and analyze the environmental forces affecting international marketing efforts.
 - * Differentiate between corporate ethics and corporate social responsibility.
 - * Learn and differentiate between the steps of the consumer buying decision process and the business buying decision process.
 - * Calculate product differentiation as it relates to demand, costs, and profits.
 - * Identify the importance of Integrated Marketing Communications (IMC).
- (3 C: 3 lect/pres, 0 lab, 0 other)

SAMG 1206 - Strategic Customer Service

To remain competitive business to business organizations are recognizing the growing demand for delivering superior customer service. This course covers the fundamentals of customer service as it applies to sales, management, marketing, and entrepreneurial professions. Students will become familiar with customer service as part of their career positions and apply strategies for providing quality customer service. Students will study customer service skills, utilize tools, and practice communication techniques necessary for developing positive business to business, retail to consumer, and service industry business relationships.

Student Learning Outcomes:

- * Define customer service and internal customer support systems as it relates to the wholesale distribution process.
- * Understand and define differences between service, wholesale and retail customer service environments and cultures.
- * Recognize and examine consumer-focused behavior and training requirements for serving a diverse customer base.

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

- * Differentiate between internal and external customers in wholesale business environments.
- * Practice customer service verbal, non-verbal, and listening skills related to their service responsibility.
- * Define and calculate the importance of customer loyalty, relationship development, retention, and loss.
- * Define and practice attitude, ethics and developing trust as a customer service provider and specialist.
- * Compare and contrast various customer relationship management systems, technologies, and their utilization as support tools.
- * Examine customer service breakdowns, service recovery, and retention methods.
- * Explore and research both in-bound and out-bound customer call center delivery systems.
- * Practice customer service phone and electronic communications as part of the sales, management and marketing processes.
- * Practice customer service presentations in both one-to-one and group situations for both business to business and retail to consumer environments.
(3 C: 3 lect/pres, 0 lab, 0 other)

SAMG 1211 - Professional Sales Fundamentals

In today's highly competitive market an effective sales approach is important in every industry. In this course students will design a business-to-business sales presentation by defining customers needs, explaining the value customers receive from the organization, and practicing approaches to reach a joint purchasing agreement with clients. This course will focus on the theory and practice of personal selling used by organizations to build long term business relationships.

Student Learning Outcomes:

- * Define personal selling characteristics and practice personal selling style.
- * Distinguish between traditional and trust-based relationship selling and apply to the steps of the selling process.
- * Understand the importance of sales ethics and practice scenarios.
- * Categorize and define types of buyers and apply style flexing while role playing.
- * Explain buying teams and member roles as it applies to an organizations sales team.
- * Describe and utilize various sales tools and their applications in the selling process.
- * Define and practice active and effective listening.
- * Describe and interpret the different forms of verbal and nonverbal communication used in the sales process.
- * Research and recognize the importance of networking.
- * Define and understand your customers business.
- * Understand customer complaints and resolution methods and apply to the business setting.
- * Develop and present the business-to-business (B2B) sales presentations through research, building rapport, determining needs, demonstrating, trial closing, clarifying questions and objections, professional closing techniques, follow-up and use of relationship selling techniques.
(3 C: 3 lect/pres, 0 lab, 0 other)

SAMG 1215 - Principles of Management

This course introduces the basic principles of the management process, including the functional, scientific, and behavioral systems approaches. The course explores management functions of planning, organizing, leading, and controlling through the use of current literature, concepts, theories, models, applications, and case studies. The course also focuses on contemporary trends in quality improvement, team building, motivation, and leadership skills. Applications of these functions and trends are examined from both a local and global perspective.

Student Learning Outcomes:

- * Describe essential management functions, skills and roles
- * Describe organization staffing models
- * Identify and understand the concepts of strategic, tactical, and operational planning and it's direct relationship to organizational goals
- * Identify personal traits and skills of effective leaders
- * Recognize the importance and sources for developing an organizational vision and mission
- * Understand and identify procedures for implementing effective control systems

- * Use key communication channels, evaluate results, and apply to decision making
- * Identify ethical perspectives and practice outlining processes for making ethical decisions
- * Develop an appreciation for corporate social responsibility within small and mid size organizations
- * Explore processes for quality improvement, team building, and leadership development
- * Understand the importance of a team environment and its contribution to the organization
- * Apply both local and global perspectives to all models, theories, and concepts
(3 C: 3 lect/pres, 0 lab, 0 other)

SAMG 1221 - Branding and Promotion

Promotion of products and services for businesses in today's competitive market is undergoing tremendous change. Students entering the workforce will need to have an understanding of promotion to help their companies determine the best means of communicating brand information to consumers. This course covers how the promotion industry works, and what messaging strategies, media options, and promotion measurements support decision making. To apply the theory and concepts of the course students will design a promotion campaign using appropriate media and messages for a target audience.

Student Learning Outcomes:

- * Identify and apply integrated marketing communication (IMC) strategies in branding creation.
- * Describe and categorize the various methods of audience classification for promotion and IMC.
- * Examine trends transforming the promotion industry and its economic and social impact.
- * Explain and describe the process of segmenting, targeting, and positioning (STP) marketing in promotion plan.
- * Discuss how brand communication influences consumer behavior.
- * Evaluate ethical considerations as they relate to brand campaigns.
- * Learn the laws and regulations as they apply to a promotion plan.
- * Describe challenges and opportunities that affect integrated marketing communication in global markets.
- * Evaluate communication methods and strategies for effective promotion.
- * Analyze traditional media and social media options for use in brand campaigns.
- * Examine the importance and growth of sales promotion in the consumer, trade, and business markets.
- * Evaluate the use of direct marketing, event sponsorship, product placement, public relations, and brand entertainment as a means of promotion.
- * Explain the importance of personal selling for optimal representation of a brand.
- * Create, analyze, present, and evaluate an effective brand campaign.
(3 C: 3 lect/pres, 0 lab, 0 other)

SAMG 1236 - Professional Development

In today's highly competitive industries finding a place in a chosen field is a process that takes into account personal interests, education, goals, and abilities. Students will facilitate their transition into the work place and support themselves in defining their professional role in sales, marketing, management, or entrepreneurial careers. This course will also emphasize corporate and civic responsibility and the participation in professional networking activities and organizations. In this course students will develop a professional portfolio which includes setting goals, managing their time and resources, and practicing self-responsibility. Upon completion students will be prepared to market themselves for opportunities in the fields of sales, marketing, or management.

Student Learning Outcomes:

- * Research sales, marketing, and management careers and industries.
- * Assess and incorporate personal strengths and skills in development of portfolio.
- * Develop center of influence contacts by practicing networking and self-promotion at professional organizational events.
- * Build a resume and cover letter that will promote interview success.
- * Research and practice professional dressing for success in the fields of sales, management, and marketing.
- * Practice successful interviewing for sales, marketing, and management careers.
- * Differentiate negotiations of sales, marketing, and management job offers.

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- * Practice various techniques of professional job search etiquette.
 - * Evaluate the process of job offers and rejections.
 - * Research and participate in corporate and civic responsibility activities applicable to career choice.
- (2 C: 2 lect/pres, 0 lab, 0 other)

SAMG 1241 - Internship I

In today's competitive environment employers anticipate employees will have skills to contribute to the successful growth of the business. This course emphasizes the application of classroom skills and concepts to the work place in the areas of customer service, sales, marketing, promotion, or management. The purpose of this course is to provide the student with a relevant work experience. The students will set goals, determine their strengths, and apply them to their internship position. This is course should be completed during the student's first year.

Student Learning Outcomes:

- * Perform duties in the areas of customer service, sales, marketing, promotion, and/or management.
 - * Complete personal strengths assessment and report to internship advisor.
 - * Apply personal strengths to the workplace environment.
 - * Coordinate personal and professional goals with internship supervisor.
 - * Follow policies and procedures of the internship site.
 - * Practice professional business behavior while in the workplace.
 - * Demonstrate time management skills.
 - * Communicate with internship supervisor and advisor regularly to update progress.
 - * Complete and submit required internship packet to internship advisor.
 - * Prepare self-evaluation at mid-term and end of semester for submission to internship advisor.
- Prerequisite(s): SAMG1240, SAMG1236.
(2 C: 0 lect/pres, 0 lab, 2 other)

SAMG 1251 - Financial Strategies for Business

Financial strategies for business require the ability to assess the profitability and effectiveness of the organization. In this course students will analyze and interpret financial documents to assess a business financial condition. Emphasis will be placed on various business forms, the accounting cycle, financial statement analysis, and merchandise strategies for owning or operating a successful business. Upon completion of this course students will be able to make informed strategic financial decisions.

Student Learning Outcomes:

- * Describe the financial variations of legal business forms (sole proprietorship, partnership, and corporation).
 - * Interpret financial statements, including profit and loss, sales data, inventory turnover, and monthly and year-end reports.
 - * Define basic accounting terminology and the accounting cycle.
 - * Interpret the effects of business transactions on the financial statements.
 - * Analyze financial statements to determine ROI (return on investment), profitability, and decisions for maximum returns.
 - * Analyze business scenarios and case studies using financial problem solving and critical thinking skills.
 - * Interpret and analyze merchandising cases to determine appropriate accounting and profitability decisions.
 - * Utilize technology tools to create and analyze financial statements.
 - * Study tax considerations for businesses related to property, income, and sales.
 - * Define the role of banking and payroll record keeping as a function of business operations.
 - * Study insurance coverage and premiums for business.
- Prerequisite(s): BUSM1260.
(3 C: 3 lect/pres, 0 lab, 0 other)

SAMG 2245 - Marketing Strategies

Today strategic marketing managers must address multiple challenges as they try to deliver something of value to their customers. Students in this course will study marketing from the marketing managers perspective. Marketing managers are involved in the design and selection of products, establishing competitive pricing, while distributing products through appropriate channels. This course provides the student practical application of marketing concepts while managing the company's marketing resources. The objective for sales, marketing, and man-

agement professionals is to understand their businesses and the markets in which they operate. Students will create of a Marketing Plan using strategic planning methods as a capstone project of this course.

Student Learning Outcomes:

- * Examine marketing management as it relates to the operation of an organization and the development of its marketing strategy.
 - * Identify and analyze optimal, serviceable market segmentation schemes used by businesses when developing its marketing plan.
 - * Evaluate target markets for profitability and service by the marketers firm.
 - * Communicate succinctly the parameters of that position to a number of different audiences.
 - * Distinguish and assess the qualities of goods and services as they relate to brands and new products.
 - * Predict and illustrate how demand and elasticity enter pricing decisions made by marketers.
 - * Analyze and compare distribution channels of goods and services for efficiency and profitability.
 - * Develop and evaluate marketing goals for an advertising campaign of a company's products, brands, and position in the marketplace.
 - * Evaluate and select media options for an effective integrated marketing communications strategy.
 - * Categorize and compare social media variations as they relate to effective pre and post-purchase information and promotion.
 - * Analyze and interpret customer evaluation process as it translates to customer relationship management (CRM) and customer lifetime value (CLV).
 - * Compare and evaluate market research tools used to gather data used for making marketing decisions.
 - * Develop, present, and evaluate a strategic marketing plan using professional presentation format.
- Prerequisite(s): SAMG1200.
(3 C: 3 lect/pres, 0 lab, 0 other)

SAMG 2255 - Professional Sales Strategies

Today's sales professional is involved in building long-term relationships with customers. Students in this course will develop skills which will help them define their customers businesses, learn how to communicate with a variety of peoples styles, and know the sales process from rapport building through follow-up. Upon successful completion of this course students will have mastered the areas of networking, prospecting, time management, self-leadership, sales territory management, and setting sales goals. Students will build upon the skills they developed in Professional Sales Fundamentals.

Student Learning Outcomes:

- * Plan and practice the sales process from prospecting through follow-up.
 - * Demonstrate prospecting methods, lead generation, and cold calling techniques and apply to the sales process.
 - * Develop network through center of influence contact lists, person-to-person contacts, professional organizations, and print and web resources.
 - * Practice appointment closing call strategies.
 - * Research the use of various sales support technologies.
 - * Utilize value propositions and value statements.
 - * Write sales proposals utilizing pricing strategies and their appropriate use.
 - * Explore sales aids as applied to customer engagement.
 - * Define types of buyers resistance and practice methods to overcome.
 - * Practice and evaluate sales conversations and flexing techniques for various communication styles.
 - * Map sales territory and routes utilizing time management.
 - * Practice self-leadership skills.
 - * Calculate sales goals, budgets, and practice account management techniques.
 - * Study and compare compensation packages.
 - * Study and interpret sales representative contract laws.
- Prerequisite(s): SAMG1211.
(3 C: 3 lect/pres, 0 lab, 0 other)

SAMG 2266 - Internship II

Employers today are demanding technically skilled employees in the areas of customer service, sales, marketing, promotion, and management. To remain competitive in these areas students will complete a work-related experience in a relevant position. This course emphasizes interaction between the student and supervisor with emphasis on the progression to an advanced role in the organiza-

tion. The students will set advanced goals and complete a learning project for their internship position. This course should be completed during the student's final year.

Student Learning Outcomes:

- * Demonstrate work-related competency of advanced marketing, management, customer service, or sales skills in the workplace.
- * Research and complete an applied internship project, in cooperation with internship employer and advisor, while meeting deadlines.
- * Consistently apply internship site policies and procedures to daily tasks.
- * Coordinate personal and professional goals with internship supervisor.
- * Practice professional business behavior according to internship site standards.
- * Demonstrate personal accountability and time management skills.
- * Communicate with internship supervisor and advisor regularly to update progress.
- * Complete and submit required internship packet and learning project to internship advisor.
- * Prepare self-evaluation at mid-term and end of semester for submission to internship advisor.

Prerequisite(s): SAMG1236, SAMG1241.

(2 C: 0 lect/pres, 0 lab, 2 other)

SAMG 2270 - Managing Human Resources

This course focuses on Human Resource Management Issues. The course covers the techniques and legal aspects of recruiting, hiring, firing, promotion, documentation, evaluation, and other areas essential to the personnel function. The course also provides training in job seeking.

Student Learning Outcomes:

- * Understand principle functions of a Human Resource Department
- * Demonstrate understanding of, and laws related to, job analysis, recruitment, interviewing, selection, training, and performance appraisal functions
- * Use Internet as a tool for locating/researching information
- * Learn the importance of employee rights and the proper use of disciplinary actions
- * Understand importance of Equal Employment Opportunity and government regulation of Human Resource functions
- * Learn job seeking skills
- * Understand options of employee benefit programs

Prerequisite(s): SAMG1215.

(3 C: 3 lect/pres, 0 lab, 0 other)

SAMG 2280 - Sales Force Management

The sales force management environment of today is critical to the success and growth of a business. This course presents comprehensive and rigorous coverage of contemporary sales management concepts. Topics are covered from the perspective of a sales manager decision maker. This decision-making perspective is accomplished through discussion of the stages of the sales management process, identifying critical decision areas, and presenting analytical approaches for improved sales force management. Upon completion of this course students will have an understanding of the importance of managing and participating on a sales team.

Student Learning Outcomes:

- * Study and differentiate the relationship between the sales force and the sales manager.
- * Examine and determine organizational strategy levels for an effective sales process.
- * Evaluate and analyze internal sales organization structures.
- * Determine sales force size, territory design, and the allocation of selling effort to maximize company profitability.
- * Identify and analyze recruitment options as it relates to sales force optimization.
- * Examine legal and ethical considerations of sales force selection.
- * Identify and model the steps of the sales training process.
- * Differentiate between styles of sales force leaders and sales force managers.
- * Describe and analyze salary, commission and combination pay plans.
- * Examine and evaluate sales and force reward systems beyond the basic compensation plans.
- * Identify sales force performance issues and compare sales force evaluation tools.

Prerequisite(s): SAMG1215, SAMG1211.

(3 C: 3 lect/pres, 0 lab, 0 other)

SAMG 2285 - Entrepreneurship

This course is designed for prospective small business owners or operators. It is designed to increase their knowledge of the economic and business principles upon which sound small business management is based. Curriculum is built around the basic areas of entrepreneurship / small business management: management, planning, marketing, promotion, financial management, and human resource management.

Student Learning Outcomes:

- * Develop Entrepreneurship/Small Business Management Planning steps
- * Determine Entrepreneurship/Small Business Management, Management philosophies and strategies
- * Understand Entrepreneurship/Small Business Management Marketing and Promotion strategies
- * Determine Entrepreneurship/Small Business Management Financial Management strategies
- * Understand Entrepreneurship/Small Business Management Human Resource Management strategies
- * Develop a Entrepreneurship/Small Business Management Small Business Plan

Prerequisite(s): SAMG1200, SAMG1251 or ACCT1215, SAMG1200.

(3 C: 3 lect/pres, 0 lab, 0 other)

SOCI 1310 - Introduction to Sociology

Meets MN Transfer Curriculum Goal Area 5 - History/Social, Behavioral Sciences. This course introduces students to the scientific study of human interaction at the micro and macro levels. Students will analyze social structure, social relationships, social organization, and stratification to deepen their understanding of how individuals function within larger social contexts. Students will apply sociological data, concepts, and theories to think critically about social institutions.

Student Learning Outcomes:

- * Recognize sociological perspectives.
- * Apply basic sociological concepts to the study of social interactions.
- * Examine social structure, organization, and institutions.
- * Apply sociological research data to analyze social phenomena.
- * Analyze concepts of difference, deviance, and culture.
- * Examine how social interaction influences an individual's development.
- * Use sociological concepts and theories to analyze social institutions.
- * Develop a sociological imagination.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.

(3 C: 3 lect/pres, 0 lab, 0 other)

SOCI 1320 - Social Problems

Meets MN Transfer Goal Area 5 - History and the Social and Behavioral Sciences. This course introduces students to a sociological analysis of social problems. A variety of social issues are analyzed, including race, poverty, population, and inequality. Causes and consequences of social problems are explored to deepen an understanding of the impact of social problems on quality of life. Expect an emphasis on critical thinking as potential solutions are developed through the analysis of data and the application of sociological processes.

Student Learning Outcomes:

- * Identify what constitutes a social problem
- * Examine social issues using sociological processes, approaches and concepts
- * Identify personal values that influence sociological perspectives
- * Demonstrate an appreciation of diverse perspectives on social issues
- * Identify the social interactions involved in social problems
- * Analyze social problems for causative and influencing factors
- * Analyze the impact of social problems on individuals and society
- * Apply sociological data to the understanding of social issues
- * Use critical thinking processes to develop potential solutions for social problems
- * Display the intellectual standards of accuracy, precision, clarity, fairness, completeness and depth

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.

(3 C: 3 lect/pres, 0 lab, 0 other)

SOCI 1350 - Sociology of Marriage and Family

Meets MN Transfer Goal Area 5 - History and the Social and Behavioral Sciences. This course analyzes Marriage and Family from a sociological perspective. The course examines how historical changes, social contexts, economics, gender roles, and social policies affect how we form and maintain families. Marriage

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and family are looked at from both theoretical and practical perspectives.

Student Learning Outcomes:

- * Study historical changes in the concept of family and family structure
 - * Examine the role of love and intimate relationships in our lives
 - * Analyze the impact of courtship practices on marriage
 - * Understand the impact of communication skills on relationships
 - * Analyze the impact of gender, race, ethnicity, class, sexual orientation, and disability status on family dynamics
 - * Examine child-rearing practices and parenting skills
 - * Examine the dynamics of power, violence, and abuse within dating and family relationships
 - * Analyze the effect of social policy on family dynamics
 - * Demonstrate understanding of marriage from a variety of sociological perspectives
 - * Analyze the historical impact popular culture and media has had on American's perceptions about intimate relationships and family life
 - * Learn constructive ways to resolve family conflicts, interpersonal difficulties and developmental/transitional issues and family crises
 - * Improve awareness of individual perspectives on intimate relationships and marriage
 - * Work effectively in collaboration with others within the class
 - * Apply critical thinking skills to achieve clarity, accuracy, precision, depth, and fair-mindedness in the development of sociological thinking
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

SOCI 1360 - The Politics of Food

Meets MN Transfer Goals 5 and 9 - History/Social, Behavioral Sciences and Ethical and Civic Responsibility. Students will examine the various sociological and political dimensions of food. Food will serve as the lens through which students examine larger structural issues in society as they examine how these processes relate to structures of power and inequality. This course explores the social world(s) we live in by analyzing what we eat, where it comes from, who produces it, who prepares it, and how.

Student Learning Outcomes:

- * Examine and evaluate the connections between food, culture, and society
- * Explore the structural relations of power regarding the production, distribution, preparation and consumption of food
- * Apply sociological concepts, theories, methods and findings to the study of food
- * Examine the impacts of corporate dominance on the global food supply
- * Analyze the structure of globalized, industrialized agriculture and food systems
- * Analyze the impact of corporate food structures on farmers and communities
- * Examine how food issues reflect larger social forces
- * Analyze and evaluate current responses to social problems surrounding food and agriculture

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

SOCI 2305 - Environmental Sociology

Meets MN Transfer Goals 5 and 10 - History/Social, Behavioral Sciences and People and the Environment. Students will examine environmental issues from a sociological perspective. The focus will be on social, political, and economic factors which encourage or discourage protection of the natural life support systems of earth. What steps are going to be required to restore our damaged resources and create a sustainable society for future generations? Considering the implications of what we have studied, students will be encouraged to develop a personal philosophy.

Student Learning Outcomes:

- * Analyze the connections between bio-physical and socio-cultural systems
- * Explain research methods social and natural scientists use to investigate the relationship between bio-physical and socio-cultural systems
- * Describe basic social, political, and economic institutional arrangements that are associated with environmental issues
- * Place environmental issues within a social, cultural, and historical context
- * Understand the social and cultural causes of environmental problems
- * Evaluate current challenges and alternative solutions to environmental problems
- * Integrate what they have studied into their own personal philosophy

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

SPAN 1310 - Beginning Spanish I

Meets MN Transfer Goal Area 8 - Global Perspective. This is the first course in a two-semester sequence in Beginning Spanish. Beginning level vocabulary (colors, family, time, basic descriptions) is introduced and then is incorporated into elementary conversations and writing assignments. Grammar presented in the first semester includes present tense of regular and irregular verbs and the future tense. The course covers essential grammar, oral and listening practices, composition and reading. Students are also introduced to the cultures of Spanish-speaking countries, with an emphasis on the differences among them. Linguistic varieties as well as idiomatic differences among Spanish-speaking countries are also introduced.

Student Learning Outcomes:

- * Write grammatically correct sentences in Spanish using increasingly advanced vocabulary
 - * Summarize and explain basic written and spoken Spanish
 - * Apply beginning level grammar and vocabulary to oral communication
 - * Understand the role of a world citizen and the responsibility world citizens share for their common global future
 - * Demonstrate knowledge of cultural, social, religious and linguistic differences among Spanish-speaking countries
 - * Describe political, economic, and cultural elements which influence relations of states and societies in their historical and contemporary dimensions
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(4 C: 4 lect/pres, 0 lab, 0 other)

SPAN 1320 - Beginning Spanish II

Meets MN Transfer Goal 8 - Global Perspective. Beginning Spanish II is the second course in a two-semester sequence in Beginning Spanish. The vocabulary established in Beginning Spanish I is augmented to include vocabulary related to food, clothing, the human body and its diseases, traveling, and the environment. The increased vocabulary furthers the students verbal and writing skills, as well as their comprehension of more complicated reading and listening assignments. Grammar studied in this semester includes the past tenses, the subjunctive, the command forms, the difference between *por* and *para*, direct, indirect and reflexive pronouns, and the comparative. Students continue to study the differences among Spanish-speaking countries, focusing on specific aspects (e.g. food, gender roles, educational system, health, and politics). Linguistic varieties as well as idiomatic differences among Spanish-speaking countries continue to be discussed.

Student Learning Outcomes:

- * Demonstrates increased fluency in reading and speaking
 - * Compose grammatically correct paragraphs and stories in Spanish using increasingly advanced vocabulary and grammatical structures
 - * Decipher and translate Spanish stories with increasingly advanced grammar and vocabulary by developing a deeper reading comprehension
 - * Adopt advanced beginning level Spanish grammar and vocabulary in oral communication.
 - * Summarize the historical and political differences between Spain and its former colonies.
 - * Explain linguistic and cultural differences between Spanish-speaking countries.
- Prerequisite(s): SPAN1310.
(4 C: 4 lect/pres, 0 lab, 0 other)

SPAN 2310 - Intermediate Spanish I

Meets MN Transfer Goal 8 - Global Perspectives. The third semester in the study of the Spanish language further develops grammar, conversation, reading, composition, and listening skills. The students listening skills will be refined in the third semester. Students will learn to listen for general information and for details. They will also develop the ability to listen for specific information. Intermediate Spanish I will stress the correct application of grammar through reading, speaking and writing. The writing skills of students in the third semester will expand from being able to write a paragraph with supporting details to being able to write essays with a sequential order. Original literary works will be read by students in order to develop more advanced vocabulary. These literary pieces will also be analyzed by students in a written and oral format. The people, culture, history and arts of the different Spanish-speaking countries will be covered extensively through upper level readings and videos.

Student Learning Outcomes:

- * Apply grammar rules to spontaneous spoken Spanish.

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.

* Write grammatically correct summaries and essays.
* Use advanced Spanish grammar and vocabulary in oral communication.
* Summarize in written and spoken Spanish, literary works from Spanish-speaking countries
* Interpret, in written and spoken Spanish, literary works from Spanish-speaking countries
* Comprehend and interpret the ramifications of the Spanish Colonization in Latin American
* Compile historical reasons for the differences between the Spanish-speaking countries
Prerequisite(s): SPAN1320.
(4 C: 4 lect/pres, 0 lab, 0 other)

SPAN 2320 - Intermediate Spanish II

Meets MN Transfer Curriculum Goal Areas 6 and 8 - Humanities and Global Perspective. During the fourth semester in the study of the Spanish language students will continue to hone their grammar, reading and composition skills, while focusing on oral communication. The spoken word, as well as the listening skills will be given priority in the last semester of the 4 semester sequence. Students will orally summarize and paraphrase readings and screenings. They will engage in knowledgeable discussions about the cultural and historical information presented in the original work studied in class. The correct application of advanced grammar will still be emphasized through reading, speaking and writing. Students will write persuasive essays as well as short stories in Intermediate Spanish 2. Original literary works will be read and analyzed by students in a written and oral format. The people, culture, history and arts of the different Spanish-speaking countries will be covered extensively through original readings and videos.

Student Learning Outcomes:

- * Generate spoken and written Spanish with advanced grammar and vocabulary
- * Expand the use of Spanish beyond the school setting for life-long learning and participating in a global community
- * Infer and explain social, cultural and political issues reflected in literary works from Spanish-speaking countries
- * Examine historical figures from the Spanish-speaking world within their social and historical background
- * Evaluate a variety of works of art from the Spanish-speaking world within their historical, social, and political background.
- * Create artistic works that express and reflect issues in the Spanish-speaking world

Prerequisite(s): SPAN2310.
(4 C: 4 lect/pres, 0 lab, 0 other)

SPEC 2850 - Special Topics

This course is designed by the student and instructor to meet specialized needs for the individuals program requirements. This course will be used by students needed to demonstrate achievement of specific knowledge for use in completion of program graduation requirements.
(C: 0 lect/pres, 0 lab, 0 other)

SSCI 1300 - Introduction to the Social Sciences

Meets MN Transfer Goal Area 5 - History, Social and Behavioral Sciences. This course provides students an overview of the core concepts and methods of the social sciences. Students examine their world and current national and international issues from the perspectives of anthropology, sociology, political science, history, psychology and economics.

Student Learning Outcomes:

- * Understand and be able to explain the basic concepts and methods of the social sciences
 - * Identify and describe unique contributions made by each of the social sciences
 - * Apply social science concepts and methods to better understand current national and international issues
 - * Understand and be able to give examples of the interconnectedness of the social sciences
 - * Use social science concepts to identify and describe the role power plays in issues such as poverty, homelessness, crime, racism
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

SURG 1400 - Medical Microbiology

This course will enable students to recognize how to prevent the spread of disease and promote wound healing. Students will study the structure and function of microorganisms, the various diseases caused by pathogenic microorganisms, and the methods of transmission of disease. Students will classify wound types and study the wound healing process in conjunction with the body's defenses against disease. Students will also learn to protect themselves by studying the concept of standard precautions. Students will describe the various methods of sterilization and disinfection.

Student Learning Outcomes:

- * Correlate the impact of microbiology in relationship to the practice of sterile technique and infection control in the operative setting.
- * Compare and contrast the structure and characteristics of different microorganisms.
- * Analyze the various immune responses that occur in the body as defenses against invasion by pathogens
- * Describe the wound healing process and the factors affecting this process.
- * Relate the infectious process to surgical practice.
- * Identify the name and function of various parts of the compound microscope.
(2 C: 2 lect/pres, 0 lab, 0 other)

SURG 1404 - Surgical Pharmacology

This course will enable students to assist in the preparation of drugs used in the operating room. Students will distinguish the various uses, routes of administration, equipment needed and possible side effects of these drugs. Emphasis will be placed on the legal and safety aspects of drug administration. The metric and apothecary systems of measure will be studied. Students will convert standard time to military time, do temperature conversions, and learn how to prepare a solution.

Student Learning Outcomes:

- * Analyze the principles of anesthesia administration as well as be able to explain the necessity of each component of anesthesia preparation of the surgical patient.
- * Compare and contrast methods, agents, and techniques of anesthesia administration and preparation.
- * Correlate anesthesia monitoring devices with patient homeostasis.
- * Explain anesthesia complications and interventions.
- * Calculate medication conversions and dosages.
- * Apply general terminology to medication use.
- * Prepare and manage medications and solutions.
- * Use medications in the care of the surgical patient.
- * Describe the legal and safety principles of drug/anesthesia administration in the operating room.
(2 C: 2 lect/pres, 0 lab, 0 other)

SURG 1420 - Operating Room Techniques

This course will enable students to recognize the surgical technologist as an essential part of the medical team providing surgical care to patients in an operating room setting. Students will study the total operating room environment, which includes preoperative, intraoperative and postoperative care. Emphasis will be placed on safety and the principles of aseptic technique.

Student Learning Outcomes:

- * Describe the operating room team and environment
- * Discuss theory relating to preoperative, intraoperative, and postoperative patient care
- * Identify general equipment and supplies related to surgical procedures
- * Identify professional standards and behavior of surgical technologist
- * Discuss operating room policies and procedures, preference cards and documentation
- * Discuss aseptic technique and safety for the student and patient
- * Discuss attitudes toward death and dying and the grief process

Corequisite(s): SURG1404, SURG1424

(3 C: 3 lect/pres, 0 lab, 0 other)

SURG 1424 - Operating Room Techniques Lab

This course will enable students to perform fundamental operating room skills, to identify instruments and to prepare equipment and supplies necessary for surgical case management. Included will be a basic knowledge of Information Technology, Electricity and Robotics. Students will accomplish this by having the opportunity to observe, practice and demonstrate these skills in a mock operating

room lab setting. Emphasis will be placed on demonstrating the principles of aseptic technique as they apply to skills inherent in the scrub role of the surgical technologist and assistant circulator.

Student Learning Outcomes:

- * Classify, identify and pass instruments in specific sets.
 - * Demonstrate surgical attire and principles of aseptic technique displaying professional behavior.
 - * Demonstrate safe patient care practice preoperatively, intraoperatively and postoperatively for surgical procedure.
 - * Demonstrate operating room preparation preoperatively, intraoperatively and postoperatively for surgical procedure.
 - * Prepare surgical supplies, equipment and instruments necessary for a surgical procedure.
 - * Identify and demonstrate the perioperative duties of the assistant circulator.
 - * Identify and demonstrate the perioperative duties of the surgical technologist.
 - * Demonstrate basic knowledge pertaining to Information Technology, Electricity and Robotics.
- (4 C: 0 lect/pres, 4 lab, 0 other)

SURG 1442 - Surgical Procedures I

This course will enable students to understand various types of surgical procedures. Students will accomplish this by studying surgical anatomy, physiology, pathophysiology and the preoperative, intraoperative and postoperative processes as they relate to each type of surgery. Students will relate the knowledge learned in previous theory courses to specific surgical procedures. The types of surgeries to be studied will include General, Obstetrics and Gynecological, Genitourinary, Otorhinolaryngologic Orthopedic, Ophthalmic, Neurosurgery, Cardiothoracic and Peripheral Vascular. This course will also enable students to seek employment. Students will write a letter of application and a resume and follow-up letter. Students will practice for an interview.

Student Learning Outcomes:

- * Correlate the relevant surgical anatomy, physiology and pathophysiology to the surgical procedure.
 - * Explain diagnostic interventions that are utilized for obtaining a diagnosis.
 - * Discuss specific factors including tissue replacement materials that are unique to the surgical procedure.
 - * List the supplies, equipment and instrumentation needed for the procedure.
 - * Explain the correct order of steps taken during the surgical procedure.
 - * Discuss the postoperative care of the patient according to the procedure.
 - * List the wound classification and correlate to wound management.
 - * Identify surgical procedures according to specialties including General, Obstetrics and Gynecological, Genitourinary, Otorhinolaryngologic Orthopedic, Ophthalmic, Neurosurgery, Cardiothoracic and Peripheral Vascular. See addendum for content of each specialty.
 - * Demonstrate interview techniques and prepare personal resume, cover letter and follow-up letter.
- Prerequisite(s): SURG1400, SURG1404, SURG1420, SURG1424.
(6 C: 6 lect/pres, 0 lab, 0 other)

SURG 1443 - Surgical Procedures II

This course will enable students to understand various types of surgical procedures. Students will accomplish this by studying surgical anatomy, physiology, pathophysiology and the preoperative, intraoperative and postoperative processes as they relate to each type of surgery. Students will relate the knowledge learned in previous theory courses to specific surgical procedures. The types of cases to be studied will include surgeries performed in Oral/Maxillofacial and Plastic/Reconstructive specialties.

Student Learning Outcomes:

- * Correlate the relevant surgical anatomy, physiology and pathophysiology to the surgical procedure.
- * Explain diagnostic interventions that are utilized for obtaining a diagnosis.
- * Discuss specific factors including tissue replacement materials that are unique to the surgical procedure.
- * List the supplies, equipment and instrumentation needed for the procedure.
- * Explain the correct order of steps taken during the surgical procedure.
- * Discuss the postoperative care of the patient according to the procedure.
- * List the wound classification and correlate to wound management.

* Identify surgical procedures according to specialties including Oral/Maxillofacial and Plastic/Reconstructive surgery. See addendum for content of each specialty.

Prerequisite(s): SURG1442.

(1 C: 1 lect/pres, 0 lab, 0 other)

SURG 1462 - Operating Room Clinical Lab I

This course will start you on the road to becoming a functional member of the surgical team in the capacity of a surgical technologist. The student will implement skills learned in prior surgical technology theory and lab courses. The student will be scrubbing for a variety of surgical procedures and assisting the circulating nurse. The student will also be working with central processing, unit support, and instrument room personnel. The complexity of duties will increase as the semester progresses. During this semester, the student will have two rotations at area health care institutions. The student must pass the 1st rotation in order to continue on to the 2nd rotation.

Student Learning Outcomes:

- * Perform pre-operative skills specific to surgical technologist
- * Perform intra-operative skills specific to surgical technologist
- * Perform post-operative skills specific to surgical technologist
- * Evaluate your performance
- * Work towards independence
- * Assist with support personnel duties
- * Assist circulating nurse with perioperative duties including documentation
- * Evaluate patient follow through from admissions, to surgery, to PACU and to discharge
- * Exhibit professionalism
- * Display dependability
- * Demonstrate the practices of Aseptic Technique

Meet the clinical case requirements set forth by the AST; Core Curriculum for Surgical Technology Sixth Edition. Refer to official course syllabus and outline, clinical folder and/or Surgical Technology O.R. Clinical Student Handbook for detailed description of Surgical Rotation Case Requirements.

Corequisite(s): SURG1442

Prerequisite(s): EMSC1480, SURG1424 must be taken in the semester immediately preceding SURG 1462.

(14 C: 0 lect/pres, 14 lab, 0 other)

SURG 1463 - O.R. Clinical Lab II

This course will enable the student to be a functional member of the surgical team in the capacity of a surgical technologist. During this 3-week rotation, the student will become an independent practitioner by performing all of the duties of a surgical technologist in the cases the student is assigned to scrub. The student will sharpen the skills learned in prior surgical technology theory and lab courses. The student will complete any experience with the central processing, unit support, and instrument room personnel that was not available to the student in SURG 1462.

Student Learning Outcomes:

- * Perform pre-operative skills specific to a surgical technologist
- * Perform intra-operative skills specific to a surgical technologist
- * Perform post-operative skills specific to a surgical technologist
- * Plan procedural activities from start to finish
- * Integrate procedural activities from start to finish
- * Evaluate your performance
- * Work independently with minimal assistance
- * Assist with support personnel duties
- * Assist circulating nurse with perioperative duties including documentation
- * Evaluate patient follow through from admissions, to surgery, to PACU and to discharge
- * Exhibit professionalism
- * Display dependability

Complete the clinical case requirements set forth by the AST; Core Curriculum for Surgical Technology Sixth Edition. Refer to official course syllabus and outline, clinical folder and/or Surgical Technology O.R. Clinical Student Handbook for detailed description of Surgical Rotation Case Requirements.

Corequisite(s): SURG1443

Prerequisite(s): SURG1462, SURG1442.

(3 C: 0 lect/pres, 3 lab, 0 other)

TECH 1530 - Computer Applications

This is an introductory course in computer applications. This course is designed for students who have no previous computer experience or for those who need a review of basic computer applications. The primary goals of this course are to help individuals acquire a hands-on working knowledge of current personal computer applications including, word-processing, spreadsheet, database, presentation, and internet browser software.

Student Learning Outcomes:

- * Use word-processing software to create, save, print, edit, and format documents
 - * Organize and manage documents
 - * Use spreadsheet software to create, save, print, and edit documents and graphs
 - * Create, save, print, edit, format and enhance graphical presentations
 - * Add visual enhancements to documents and integrate information from multiple applications into one document
 - * Explore the Internet using browser software
 - * Model professional and responsible behavior by being on time, participating in class discussions and completing assignments on time
- (2 C: 0 lect/pres, 2 lab, 0 other)

TECH 1545 - Technical Computations

This course will focus on how to use basic algebraic procedures to transpose formulas/equations and how it applies to specific geometric and trigonometric formulas. Students will acquire data and use it to determine needed information as it relates to their industry. Students will be involved in problem solving as it relates to trade and industrial applications in a lab setting.

Student Learning Outcomes:

- * Transpose formulas to solve for unknown value.
 - * Acquire lab measurements for application to geometric formulas.
 - * Convert units of measurement for specific needs.
 - * Acquire lab measurements for application to right triangle trigonometry.
 - * Acquire lab measurements for application to oblique triangle trigonometry formulas.
 - * Apply critical thinking skills when solving industry related problems.
 - * Utilize a systematic approach to problem solving.
- (3 C: 1 lect/pres, 2 lab, 0 other)

TECH 1550 - Basic CADD

Students will develop a basic knowledge of interactive graphics software manipulation and hardware operations. Students will input drafting commands to develop two dimensional geometry, store and transfer data and output drawings to the plotter for hard copy.

Student Learning Outcomes:

- * Demonstrate start up and shut down procedures for computer software
 - * Manipulate the drawing software
 - * Set up drawing layout and create basic 2 dimensional drawings
 - * Generate completed drawing in hard copy form
 - * Store, transfer and retrieve data
 - * Treat classmates with respect
 - * Demonstrate timeliness in meeting deadlines
- (2 C: 1 lect/pres, 1 lab, 0 other)

TECH 1552 - Basic Metal Joining and Fabrication

This course covers basic welding procedures using arc welding and oxy-fuel equipment. One of the major topics of discussion will be safe use of this equipment. Time will be spent in the lab completing welds in various positions with different processes and electrodes. The processes to be covered in this class will be stick welding (SMAW), wire feed (GMAW), Tig (GTAW) Oxy-Acetylene welding, cutting and brazing along with an introduction to other equipment used in welding shops. Students in this course will be non-welding majors where welding may be a useful tool. Course instruction will stress the many situations where it is advisable to have a skilled welder engaged. Knowing your limitations is of the utmost importance.

Student Learning Outcomes:

- * Apply shop safety practice and proper use of shop equipment
- * Calculate proper voltage, feed speeds, and amperages based on machine operation, conditions, materials, and equipment
- * Identify preferred welding process to be utilized to complete assigned tasks
- * Select appropriate electrodes for specified applications
- * Complete welding projects assigned by the instructor in various positions using

various welding processes

- * Evaluate varied welding processes and applications to your trade
- (2 C: 1 lect/pres, 1 lab, 0 other)

TECH 1554 - Basic Electric Circuits

This course gives students a fundamental understanding of electrical circuits, components, test equipment, and troubleshooting techniques. Students will develop skills in reading electrical prints, using a volt-ohm meter, ammeter, connecting and testing common electrical components: such as switches, relays, solenoids, and motors.

Student Learning Outcomes:

- * Demonstrate safe work habits consistent with industry standards and college policy
 - * Demonstrate the ability to wire a basic electrical circuit as shown by an electrical wiring diagram
 - * Use appropriate instruments to measure voltage, current, resistance and continuity
 - * Differentiate between alternating current and direct current power sources
 - * Troubleshoot and repair faculty electrical circuits
 - * Demonstrate the ability to work as a member of a team
- (2 C: 1 lect/pres, 1 lab, 0 other)

TECH 1556 - Basic Manual - Automated Machining

This course is intended to give the student an introduction into the machining-metalworking world. The student's time will be spent in the lab developing skills in manual machining techniques, using various metals and materials, inspection and measurement of machined features as well as an overview of Computer Numerical Control (CNC) machining and programming. An important part of this class will be the safety concerns of each of the areas being taught. The content of the course will vary somewhat for welding, CADD and electronic students. The electronics students will be given a higher level of automated machining experiences than the welding and CADD students.

Student Learning Outcomes:

- * Demonstrate safety habits consistent with industry standards and college policy
 - * Demonstrate the ability to select proper equipment, set up and operate proficiently
 - * Complete inspection and measurement process as assigned
 - * Demonstrate the ability to work with others
 - * Demonstrate the ability to determine if machined parts meet blueprint requirements
 - * Explain the code necessary for CNC programs
 - * Decipher material types and their characteristics
- (2 C: 1 lect/pres, 1 lab, 0 other)

THTR 1310 - Theatre Appreciation

Meets MN Transfer Goal Area 6 - Humanities and Fine Arts. This course is designed through a broad survey of dramatic text/performance, to improve students' understanding and appreciation of Theatre and Humanity. Through explorations in dramatic literature, as well as recorded and live performance, students will gain insight into Theatre-past and present. We will survey the history of Theatre and the theatre of history, gaining a deeper appreciation of our individual roles in these entwined processes.

Student Learning Outcomes:

- * Define Theatre
 - * Recognize historical/cultural distinctions
 - * Explore the role of Theatre in history
 - * Differentiate types of theatre
 - * Identify themes in theatrical text/performance
 - * Examine themes in specific works of drama
 - * Relate themes to history/society
 - * Apply critical thinking skills to achieve clarity, accuracy, precision, depth, and fair mindedness to reading, speaking, writing, and listening
- Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
- (3 C: 3 lect/pres, 0 lab, 0 other)

THTR 1360 - Acting for Everyone/Beginning Acting/Acting I

Meets MN Transfer Goal 6 - Humanities and Fine Arts. This course is designed, through explorations in the art and craft of acting, to heighten the student's

self-awareness and to improve presentational skills, both individually and in collaboration. Through a series of exploratory exercises, written assignments, and performed presentations, students will engage with and create texts, sharpening analytical skills, and improving understanding of both self and humanity.

Student Learning Outcomes:

- * Develop strategies for research, preparation, and rehearsal of group and individual presentations
- * Demonstrate an understanding and thoughtful evaluation of different emotional states
- * Give thoughtful, rehearsed preparation for presenting academic and creative works
- * Work effectively in collaboration with others
- * Write effectively for different contexts and readers
- * Improve self-awareness and self-confidence
- * Apply critical thinking skills to achieve clarity, accuracy, precision, depth, and fair-mindedness in analyzing texts/performances in classroom discussions and in writing assignments

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.

(3 C: 3 lect/pres, 0 lab, 0 other)

TRAN 1502 - General Service

This course is an introduction to the transportation industry. Materials covered will include an overview of the entire vehicle layout and components and correct procedures and intervals for servicing and maintaining multiple types of vehicles. Students will have a strong emphasis on shop safety, vehicle lifting and hoisting, along with the use of electronic service information, technical service bulletins and repair orders. Students will also be introduced to shop tools and equipment and how to use them correctly and safely. Students will examine many scientific principles and materials that apply to the transportation industry.

Student Learning Outcomes:

- * Apply soft skills and shop safety procedures while working in the lab.
- * Identify service intervals and perform vehicle safety inspections.
- * Demonstrate oil/filter service, serpentine belt/tensioner inspection and replacement, tire services and repair.
- * Comprehend waste handling procedures and comply with EPA and MPCA regulations.
- * Demonstrate minor battery service and replacement using correct procedures and precautions.
- * Perform cooling system test, maintenance and minor repairs to vehicles.
- * Analyze electronic service information and technical service bulletins.
- * Examine the function and operation of entire vehicle's main components and systems.
- * Demonstrate safe and proper use of basic hand tools and shop equipment.
- * Produce a complete repair order.
- * Identify the different types of fasteners and hardware used in the transportation industry.

(2 C: 1 lect/pres, 1 lab, 0 other)

TRAN 1504 - Electricity and Electronic Principles

This is an introductory course to electricity and electronic principles. The student will acquire a basic understanding of voltage, current, and resistance, and how they function and operate in an electrical circuit. The student will study the sources of electricity including chemical reactions, light, heat, and magnetism. Students will learn about solid state devices such as resistors, diodes, and transistors. Lab work will give the students hands-on experience building electrical circuits, and measuring voltage, current, and resistance using digital multi-meters and oscilloscopes.

Student Learning Outcomes:

- * Examine both conventional and electron theory.
- * Identify how voltage, current and resistance is used in an electrical circuit.
- * Develop safe working practices around electricity.
- * Examine how electricity and electrical components are used in vehicle electrical systems.
- * Develop basic diagnostic electrical trouble shooting skills.
- * Understand and use different functions of automotive electrical testing equipment.
- * Identify sources of electricity, and explain the origin, e.g. chemical reaction, light, heat, or magnetism.

(3 C: 1 lect/pres, 2 lab, 0 other)

TRAN 1516 - Scan Tool Data Acquisition

Students will study how to acquire and store data from various automotive computer systems using factory and aftermarket scan tools. Students should be able to describe automotive computer operation and perform service in accordance with manufacturer's procedures.

Student Learning Outcomes:

- * Identify typical automotive computer operation on late model vehicles
- * Demonstrate job entry skill development when performing basic engine monitoring with scan tools
- * Perform a computerized scan analysis
- * Be aware of ethical practices as it relates to engine computer service procedures
- * Exhibit technician/mechanic professionalism

(1 C: 1 lect/pres, 0 lab, 0 other)

TRAN 1518 - Transportation Hazardous Materials

Students enrolled in this class will learn how to identify and to handle hazardous materials found in the transportation industry. Students will access and utilize safety and environmental information. Students will be able to recognize their professional obligation to explore, develop, and implement pollution preventive and safe maintenance practices.

Student Learning Outcomes:

- * Identify shop safety hazards.
- * Determine the effects of hazardous materials and hazardous waste on workers and the environment.
- * Determine methods to reduce or eliminate waste from entering environmental ecosystems.
- * Develop methods to enlighten customers of their environmental responsibilities.
- * Identify Environmental Protection Agency and Minnesota Pollution Control Agency data sources.

(1 C: 1 lect/pres, 0 lab, 0 other)

TRAN 1520 - Workplace Perceptions and Expectations

The workplace is filled with expectations of the employee, employer, and customers. This course will explore issues concerning safety, performance, and workplace ethics. Students completing this course will develop skills to perform successfully in the transportation industry.

Student Learning Outcomes:

- * Communicate effectively in the workplace
- * Emphasize communication skills with co-workers, employers, and customers
- * Utilize knowledge to complete a resume

(2 C: 2 lect/pres, 0 lab, 0 other)

TRAN 2514 - Basic Air Conditioning

This course covers the principles of air conditioning systems, the various types of systems, diagnosis of malfunctions and proper legal procedures for handling refrigerants. Students will learn to test and repair automotive or truck systems. Hands on experience will include evacuating, replacing of defective components, charging and performance testing air conditioning systems.

Student Learning Outcomes:

- * Examine A.C. systems and determine type of system and refrigerant used
- * Observe all EPA regulations and perform AC service in compliance to these regulations
- * Perform partial recharge or complete recharge and performance tests
- * Perform refrigerant reclaiming and recycling procedures
- * Perform refrigerant leak detection using electronic or dye methods

Prerequisite(s): TRAN1502, TRAN1504, TRAN1504 or ABCT1506.

(2 C: 1 lect/pres, 1 lab, 0 other)

WELD 1502 - Welding for Work and Leisure

This course covers basic welding procedures using arc welding and oxy-fuel equipment. One of the major topics of discussion will be safe use of this equipment. Time will be spent in the lab completing welds in various positions with different processes and electrodes. The processes to be covered in this class will be stick welding (SMAW), wire feed (GMAW), Oxy-Acetylene welding, cutting and brazing along with a introduction to other equipment used in welding shops. Students in this course will be non-welding majors where welding may be a useful tool. Course instruction will stress the many situations where it is advisable to have a skilled welder engaged. Knowing your limitations is of the utmost

importance.

Student Learning Outcomes:

- * Apply shop safety practice and proper use of shop equipment.
 - * Calculate proper voltage, feed speeds, and amperages based on machine operation, conditions, materials, and equipment.
 - * Identify preferred welding process to be utilized to complete assigned tasks.
 - * Select appropriate electrodes for specified applications.
 - * Complete welding projects assigned by the instructor in various positions using various welding processes.
- (2 C: 1 lect/pres, 1 lab, 0 other)

WELD 1505 - Arc Welding Processes I

Students will study the uses of these process in industry, fundamentals of the process, and safety concerns connected with the Shielded Metal Arc Welding (SMAW), along with an introduction into Gas Metal Arc Welding (GMAW-S), the types of power sources used with these two processes, and other related safety working conditions in the welding field. Time will be spent in the lab developing skills using the SMAW and GMAW-S processes. Welds will be made in the flat, horizontal, vertical and overhead positions. Written and Fundamental tests will be done in accordance with the American Welding Society (AWS) SENSE curriculum and code books.

Student Learning Outcomes:

- * Demonstrates proper use and inspection of personal protection equipment (PPE).
- * Demonstrates proper safe operation practices in the work area.
- * Demonstrates proper use and inspection of ventilation equipment.
- * Demonstrates proper Hot Zone operation.
- * Demonstrates proper work actions for working in confined spaces.
- * Demonstrates proper use of precautionary labeling and MSDS information.
- * Performs safety inspections of SMAW, GMAW equipment and accessories.
- * Makes minor external repairs to SMAW, GMAW equipment and accessories.
- * Operates and set up for SMAW, GMAW-S operations on carbon steel.

Prerequisite(s): READ0304.

(C: 5 lect/pres,)

WELD 1515 - Thermal Welding and Cutting Process

This course covers the use of oxy-fuel cutting equipment (OFC) when, welding, cutting, brazing, and the use of the Plasma Arc Cutting (PAC) hand held along with CNC operations and Air Carbon Arc Cutting (CAC-A) processes. A very important part of this course will be discussing safety as related to the thermal welding and cutting equipment. Time will be spent in the lab developing skills using the thermal welding and cutting processes. Welds will be made in the flat, horizontal, vertical and overhead positions. Cuts will be made in the flat and horizontal positions. Written and Fundamental tests will be done in accordance with the American Welding Society (AWS) SENSE curriculum and code books.

Student Learning Outcomes:

- * Demonstrate proper use and inspection of personal protection equipment (PPE).
- * Demonstrate proper safe operation practices in the work area.
- * Perform safety inspections of manual OFC, PAC, CAC-A equipment and accessories.
- * Make minor external repairs to manual OFC, PAC, CAC-A equipment and accessories.
- * Operate and sets up for manual, mechanized, and CNC OFC/PAC operations on carbon steel, austenitic stainless steel, and aluminum.
- * Operate and set up for manual CAC-A scarfing and gouging operations on carbon steel.
- * Demonstrate proper inspection and operation of equipment used for each welding and thermal cutting process.

Prerequisite(s): READ0304.

(C: 3 lect/pres,)

WELD 1520 - Metallurgy and Safety in Fabrication

This course covers the study of metals and how to safely join them in the fabrication of weldments to Generally Industries OSHA 10 requirements. Physical and mechanical properties of alloyed materials as they apply to welding, cutting, forming, shaping and heat treating will be covered. The students will do a capstone/developmental research project of manufacturing processes of products being built in manufacturing. There will also be a wide variety of equipment used during this course and several projects will be fabricated. Written and Fundamen-

tal tests will be done in accordance with the American Welding Society (AWS) SENSE curriculum, OSHA and related code books.

Student Learning Outcomes:

- * Demonstrate proper use and inspection of personal protection equipment (PPE).
 - * Demonstrate proper safe operation practices in the work area.
 - * Will complete a General Industry OSHA 10 safety.
 - * Develop an understanding of the terminology used in the study of metals.
 - * Describe the types of tests that are performed on metals to determine their range of usefulness.
 - * Determine the difference between ferrous and nonferrous metals and how the applications will vary.
 - * Fabricate various projects using prints and basic hand tools.
 - * Research manufacturing fabricated products and their material make up's (Capstone/Development Project).
- Prerequisite(s): READ0304.
(3 C: 2 lect/pres, 1 lab, 0 other)

WELD 1529 - Print Reading and Math Applications

The Welding profession requires a good working knowledge of print and math concepts using whole numbers, fractions, decimals and the metric system in conjunction with prints. To accurately layout and fabricate parts the welder will need basic knowledge of print lines, dimensions, notes, and welding symbols. In many instances the welder will be required to calculate the weight and cost of material to fabricate a tank then calculate the capacity, which may be needed in cubic feet, gallons or liters. Written and Fundamental tests will be done in accordance with the American Welding Society (AWS) SENSE curriculum and code books.

Student Learning Outcomes:

- * Interprets basic elements of a drawing or sketch.
- * Interprets welding symbol information.
- * Prepares an applicable bill of materials.
- * Performs conversions of standard inch and metric measurements.
- * Solve the common welding/fabrication workplace problems involving perimeter, area, surface area and volume.

Prerequisite(s): MATH0406 or Appropriate Placement Score.

(C: 2 lect/pres)

WELD 1533 - Fabrication Print Reading

This course brings all the fundamental component of welding blue prints together that make up structures in industry. The student will break down welding blue prints to develop the skill needed to fabricate individual component parts that will makeup welded structures. There will be discussions on the different welding blue prints and symbols in the various organizations in the welding field. Written and Fundamental tests will be done in accordance with the American Welding Society (AWS) SENSE curriculum and code books.

Student Learning Outcomes:

- * Pass AWS SENSE Practical Knowledge of Drawing and Welding Symbol Interpretation
- * Interpret welding symbol information
- * Fabricate parts from a drawing or sketch
- * Prepare an applicable bill of materials
- * Perform conversions of standard inch and metric measurements

Prerequisite(s): WELD1529.

(1 C: 1 lect/pres, 0 lab, 0 other)

WELD 1540 - Arc Welding Processes II

Students will study the fundamentals and the safety concerns of the two wire feeding processes; Gas Metal Arc Welding (GMAW) and Flux Cored Arc Welding (FCAW). Within this study the students will cover five major groups: Power Sources, Shielding Gases, Methods of Transfer, Electrodes, and Limitations. Time will be spent in the lab developing skills using the GMAW, FCAW processes. Welds will be made in the flat, horizontal, vertical and overhead positions. Written and Fundamental tests will be done in accordance with the American Welding Society (AWS) SENSE curriculum and code books.

Student Learning Outcomes:

- * Demonstrate proper use and inspection of personal protection equipment (PPE).
- * Demonstrate proper safe operation practices in the work area.
- * Perform safety inspections of GMAW, FCAW equipment and accessories.
- * Make minor external repairs to GMAW, FCAW equipment and accessories
- * Operate and sets up for FCAW operations on carbon steel.

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* Operate and sets up for GMAW operations on carbon steel, stainless steel, and aluminum.

Prerequisite(s): WELD1505.

(6 C: 1 lect/pres, 5 lab, 0 other)

WELD 1545 - Gas Tungsten Arc Welding

Students will study the fundamentals and safety concerns connected with the Gas Tungsten Arc Welding (GTAW) equipment. Within this study the students will cover five major groups: Power Sources, Shielding Gases, Current Selection, Torch Types, and Limitations. Time will be spent in the lab developing skills using the GTAW process for carbon steel, austenitic stainless steel, and aluminum. Welds will be made in the flat, horizontal, vertical and overhead positions. Written and Fundamental tests will be done in accordance with the American Welding Society (AWS) SENSE curriculum and code books.

Student Learning Outcomes:

- * Demonstrate proper use and inspection of personal protection equipment (PPE).
- * Demonstrate proper safe operation practices in the work area.
- * Perform safety inspections of GTAW equipment and accessories.
- * Make minor external repairs to GTAW equipment and accessories.
- * Operate and sets up for GTAW operations on carbon steel, austenitic stainless steel, and aluminum.

Prerequisite(s): WELD1505.

(4 C: 1 lect/pres, 3 lab, 0 other)

WELD 1558 - Robotics, Inspection, and Testing

Students will study the fundamentals of welding inspection processes and different types of testing that are conducted both destructively and non-destructively to ensure the soundness of the weldments. The students will also gain an understanding of the importance of researching companies to better prepare them in the resume development process, and interview with confidence. Time will be spent in the lab working with a wide variety of equipment to repair and fabricate new weldments. Written and Fundamental tests will be done in accordance with the American Welding Society (AWS) SENSE curriculum and code books.

Student Learning Outcomes:

- * Demonstrate proper use and inspection of personal protection equipment (PPE)
- * Demonstrate proper safe operation practices in the work area
- * Pass AWS SENSE Practical Knowledge of Welding Inspection and Testing
- * Examine cut surfaces and edges of prepared base metal parts
- * Examine tacks, root passes, intermediate layers, and completed welds
- * Understand the importance of cover letters and resumes
- * Fabricate various projects using blueprints and basic hand tools
- * Research employable companies to better prepare for interviewing
- * Develop understanding of filler metals and their proper uses

Prerequisite(s): WELD1520.

(3 C: 2 lect/pres, 1 lab, 0 other)

WETT 1502 - Basic Laboratory Skills

Students will learn basic testing skills, weighing and sampling techniques in order to evaluate the effectiveness and efficiency of water and wastewater treatment processing. Course also includes: laboratory safety, the identification, care, and use of laboratory equipment.

Student Learning Outcomes:

- * Understand the importance and purpose of laboratory safety
- * Perform total coliform procedure and interpret results
- * Conduct basic water tests using Hach kits
- * Identify laboratory equipment, its care and use
- * Perform and interpret results of basic solids analysis of wastewater samples

(1 C: 0 lect/pres, 1 lab, 0 other)

WETT 1506 - Introduction to Water/Wastewater Technology

Students will gain an understanding and develop skills, knowledge, and attitude necessary to be successful in the water and wastewater treatment program. Student will study water and wastewater terminology, identify operator duties, identify different treatment processes, identify sources of water and define water characteristics. Students will also learn the effect of people on public waterways and what treatment processes have been designed to limit these effects. This course will distinctly define the differences between water and wastewater treatment facilities.

Student Learning Outcomes:

- * Identify, and describe treatment facilities and processes utilized in water and wastewater treatment, including collection and distribution systems.
- * Identify the differences between ground water and surface water sources.
- * Identify physical, chemical, biological and radiological characteristics of water and wastewater.
- * Identify regulatory requirements for water and wastewater treatment.
- * Identify operator duties and responsibilities.

(3 C: 3 lect/pres, 0 lab, 0 other)

WETT 1510 - Water / Wastewater Treatment Calculations

Students will perform basic mathematical calculations directly related to the water and wastewater field. This course has a main focus on math theories, but also will include applied mathematical applications. Students must learn the theoretical math before applying the math concepts in practical applications in order to manipulate data and use that data for process control in water and wastewater treatment applications. Upon completion of this course, students will understand the importance of mathematical theories as stated in the course content and topics. The relevance of the math concepts will be applied and further understood in future courses taken in the Water Environment Technologies program. A wide variety of conversions are introduced to the students that specifically relate to the water and wastewater industry.

Student Learning Outcomes:

- * Solve basic mathematical calculations utilized in the water and wastewater industry.
- * Convert units to solve mathematical equations.

(2 C: 2 lect/pres, 0 lab, 0 other)

WETT 1514 - Source Water Treatment and Development

Students will study the treatment and development of both ground and surface water sources. Areas studied will include: well construction and development, pump types and applications, ground and surface water protection, pretreatment of surface water, and water filtration.

Student Learning Outcomes:

- * Identify the three basic types of centrifugal pumps, their applications, and methods of selection.
- * Identify the three categories of positive displacement pumps, their applications, and methods of selection.
- * Determine, by calculation, pumps sizing and pump selections.
- * Understand the importance of meeting well construction codes and preventive maintenance procedures for a public water supply.
- * Explain the process of designing a wellhead protection program.
- * Describe the steps to be followed in conducting a sanitary survey of a water supply.
- * Explain the importance of reservoir and watershed management.
- * Understand the operation and maintenance processes related to gravity and pressure filtration systems.

Prerequisite(s): WETT1506, WETT1510, WETT1502

(4 C: 2 lect/pres, 2 lab, 0 other)

WETT 1518 - Water Plant Operation I

This course assists students to identify and gain knowledge and demonstrate the skills and tasks used in the treatment of raw water and the production of finished drinking water. The tasks and skills reflect tests and operations that are practices in water treatment plants and are based on biological and chemical concepts. The tests are in correlation with Public Health and Environmental Protection Agency Standards.

Student Learning Outcomes:

- * Understand water use, pricing, loss identification and reduction and conservation practices.
- * Explain the purpose and describe the operation of the equipment involved in the aeration process.
- * Describe the function and operation of the coagulation and flocculation process.
- * Calculate chemical feed rates required to achieve proper floc formation.
- * Calculate and explain the concepts of detention time, surface overflow rates, and weir overflow rates as they relate to sedimentation.
- * Perform laboratory analysis and apply the results to operation of a water treatment plant in a safe manner.
- * Demonstrate ability to work, problem solve, and communicate with diverse

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populations both verbally and in writing.

Prerequisite(s): WETT1506, WETT1510, WETT1502

(3 C: 2 lect/pres, 1 lab, 0 other)

WETT 1522 - Water Plant Operation II

Students in this course will continue to study the various techniques and methods required to provide a safe, sanitary water supply for the public. The course will focus on water softening and stabilization techniques currently being applied by water industry. The course also examines water fluoridation and adsorption treatment. Plant operation procedures and evaluation of treatment performance will be analyzed both mechanically and by generating and evaluating laboratory data to verify regulatory compliance.

Student Learning Outcomes:

- * Assess the chemistry of water softening and combine it with operational data to show an understanding of this procedure.
- * Perform pre and post analysis of a water sample in order to determine the adequate chemical dosage required for removal of hardness, turbidity and color using safe and efficient procedures.
- * Investigate the importance of providing a stable water supply from both a health and economic perspective.
- * Judge the importance and application situations of using adsorption as a water treatment alternative.

* Evaluate the chemicals used to fluoridate a water supply and compare techniques used to feed and apply by calculating and monitoring dosages.

* Demonstrate ability to work, solve problems, and communicate with others both verbally and in writing.

Prerequisite(s): WETT1518.

(3 C: 2 lect/pres, 1 lab, 0 other)

WETT 1526 - Water Distribution Systems

Students will be exposed to all operational design and maintenance characteristics of water distribution systems. This will include storage facilities, pump stations, distribution piping, valves, and fittings and associated hydraulics. The course will include a 40-hour internship at a water treatment facility.

Student Learning Outcomes:

* Knowledge of selection, application, and operation of various valves and fittings

* List different types of pipe materials and their application

* Operate and maintain fire hydrants

* Describe different types of storage tanks and the proper application of each type

* Perform a direct tap and a tap using a saddle into a water main

* Perform pipe flow capacity and head loss calculations on a distribution system

* Describe the operation of residential water meters

* Define cross-connections and explain the application of the different types of backflow preventers

Prerequisite(s): WETT1506, WETT1510, WETT1502

(3 C: 1 lect/pres, 2 lab, 0 other)

WETT 1530 - Understanding OSHA Safety Regulations in the Water Industry

Students will study the intent of the OSHA regulations as they pertain to the safety of the individual in the water industry. Students will obtain an understanding of the development of OSHA. Students will also construct a facility safety and health manual based on the knowledge obtained in the classroom and information gathered through research and observation at a local utility

Student Learning Outcomes:

* Investigate the history of OSHA and the reasons for its development.

* Judge the importance of management and employee involvement in a safety program.

* Assess the primary hazards involved in the water industry.

* Develop a job hazard analysis presentation.

* Generate a safety presentation using the seven steps of presenting a safety program.

* Construct and develop a utility safety manual.

(3 C: 3 lect/pres, 0 lab, 0 other)

WETT 1534 - Wastewater Plant Operation I

This course will assist students in understanding lift stations, preliminary, primary

and secondary operations and process control at a wastewater treatment facility. Students will understand the importance of various treatment process steps, the order of operation and the purpose of each. The handlings of solid wastes from a wastewater treatment facility are introduced in this course. The concept of rotating biological contactors and trickling filter operations and maintenance will be presented as the secondary processes. Process control of the various stages of treatment is a major focus of this course. Students will be presented with the opportunity to demonstrate control strategies, safety practices, ability to solve mechanical, flow and pollution problems. The lab component in this class will address specific analytical methods directly associated with the treatment processes involved.

Student Learning Outcomes:

* Identify, distinguish and differentiate between treatment processes and control techniques for lift stations, preliminary treatment, primary treatment and secondary treatment within a wastewater treatment facility.

* Relate control parameters with lab analysis associated with individual treatment processes.

* Identify potential hazards in a wastewater treatment facility and lab settings.

* Demonstrate the knowledge and ability to identify and correct unsafe and/or harmful conditions.

* Inspect and classify lift stations and describe their function in a wastewater collection system.

* Compute mathematical functions relative to the operation of wastewater treatment processes.

* Examine and assist with real-life treatment facility operations and problem solving.

* Demonstrate ability to work with others, problem solve and communicate, orally and in writing.

* Cooperate with other learners and instructional staff through group projects and in lab settings.

Prerequisite(s): WETT1502, WETT1506, WETT1510.

(3 C: 2 lect/pres, 1 lab, 0 other)

WETT 1538 - Wastewater Plant Operations II

Students will gain an understanding and develop skills, knowledge, and attitude necessary to be successful with controlling processes that occur in Activated Sludge, Stabilization Pond and Septic systems. The student will identify problems that occur in each of these processes and develop skills necessary to troubleshoot and solve the problems. The laboratory component presented in this course will require a synthesis of prior theory and practice.

Student Learning Outcomes:

* Identify, distinguish and describe treatment processes and control techniques for pond systems, septic systems and activated sludge systems

* Perform lab tests and relate control parameters to lab analysis results associated with individual treatment processes and the overall treatment facility

* Complete necessary forms and reports required by regulatory agencies

* Calculate flows, chemical dosages, detention times and other mathematical computations associated with operation and control of treatment facilities

* Observe and assist with real-life treatment facility operations and problem solving

* Demonstrate ability to cooperate and work with others, troubleshoot systems, problem solve and communicate, orally and in writing

Prerequisite(s): WETT1534

(4 C: 2 lect/pres, 2 lab, 0 other)

WETT 1542 - Wastewater Laboratory Procedures

Students will receive the opportunity to observe, perform and demonstrate their abilities with a wide variety of water and wastewater tests commonly performed at a water and/or wastewater treatment facility. Students will interact with other students while performing sampling, preservation and handling of samples as well as when running on analysis. Students will be working in a variety of groups and sharing ideas and skills necessary and expected throughout the industry in performing standardized tests. Students will be required to generate lab reports and complete standard regulatory forms with their data generated from their lab results.

Student Learning Outcomes:

* Develop a lab procedure manual containing lab procedures for a wastewater treatment facility

* Complete lab analysis (including quality control), develop procedural tech-

niques and relate lab results to wastewater treatment facility operation and control

- * Organize, manipulate, formulate, and complete lab spreadsheets, forms and reports required by employers and regulatory agencies
 - * Calculate loading rates, percentages, and other mathematical computations related to the data developed from lab analysis
 - * Identify and explain the use of lab ware and electronic equipment used during lab analysis
 - * Demonstrate the ability to interact, collaborate, communicate, listen, assist, communicate orally and in writing and share responsibilities with lab partners
- Prerequisite(s): WETT1502, WETT1506, WETT1510.
(3 C: 1 lect/pres, 2 lab, 0 other)

WETT 1546 - Collection and Disinfection Systems Operation

This course will prepare students for the operation and maintenance of wastewater collection systems and disinfection methods employed in water and wastewater treatment systems. The installation and maintenance of the equipment required by these systems will be explored. Disinfection by chlorination will be the main focus of the disinfection methods discussed. Calculations of chemical dosages safety practices involved with handling chemicals will also be included in the study of collection and disinfection systems. Lab analysis and interpretation of lab data will be demonstrated and practiced to ensure comprehension and understanding of these systems.

Student Learning Outcomes:

- * Examine collection and disinfection systems.
- * Select analytical methods used for disinfection of waters and wastewaters.
- * Inspect and explain the mechanical equipment and uses of the equipment in the chlorine feed system.
- * Calculate flows, chemical dosages and feed-rates, percent solutions and other mathematical computations associated with chemical additions.
- * Assess methods of lift-station and collection system operation and maintenance, and safety policies in accordance with industry standards.

Prerequisite(s): WETT1502, WETT1506, WETT1510.

(3 C: 2 lect/pres, 1 lab, 0 other)

WETT 1550 - Strategic Planning for Success

This course is designed to synthesis all courses in the Water Environment Technologies program. The process of synthesis will assist students in passing their state class D certification examination. Students will also complete the process of researching and applying for employment using a variety of methods learned, in the water and wastewater industry.

Student Learning Outcomes:

- * Develop and produce a resume, cover letter and thank you letter.
- * Assess and explore sources of employment, identify job opportunities and submit applications for employment.
- * Accept interviews and judge self-assessments in relation to employment potential.
- * Solve mathematical problems associated with the operation and control of water and wastewater treatment facilities.
- * Criticize and assist with real-life treatment facility operations and problem solving.
- * Compile data in preparation for sitting of state water and wastewater examinations.
- * Demonstrate ability to listen, organize, creatively think and develop, and communicate orally and in writing.

Corequisite(s): WETT1546

Prerequisite(s): WETT1554, WETT1502, WETT1506, WETT1510, WETT1514, WETT1522, WETT1526, WETT1538, WETT1542.

(3 C: 3 lect/pres, 0 lab, 0 other)

WETT 1554 - Automated Control Systems

Students will comprehend basic electrical concepts used to analyze electrical consumption and assist in environmental protection through consumption reduction. Students will also develop an understanding of the motors and control panels used in the operation of water and wastewater treatment processes. The operation of various types of instrumentation, monitoring equipment and other control devices will be understood and utilized by the students.

Student Learning Outcomes:

- * Clarify the fundamentals of AC and DC electricity.
- * Demonstrate ability to use multi-meters, check line voltage, amperage draws

and resistance in an electrical system.

- * Demonstrate ability to operate various types of instrumentation used in treatment control processes to include remote sites, booster stations and reservoirs.
- * Troubleshoot and solve problems associated with electronic control devices.
- * Demonstrate ability to work, problem solve and communicate, orally and in writing.
- * Differentiate between single phase and 3 phase electrical systems
- * Operate various electrical control panels, monitoring equipment and chemical feed systems.

Prerequisite(s): WETT1502, WETT1506, WETT1510.

(3 C: 1 lect/pres, 2 lab, 0 other)

WETT 1558 - Understanding the EPA Part 503 Biosolids Rule

This course is designed to assist students with the interpretation and understanding of the rules and regulations set forth by the federal and state agencies relating to biosolids. Students will study the comprehensive requirements for the management and disposal of biosolids generated during the process of treating municipal wastewater. This course will also help prepare students in obtaining a type IV biosolids operators license upon meeting the state and federal requirements for biosolids application. Use of the D2L online learning environment may be utilized in this class.

Student Learning Outcomes:

- * Identify and describe the main subparts of CFR part 503.
- * Examine the requirements for biosolids classification.
- * Recommend forms and reports required by regulatory agencies.
- * Calculate biosolids loading and application rates and other mathematical computations associated with operation and control of biosolids.
- * Classify and explain the importance of management practices and record keeping.
- * Argue and recommend potential violations and penalties.
- * Observe and/or assist with the application of biosolids to a land application site.
- * Identify and adhere to all safety practices associated with Biosolids operations.

Prerequisite(s): WETT1502, WETT1506, WETT1510

(3 C: 3 lect/pres, 0 lab, 0 other)

WMST 1300 - Introduction to Women's Studies

Meets MN Transfer Curriculum Goal Areas 2 and 7 - Critical Thinking and Human Diversity. This course will investigate women's lives, their experiences, contributions, and culture, and the surrounding social structures and societal values, all from the perspective of women. This is an interdisciplinary course that is based on theoretical framework and approaches from a number of disciplines. We will be looking at the patriarchal system that produces and maintains unequal social relationships, and institutional exploitation, both political and economic. We will discover how both women and men can be a part of the process of solving gender inequality.

Student Learning Outcomes:

- * Examine ways women have contributed to society, both historically and in the present, and why women's contributions have been relatively unrecognized.
- * Define and examine the system of patriarchy in the United States, and how it affects each of us.
- * Examine the ways women have both survived oppression and successfully challenged oppression, and the effects of that on women themselves and on society.
- * Examine the destructive potential of the traditional images and stereotypes of our lives, and consider alternatives to these.
- * Discover how historically accepted theories and explanations are rife with prejudice and misunderstanding about women in particular, and humanity in general, and how they impact current beliefs about women.
- * Examine the gender issues deeply imbedded in the most familiar facets of life: family relationships, work, education, media, religion, and other popular culture.
- * Examine the ways sexism is promoted and maintained on the personal, institutional, and cultural level.
- * Examine the intersections of sexism and racism, ethnocentrism, heterosexism, classism and ageism.

- * Identify and analyze the major themes of gender roles, including the images of male and female ideals, roles, and expectations of gender as they have been expressed in aspects of our culture and institutions.
- * Examine the role that the cultural definition of masculinity plays in violence

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against women and maintaining unequal power structure.

* Explain how both women and men can be a part of the process of solving gender inequality.

Prerequisite(s): ENGL1308 and READ 1112 or Appropriate Placement Score.
(3 C: 3 lect/pres, 0 lab, 0 other)

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