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.
College Overview
As a highly recognized institution of technology and applied science, 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 12,000 students per year with 80% of the student population drawn from the five-county central MN area. Committed to placing you first, the college’s primary goal is to prepare students for a rewarding career. Over the last decade 97% of SCTCC graduates have found employment in their area of study.

Mission
St. Cloud Technical and Community College prepares students for life-long 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 transferrable education, focused on highly-skilled employment and life-long 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

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. 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 counselor for students with disabilities, Judy Jacobson-Berg, who is located in office 1-410V, or by telephone at 320-308-5096, or 320-308-5988 (ITY).

This publication is available in accessible formats upon request by calling Judy Jacobson-Berg at 320-308-5096. 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 and Counseling Office is located in the north west section of the building. Parking is available in Lot C adjacent to Northway Drive.

Driving Directions:

- From the east on I-94, take the St. Augusta exit #171, travel County 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. Campus will be on your left.

- 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 which becomes Northway Drive. Follow Northway Drive to our campus. Campus will be on your right.

- From Highway 15, take 12th Street East which becomes Northway Drive. Follow Northway Drive to our campus. Campus will be on your right.

- From Highway 10, take Golden Spike Road West (2nd Str. N.). Take a right at Northway Drive. Campus will be on your left.
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ACCREDITATIONS

St. Cloud Technical and Community College is accredited by
The Higher Learning Commission of the North Central Association of College and Schools
30 North LaSalle Street, Suite 2400
Chicago, IL 60602
www.ncahigherlearningcommission.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.

- **Automotives, Auto Body Repair and Medium/Heavy Truck** is 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. Email: megivegivern@caahep.org, http://www.caahep.org.

- **Dental Assisting** is accredited by the Commission on Dental Accreditation (CODA) which is a specialized accrediting body recognized by the United States Department of Education. The Commission can be contacted at (312) 440-4563 or (800) 621-8099 or at 211 East Chicago Avenue, Chicago, IL 60611 or www.ada.org.

- **Dental Hygiene** is accredited by the Commission on Dental Accreditation (CODA) of the American Dental Association, 211 East Chicago Avenue, Chicago, IL 60611, allowing students to sit for national board examinations. CODA contact information: (800) 621-8099 or (312) 440-4653, (800) 621-8099. www.ada.org.

- **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. Email: megivegivern@caahep.org, http://www.caahep.org.

- **Emergency and Safety Education** is approved by the Minnesota Emergency Medical Services Regulatory Board (EMSRB) to teach First Responder and Emergency Medical Technician-Basic and an approved program for the American Heart Association and National Safety Council courses.

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

- **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), 1248 Hardwood Road, Bedford, TX 76021-4244, Telephone: (817) 283-9403.

- **Practical Nursing** 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, (888) 234-2690.

- **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.

- **Water Environmental Technology** 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 Policy

St. Cloud Technical and Community College grants admissions 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. Additionally, the lack of English skills is not a barrier to admission or 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 student 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 admissions into a certain program may enroll in developmental courses designed to help them meet program qualifications.

Before registering for credit courses, a student must be admitted to the college. 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 two weeks prior to the start of any semester or until operating at capacity.

Admissions Procedures

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

1. Submit an SCTCC Application
   Available from the SCTCC Admissions Office, online at http://www.sctc.edu/prospective-students/admissions/how-apply or in the high school guidance office.

2. Pay a $20 Non-refundable Application Fee
   On-line payment is accepted with a credit card when completing the on-line application or please submit payment if mailing a paper version of the application. Students who have previously paid the application fee at SCTCC are exempt from payment.

3. Submit Transcripts
   An official high school transcript or GED scores/certificate must be submitted with the application. Official college transcripts are required from students with previous degrees when transferring credits. Official non-MnSCU college transcripts must be sent directly from the previous college in a sealed envelope.

Students Suspended from Other Institutions

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 into SCTCC will be accepted on probation (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 MnSCU 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. A student who is disqualified as a result of a background check will not be allowed to enter the program major. An individual who is disqualified 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.

International Student Admissions Procedures

International student applicants must submit the following mate-
1. A completed international student application form available from the Admissions Office or on-line at www.sctcc.edu.
2. A $20 non-refundable application fee.
3. An English translation of all official transcripts indicating the completion of high school.
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 transcripts demonstrating a satisfactory level of English proficiency).
6. Health insurance must be purchased through the College upon enrollment.

**Non-Degree Seeking Student Admission**

Persons who are interested in registering for selected courses, but are not interested in pursuing a diploma or degree, are designated by the College as 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 “C” average or better at a regionally 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 using a first year student application. 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 MnSCU transcripts electronically. The student must arrange to have any non-MnSCU transcripts sent to the College.

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

**High School Options**

**Articulated College Credit Student Admission Procedures (Tech Prep)**

St. Cloud Technical and Community College is working with area high schools to provide educational pathways in technical programs for students. Students participate in college-level course work to earn a certificate that transfers to the College.

**Acceptance of Articulated College Credit Certificates**

Articulated college credit certificates will be accepted according to the terms of the agreement between the high school and SCTCC. An incoming student should present the earned certificate to the College during registration. Articulated college credit courses will be noted in summary in the transfer section of the students’ transcript.

**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 high school or student must submit a copy of the articulation agreement. The Registrar will review the agreement 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 around the area and interested students may be required to travel to another high school for a particular course. Courses are taught by SCTCC instructors or specially trained and mentored high school teachers. Students earn college credit and the course is recorded on a college transcript.

Note to counselors, students, and parents: each of the academic programs aligned with these course credits has a university pathway. Ask for the SCTCC/University alignment table if interested. Courses available in 2010-11 include:

- **Health:**
  - Emergency Medical Services I and II

- **Automotive:**
  - Engine Performance
  - Steering and Suspension
  - Brakes
  - Electrical/Electronic Systems

- **Information Technology:**
  - Structured Programming Logic
  - Introduction to Computers
  - IT Essentials
  - Java Language I
If you would like more information about these courses, where they are offered, and how to apply, please contact: Sandy Fabian, Director of Educational Partnerships at St. Cloud Technical and Community College (320)308-5908 or sfabian@sctc.edu.

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 30). 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?
- MN high school juniors in the upper 1/3 of their high school class or who have a cumulative GPA of at least 3.0, or who have college level Accuplacer scores.
- MN high school seniors in the upper 1/2 of their high school class or who have a cumulative GPA of at least 2.5, or who have college level Accuplacer scores.
- Home school or ALC students with college level Accuplacer scores.

Students must pass both the reading and arithmetic portions of the Accuplacer test and may retest only once. There is a $10 charge to retest. If testing accommodations are needed, documentation of disability is required in advance. Testing with accommodations is often scheduled individually. Following retesting, a student who does not meet the entrance requirements may file an appeal for review by the PSEO coordinator. The appeal must consist of a written statement by the student indicating college readiness and at least two letters of recommendation from professionals in the education field stating college readiness in the identified areas.

In addition to acceptance to the College, some college courses may have specific placement score requirements or other prerequisites that students must meet. If the prerequisite 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 college advisor to select courses and with the PSEO advisor to provide a PSEO notice of student registration. The College will set course registration deadlines each semester.

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 three business days prior to the start of the semester. PSEO students will need their class schedule to obtain their books in the college book store.

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 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.

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 suspended from the College for one semester immediately following the occurrence. In addition, the student will be placed on Academic Probation 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.

PSEO students wishing to enroll in only one of the following credit based courses at St. Cloud Technical and Community College; i.e. ASL, CPR, EMT, CNA; may be exempt from application and testing policies. Contact the PSEO coordinator for more 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
(MnSCU 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 Web site at http://www.sctc.edu/security/.
### Ability to Benefit Policy
Students who do not possess a high school diploma or GED certificate will not be eligible to receive financial aid unless they receive a passing score on a test which measures their ability to benefit from the instruction. The test 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. 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 Advising
All students admitted to the College are assigned a program academic advisor. They must meet with their advisor prior to registration. College counselors can also answer questions and are available by appointment for consultation. Call 320-308-5089 or 1-800-222-1009 to schedule a meeting with a program advisor or college counselor.

### Academic Forgiveness
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. Academic Forgiveness may only be granted once and is limited to St. Cloud Technical and Community College coursework. The student:
- 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.
- 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.

### 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 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” must be obtained from Records and Registration and 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 MnSCU Policy 3.3
St. Cloud Technical and Community College requires all applicants, unless exempted, to complete a MnSCU approved academic assessment test before registering for classes. SCTCC uses 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.

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Minimum Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Comprehension</td>
<td>78</td>
</tr>
<tr>
<td>Arithmetic</td>
<td>set by major</td>
</tr>
<tr>
<td>Elementary Algebra</td>
<td>Varies by Course</td>
</tr>
<tr>
<td>College Level Math</td>
<td>62</td>
</tr>
</tbody>
</table>

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.
**Test Exemptions**

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

- Completed 12 or more college level quarter credits, or 8 or more semester credits, with grades of “C” or above from an accredited college or university. Courses completed with grades of “C” or above must include English composition and mathematics. An official college or university transcript is required. If a student earned these credits more than five years ago they are encouraged to take the placement test.
- ACT scores of 24 or above in English, reading, and/or math will exempt students from one or all of the tests. An official ACT Transcripts must be returned to the Admissions Office. The college readiness appeals will be reviewed by the college readiness assessment committee, and the appropriate faculty or academic dean. The student will be notified in writing only if they are exempted.

**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.

**English as a Second Language** Applicants not using English as the first or native language should call (320) 308-5089 or 1-800-222-1009, option 3 to schedule a test designed for non-native English speakers.

**Testing Accommodations** Students who need accommodations (i.e., reader, interpreter, IEP) because of a disability or temporary disabling condition should call the above number to schedule testing. Documentation from a licensed medical practitioner will be required before accommodations can be arranged.

**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 (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 a committee made up of a counselor, a member of the college readiness assessment committee, and the appropriate faculty or academic dean. 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 Business 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. The experience must be documented through a portfolio process, usually won’t exceed one third of the credits needed to complete 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 recommended normal load is 16 credits per semester. The maximum allowable load without special permission is 20 credits. Students who wish to enroll for more than the established maximum must secure permission from their academic advisors. Students wishing to enroll for more than 25 credits must secure permission from a counselor and their academic advisor.

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 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 following system:

- “A” = Superior
- “B” = Very good
- “C” = Average
- “D” = Passing (except specified majors)
- “F” = Failing
- “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.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Grade Points</th>
<th>Credits</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.00</td>
<td>3</td>
<td>12.00</td>
</tr>
<tr>
<td>B</td>
<td>3.00</td>
<td>4</td>
<td>12.00</td>
</tr>
<tr>
<td>C</td>
<td>2.00</td>
<td>4</td>
<td>8.00</td>
</tr>
<tr>
<td>D</td>
<td>1.00</td>
<td>3</td>
<td>3.00</td>
</tr>
<tr>
<td>F</td>
<td>0.00</td>
<td>1</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td></td>
<td><strong>35.00</strong></td>
</tr>
<tr>
<td><strong>GPA Equals</strong></td>
<td><strong>35/15</strong></td>
<td></td>
<td><strong>2.33</strong></td>
</tr>
</tbody>
</table>

Graduation Requirements

The college Graduation Requirements Policy governs the awarding of certificates, diplomas and degrees and is based in part on MnSCU 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 St. Cloud Technical and Community College if they are diploma or certificate students. Students must earn 20 or more credits at St. Cloud Technical and Community College for AA, AAS or AS degrees.
- 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.
- Complete an Application for Graduation Form at least one (1) term prior to the anticipated date of graduation. Forms are available in the Office of Records and Registration.
- Satisfy all requirements per institutional agreement with SCSU where applicable.

- Petition exceptions to program graduation requirements by officially requesting course substitution using an Academic Policy Appeal form. Forms are available in the Office of Records and Registration.
- 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.

Grade changes on all courses must be approved by the appropriate academic dean.

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 in Applied Science (AAS) degree, Associate in Arts (AA) or Associate in 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 in Applied Science Degree (A.A.S.)**
An Associate in 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. 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 in Science (A.S.)**
This 60 credit degree option combines technical education with at least 30 general education credits. Students may also have the option to continue their education by transferring into Southwest State University and earn their Bachelor of Applied Science Degree in Management or Bachelor of Science Degree in Early Childhood Education.

**Associate in Arts (A.A.)**
An Associate in 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. For a list of transfer universities visit: www.mnscu.edu or www.sctc.edu/transfer.

**Bachelor of Applied Science Management (B.A.S.)**
A special arrangement with Southwest Minnesota State University Marshall makes it possible for students to complete a Bachelor of Applied Science Degree in Management on the SCTCC campus. The program is available to students who have successfully earned an A.A.S. degree from SCTCC in Accounting, Finance and Credit, Sales and Management or Supervisory Management or an A.S. degree in Business Management. All classes are held two evenings per week and one weekend (Friday and Saturday) per month. Contact St. Cloud Technical and Community College for more information.

**Bachelor of Science Degree (B.S.) in Early Childhood Education**
A special arrangement with Southwest Minnesota State University (SMSU) makes it possible for students to complete a BS Degree in Early Childhood Education on the SCTCC campus. This degree allows the student to obtain a teacher license for the ages of Birth to Grade 3. This program is available to students who have successfully completed the AS Degree or AAS Degree in the Child and Adult Care and Education (CACE) Program. All classes are currently held one night per week. Contact St. Cloud Technical and Community College for more information.

**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. Check programs that may require courses to be taken in sequence as they may not be offered every semester.

**Repetition of Courses**
A student who receives a grade of D, F or W in courses may repeat these 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. If a student repeats a course in which a grade of C or better was originally earned, the last grade earned will be calculated in the grade point average. 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.

**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.

**Satisfactory Academic Progress**
Students will be expected to maintain a cumulative grade point average (GPA) of 2.0 and complete a minimum of 67% of all attempted credits. Any student who does not maintain the cumulative 2.0 GPA academic requirement, or who does not meet the 67% completion requirement will, at the end of the term, be placed on academic probation (Students remain on probation until these standards are met, or until they meet the criteria for academic suspension listed below). The student must meet with a counselor and their program academic advisor to set up a plan which emphasizes the assistance available through the college to help the student.

1. A student who has been placed on probation and fails to maintain a 2.0 GPA the following term or does not meet the 67% completion rate of all attempted credits, will be suspended from the college for a period of one regular semester (excluding summer).
2. A student who has been suspended must remain out of the college for a period of one semester before being readmitted on probation.
3. A student readmitted after suspension must maintain a term GPA of at least 2.0 and a term completion rate of at least 67%. The student will remain on probation until his or her cumulative GPA is 2.0 or above and cumulative completion rate is 67% or above.
4. A student suspended for the second time must remain out of the college for a period of one full academic year.
Note: It is possible to be in good academic standing at the college, and yet not be in good academic standing in certain programs which require a GPA higher than 2.0. Some programs of study have program handbooks (e.g. Practical Nursing) that outline additional or more rigorous academic program requirements.

**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.

Information on service learning is available from the Office of Educational Partnerships: 320-308-5908.
STUDENT SERVICES

ACADEMIC ACHIEVEMENT CENTER (AACE)

The Academic Achievement Center offers free tutoring for students in academic courses. The AACE is located in room 1-112. Services include tutoring, course software, and study skill tips for the academic environment. The hours of the AACE are Monday – Thursday 8:00 am – 4:00 pm; Friday 8:00 am – 2:00 pm. Other times may be arranged by appointment. Tutoring for math and writing are on a drop-in or scheduled basis. Other courses may have tutors and the hours are listed on a tutor bulletin board inside the AACE. Tutoring generally consists of one to four students working with a tutor. Students in small groups have the advantage of learning from one another. Tutors help find ways to successfully learn course material by clarifying textbook assignments, discussing ideas and reviewing practice problems. Tutors explain and model, but do not complete assignments. Students seeking tutoring help come prepared with the assignment information from the instructor or course resources. Students bring the necessary books or notes and can show their attempts with the assignment. An open, listening attitude from assistance creates a better learning experience. Please visit the AACE website for recommended tutoring and learning links.

http://www.sctc.edu/current-students/student-services/academic-services/academic-achievement-center

CAREER SERVICES

St. Cloud Technical and Community College provides free job 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 room 1-433, provides a variety of reference materials, job and employer information, PCs with internet access, a fax and telephone for job seekers’ 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 student and graduates.
5. Following up on 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 www.sctc.edu/placement.

CHILD CARE

On-campus child care is available for students. Parents must enroll their children before they are allowed to attend. Enrollment and fee structure information may be obtained by calling the Campus Playhouse at (320) 534-0174. The Campus Childcare Center operates from 6:00 am to 6:00 pm. The Center is accredited by the National Association for the Education of Young Children. Child care grants may be available through the Financial Aid Office.

COUNSELING: PERSONAL, ACADEMIC, CAREER

The mission of the Counseling Office is to facilitate students’ academic, career, and personal success. It provides a variety of services, including personal assessment to aid students or prospective students in choosing an appropriate program of study and counseling to assist in the completion of their programs. Licensed counselors adhere to the “Ethical Standards for School Counselors” established by the American School Counselor Association. Students are encouraged to use the counseling service for any type of academic or personal concerns. When appropriate, referrals are made to outside agencies. Appointments are preferred. The Counseling Office may be reached through the Admissions Office at (320) 308-5089.

DIVERSITY SERVICES/MOSAIC

St. Cloud Technical and Community College’s diversity services and MOSAIC programs offer academic, cultural and support services for students and student organizations. Services such as mentoring, text book loan program, study skills workshops, and scholarships provide an environment where all students can succeed. 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: (320)308-5089.

ELL SERVICES

SCTCC employs an ELL coach/coordinator to work with students whose native language is not English. The staff assists students in the admissions and registration process, provides tutoring assistance in the Academic Achievement Center and Writing Center, teaches college-readiness courses for non-native speakers, and is a general resource to any student new to American higher education. Information on ELL services is available through the Admissions Office at (320) 308-5089.
The St. Cloud Technical and Community College is committed to conduct student rights, responsibilities and conduct. Additional information on student life can be found in the Student Handbook. Students may receive a free membership to the YMCA. Sports available to students include: women’s volleyball, women’s basketball, men’s basketball, men’s baseball, and women’s softball. 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. Students may receive a free membership to the YMCA. Additional information on student life can be found in the Student Handbook.
make reasonable accommodations to ensure access to programs, services and activities as required by law. Equal access to communications originated from the College is also assured.

To support these assurances, the College will provide, upon student request and appropriate documentation of disability, reasonable accommodations, academic assistance, and advocacy services. In accordance with the Americans with Disabilities Act, 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.

The process of requesting accommodations begins with completion of an SCTCC Verification of Eligibility for Accommodations form. Forms and requests should be directed to the Counselor for Students with Disabilities. A case-by-case determination will be made to establish eligibility for the requested accommodations. Appropriate accommodations are provided at no cost to the student.

To provide appropriate accommodations to a student with a disability, the college needs documentation of the disability. Documentation must be current, signed by an appropriate professional, and must include assessment results, a diagnosis of disability, and recommended accommodations relevant to disability needs. High School Individual Education Plans (IEP’s) can be included as additional information. These documents are held in a confidential file in order to help better meet disability service needs. Submit documentation and a request for accommodations to Judy Jacobson-Berg, Counselor for Students with Disabilities. Denial of requested accommodations can be appealed by contacting the office of the Vice President of Student Affairs. If you feel that your rights under ADA have not been met, you may file a grievance with the SCTCC ADA coordinator.

Alternate formats of all college materials are available by request, to qualified individuals, by contacting the Counselor for Students with Disabilities. If you need disability related accommodations to make a college event accessible, please contact Judy Jacobson-Berg, Counselor for Students with Disabilities at 320-308-5096 or jjacobsonberg@sctc.edu. TTY users please call MN Relay Service at 711 to contact the college.

Allow plenty of time for the College to supply the necessary services two or more weeks are usually needed to provide sign language interpreters. Textbooks and materials in alternative format often require at least six weeks notice.

For Further Information Please Refer to:

• MnSCU Policy 1B.4
• St. Cloud Technical College Student Handbook
• www.sctc.edu/disability Services
• www.sctc.edu/disabilityServices/accommodations/

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 dependent of a veteran. The Resource Center staff will answer questions or refer you to another office which may be better prepared to give you the right answer. The staff in this office can help you understand your education benefits including:

- Montgomery GI Bill
- GI Bill Kicker
- Student Loan Repayment Program
- Available Scholarships and Grants
- VA Education Programs

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

For information/assistance contact Veterans Services (320) 308-2185, or Financial Aid, (320) 308-5961.

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.
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 Aid 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 Progress Policy can be found at http://www.sctc.edu/financialAid/sap. The Financial Aid 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.ed.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 10 days 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 to pick up in the Business Office. 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’s are received by the Federal Processor after that date will be ineligible for MN State Grants.

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 Academic Competitiveness Grant
First and second-year full-time undergraduates. Must be Pell eligible, U.S. citizen or eligible non-citizen, not in default on federal loans and have no drug conviction while receiving federal aid. Males must be registered for Selective Service.

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.

Minnesota State Achieve Scholarship
Students who graduated from a Minnesota high school in 2008 or later and complete one of a series of college preparation programs described at www.getreadyforcollege.org/achieve may be eligible. Students must also be attending a Minnesota institution and be a U.S. citizen or eligible non-citizen and have a family adjusted gross income of less than $75,000.

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 http://www.sctc.edu/financialAid/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 does not charge 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.

William D. Ford Federal Direct Loan Programs: PLUS
An education loan which parents can borrow on behalf of their dependent children.

SELF Loan
Students enrolled at least half time in an eligible school in Minnesota, or Minnesota residents enrolled in an eligible out-of-state school or in the Canadian province of Manitoba. Co-signer must be U.S. citizen or permanent resident and be credit-worthy.

VETERANS ASSISTANCE
Funding received under the Montgomery GI Bill is typically considered a resource for funding your education. There are some exceptions to this. 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

<table>
<thead>
<tr>
<th>Enrollment Status</th>
<th>Credit Hours</th>
</tr>
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<tbody>
<tr>
<td>Full Time</td>
<td>12 or more</td>
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<tr>
<td>3/4 Time</td>
<td>9-11</td>
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<td>6-8</td>
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<tr>
<td>less than 1/2 time</td>
<td>1-5</td>
</tr>
</tbody>
</table>

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@sctc.edu. Additional information is available at http://www.sctc.edu/financialAid/.
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.sctc.edu/registration/, provides important registration information.

REGISTRATION SESSIONS
All accepted students are required to attend a registration session where they will be advised on course selections before enrolling in college courses. To register for courses, students must have completed the Accuplacer test or been informed they are exempt from testing. Students are exempt if they have completed 12 or more quarter college credits or 8 or more semester credits with passing grades in both math and written composition.

Prior to the registration session, students must complete an on-line orientation session. Failure to complete the on-line orientation will result in delayed registration. St. Cloud Technical and Community College will provide directions and deadlines for completing the orientation process.

Any student who has “stopped out” (not attended classes) for one year or longer, will be required to re-activate their file and complete the on-line orientation session.

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.

2. Meet with faculty advisor. The advisor will review the individual program plan with the student to ensure registration for appropriate courses and to be sure that prerequisites and other education requirements have been met. The student must meet with an advisor in order to obtain a registration access code. The registration access code is necessary to register.
3. Prepare a schedule worksheet to identify time conflicts.
4. Submit immunization information (if needed).
5. Fulfill financial obligations to the College, including parking tickets.
6. Return overdue materials to the Library.
Note: Students who are on academic probation must see a counselor in the Counseling Office prior to registration to complete an academic 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.

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. Education 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-forceful 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.

**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
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)

**Notice to students about Directory Information:**
Students may direct that any or 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. Official transcripts will be $7.00.

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.
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.sctc.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. Students should also request a waiver if they have a current handicapped sticker. Students must show proof of a valid handicapped sticker. 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. Additional permits 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. 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 p.m. to 3:00 p.m. 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.sctc.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 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.sctc.edu/tuition.

REFUNDS, DROPS, WITHDRAWALS, AND WAIVERS, MS CS A 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 on-line).

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”. No course may be withdrawn from after the twelfth week of the semester or after 75% of the class for short-term courses. (Students withdrawing from the college, see below).

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. No withdrawals are allowed after the twelfth week of the semester has been completed. 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 may withdraw from full term courses through the 12th week of the semester or through 75% of the class for shorter courses. 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 the term: 100%
- 6th through 10th class day of the term: 75%
- 11th through 15th class day of the term: 50%
- 16th through 20th class day of the term: 25%
- after 20th class day of the term: 0

Summer term:
- 1st through 5th class day of the term: 100%
- 6th through 10th class day of the term: 50%
- after the 10th 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.

SENIOR CITIZEN FEE
Residents 66 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 a $20 per credit fee. 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 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.sctc.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.sctc.edu/tuition.

**Transcript Fee**
Students may obtain an official transcript of their grades by completing a request for transcripts and paying $7 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 (MnSCU) and/or college policies. Current tuition and fee rates are posted at www.sctc.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 on-line with NBS via the SCTCC web site, http://www.sctc.edu.

Scroll down to GET STARTED.
- Click on Pay for College
- Tuition & Fees
- Online Tuition/Fee Payment
- 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 MnSCU Policy 5.12, payment of tuition and fees will be due 14 calendar days prior to the start of the semester (21 days for summer). 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 on-line.

No invoices or tuition statements are mailed. Accounts must be accessed and paid online at: www.sctc.edu Scroll Down to GET STARTED.
- Pay for College
- Tuition & Fees
- Online Tuition/Fee Payment
- 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. Individuals that submit Non Sufficient Fund (NSF) checks will be subject to a $25 fine and be asked to make restitution by cash, money order or cashier’s 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.

Students will be required to provide documentation with their request.
Welcome to Customized Training and Education Center at St. Cloud Technical and Community College. Course offerings include continuing education, contracted customized training and on-line courses.

Continuing Education Courses are open to the general public. These courses may apply toward professional and personal development, job certification, or advancement requirements of a trade or profession. Course offerings include:

- Forklift Training
- Pharmacy Technician: Exploring A Career
- LPN/RN Refresher
- Phlebotomy
- High-Low Pressure Steam Engineering
- MnDOT Truck Re-Certification
- Truck Driver’s Training Program
- AutoCAD & Inventor

Customized Training Courses are specifically designed to meet the continuing education and training needs of our public and private sector employers. These courses are held at the business site or at the SCTCC campus. Some popular course offerings include:

- Customer Service
- Leadership Training
- Production Manufacturing
- Welding Certificate
- Organizational Development
- Microsoft 2007 Updating

Emergency Medical, Safety Education and Fire Fighting health and safety related programs and courses are offered as CEU, customized, or credit-based and offered in collaboration with local hospitals, police, and ambulance personnel and fire fighters. Course offerings include:

- CPR
- Emergency Medical Technician
- Fire Fighting
- First Responder
- Hazardous Materials
- Emergency Vehicle Defensive Driving for Fire

Motorcycle Training is committed to reducing motorcycle crashes, injuries, and fatalities. The training includes classroom and on-cycle instruction. Courses offered include Basic Rider Course, Experienced Rider Course and Motorized Bicycle (Moped) Course. The curriculum and materials are Safety Foundation (MSF) certified and the instructors are MSF certified.

On-Line Courses include over 300 options through our Ed2Go partnership. Visit the website at www.sctc.edu/training to browse the many course offerings and then try two lessons FREE! Call us at 320-308-0015 or visit our web site for more information. You are just a few clicks away from two free

The Truck Driving Program is a commercial training course that prepares students for CDL driving employment. Many job opportunities exist for seasonal, local, regional, and over-the-road drivers. Some graduates are starting at $50,000 per year. Job placement assistance is available to help students secure employment within the trucking industry.
Accounting Careers
Accounting AAS Degree (72 Credits)

Program Description
The Accounting Careers program prepares students for long-term office positions, as well as to meet the exacting requirements of bookkeeping and accounting. Certain skills are common to all accounting career occupations and are included in all accounting career programs. All accounting careers emphasize analysis, decision-making, and using computers. Students will gain experience working with calculators, microcomputers and microcomputer software.

Prospective students should have an average or above average academic record. Personal qualities which are important are a good aptitude for working with numbers, good vocabulary, strong oral communication skills, organizational ability and attention to detail.

An accountant examines, analyzes and interprets accounting data for the purpose of giving advice and preparing financial statements. Duties may include recording receipts, disbursements, and preparing state and federal reports. The accountant may prepare reports and statements manually or using a computer.

Students graduating with an AAS or Diploma qualify to sit for the Registered Accounting Practitioner exam in the State of Minnesota.

Students successfully completing the degree may choose to further advance their education by obtaining a Bachelor of Applied Science Degree in Management from Southwest Minnesota State University, Marshall. Students attend two evening classes per week and one weekend class per month at St. Cloud Technical and Community College.

Career Opportunities
This program is designed to prepare students as accountants in both private and public accounting. Any business, company, or non-profit enterprise is a great job prospect for an accounting graduate.

Suggested Technical Studies Semester I
ACCT1215 Accounting Principles I ........................................... 4
BUSB1260 Applied Business Mathematics/Calculators ........... 3
BUSB1267 Introduction to Business ........................................ 2
BUSB1275 Business Law .......................................................... 2
CPTR1210 Introduction to Computers .................................. 3

Suggested Technical Studies Semester II
ACCT1216 Accounting Principles II ...................................... 4
ACCT1217 Cost Accounting ....................................................... 4
ACCT1218 Computerized Accounting I .................................. 3
ACCT1219 Spreadsheets-Microsoft Excel ............................. 2
ACCT1220 Payroll Accounting ............................................... 2

Suggested Technical Studies Semester III
ACCT2225 Intermediate Accounting I .................................. 4
ACCT2229 Managerial Accounting ......................................... 4
ACCT2230 Income Tax I ......................................................... 4
ACCT2236 Government and Non-Profit Accounting ............. 2

Suggested Technical Studies Semester IV
ACCT2226 Intermediate Accounting II ................................ 3
ACCT2227 Intermediate Accounting II ................................ 4
ACCT2231 Income Tax II ......................................................... 2
ACCT2234 Auditing ................................................................. 3

ACCT2235 Accounting Comprehensive Review OR
ACCT 1280 Accounting Internship ......................................... 2

General Education
(must include at least three MNTC Goal Areas)
CMST1230 Introduction to Communication Studies ............. 3
ENGL1302 Analytical Writing ................................................. 4
General Education Electives .................................................. 8

Estimated cost of books, supplies and materials: $1,560

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Accounting Careers  
Accounting Clerk Diploma  (35 Credits)

Program Description
The Accounting Careers Program prepares students for long-term office positions, as well as to meet the exacting requirements of bookkeeping and accounting. There is emphasis on analysis, decision-making skills, and using computers.

Students will gain experience working with calculators and computer equipment. As a result of the increasing demand for the application of accounting theory to data processing, students will receive training on microcomputers and microcomputer software.

Prospective students should have an average or above average academic record. Personal qualities which are important are a good aptitude for working with numbers, good vocabulary, strong oral communication skills, organizational ability and attention to detail.

An accountant examines, analyzes and interprets accounting data for the purpose of giving advice and preparing financial statements. Duties may include recording receipts, disbursements, and preparing state and federal reports. The accountant may prepare reports and statements manually or using a computer.

An Accounting Clerk performs any combination of routine calculating, posting, and verifying duties to obtain primary financial data. A clerk maintains accounting records; posts details of business transactions such as receipts, disbursements, checks, and claims; reconciles bank statements; and prepares vouchers, invoices, and other records.

Career Opportunities
Any business, company or non-profit enterprise is a great job prospect for an Accounting Clerk.

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<thead>
<tr>
<th>Suggested Technical Studies Semester I</th>
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<tr>
<td>ACCT1215  Accounting Principles I</td>
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<tr>
<td>BUSM1217  Business Communication</td>
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<td>BUSM1260  Applied Business Mathematics/Calculators</td>
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<tr>
<td>BUSM1267  Introduction to Business</td>
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</tr>
<tr>
<td>BUSM1275  Business Law</td>
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</tr>
<tr>
<td>CPTR1210  Introduction to Computers</td>
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<tr>
<td>ACCT1218  Computerized Accounting I</td>
<td>3</td>
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<tr>
<td>ACCT1219  Spreadsheets-Microsoft Excel</td>
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<tr>
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<td>BUSM1290  Job Seeking/Keeping Skills</td>
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General Studies
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<tr>
<td>ENGL1100  Writing for the Workplace</td>
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<tr>
<td>GBEH1300  Human Relations</td>
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Estimated cost of books, supplies and materials: $794

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
**Accounting Careers**  
*Accounting Diploma (64 Credits)*

**Program Description**

The Accounting Careers Program prepares students for long-term office positions, as well as to meet the exacting requirements of bookkeeping and accounting. Certain skills are common to all accounting career occupations and are included in all accounting career programs. All accounting careers emphasize analysis, decision-making, and using computers. Students will gain experience working with calculators, microcomputers and microcomputer software.

Prospective students should have an average or above average academic record. Personal qualities which are important are a good aptitude for working with numbers, good vocabulary, strong oral communication skills, organizational ability and attention to detail.

An accountant examines, analyzes and interprets accounting data for the purpose of giving advice and preparing financial statements. Duties may include recording receipts, disbursements, and preparing state and federal reports. The accountant may prepare reports and statements manually or using a computer.

Students graduating with an AAS or Diploma qualify to sit for the Registered Accounting Practitioner exam in the State of Minnesota.

Students successfully completing the degree may choose to further advance their education by obtaining a Bachelor of Applied Science Degree in Management from Southwest Minnesota State University, Marshall. Students attend two evening classes per week and one weekend class per month at St. Cloud Technical and Community College.

**Career Opportunities**

This program is designed to prepare students as accountants in both private and public accounting. Any business, company, or non-profit enterprise is a great job prospect for an accounting graduate.

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<table>
<thead>
<tr>
<th>Suggested Technical Studies Semester I</th>
<th>Suggested Technical Studies Semester IV</th>
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<tbody>
<tr>
<td>ACCT1215 Accounting Principles I</td>
<td>ACCT2219 Computerized Accounting II</td>
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<tr>
<td>CPTR1210 Introduction to Computers</td>
<td>ACCT2227 Intermediate Accounting II</td>
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<td>BUSM1260 Applied Business Mathematics/Calculators</td>
<td>ACCT2231 Income Tax II</td>
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<td>BUSM1267 Introduction to Business</td>
<td>ACCT2234 Auditing</td>
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<td>BUSM1275 Business Law</td>
<td>ACCT2235 Accounting Comprehensive Review OR</td>
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<td>ACCT 1280 Accounting Internship</td>
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<td>ACCT1217 Cost Accounting</td>
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<td>ACCT1218 Computerized Accounting I</td>
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<td>ACCT2230 Income Tax I</td>
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<td>ACCT2236 Government and Non-Profit Accounting</td>
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<tr>
<td>BUSM1290 Job Seeking/Keeping Skills</td>
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PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Administrative Support Careers
Administrative Assistant AAS Degree (61 Credits)

Program Description
The Administrative Support AAS Degree prepares a graduate for a variety of administrative and clerical support functions, such as creating correspondence, handling mail, filing manually or electronically, transcribing business correspondence from machine dictation, answering telephones, operating copy/fax equipment, performing accounting transactions, planning and scheduling meetings and appointments, and handling travel and guest arrangements. An administrative assistant will be trained on the most current software packages including word processing, spreadsheets, database, presentation graphics, and desktop publishing. The program consists of core administrative courses designed to develop basic office skills, including keyboarding, oral and written communications, accounting, and computer operations. The program includes general education courses such as Analytical Writing and courses in Mathematics, the Humanities and the Social Sciences.

Career Opportunities
Administrative Support AAS Degree graduates successfully complete internships in a variety of general, legal, medical, educational, and governmental offices. Internship sites serve as potential employment. Graduates are employed in a variety of firms and organizations.

All students are required to purchase a program-specific laptop.

Technical Studies Prerequisites
* 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 5 or fewer errors on a 2 minute timing. Students must show proof with a high school transcript, Tech Prep 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
ADMS1202 Keyboarding/Word Processing ....................... 3
ADMS1207 Office Procedures I ................................. 3
BUSA1217 Business Communications ......................... 3
CPTR1210 Introduction to Computers ......................... 3

Suggested Technical Studies Semester II
ADMS1203 Advanced Keyboarding/Word Processing Appl .... 3
ADMS1208 Office Procedures II ............................... 3
ADMS1210 AAS Practicum ................................. 2
BUSA1212 Customer Relationship Management ............ 3

Suggested Technical Studies Semester III
ADMS1204 Advanced Microsoft Office ......................... 3
ADMS1206 Keyboard Speedbuilding .......................... 1
ADMS2240 Administrative Office Management and Supervision 3
BUSA1260 Applied Business Mathematics/Calculators .... 3

Suggested Technical Studies Semester IV
ADMS2211 Administrative Support AAS Degree Internship .... 3
ADMS2214 Digital Publications ................................. 3
BUSA1275 Business Law ....................................... 2
BUSA1290 Job Seeking/Keeping Skills ........................ 1
BUSA2210 Project Management ............................... 3

General Education
CRTK1300 Introduction to Critical Thinking ................. 3
CMST1320 Introduction to Communication Studies .......... 3
MNTC Goal Area 1 Communications-Written ................ 4
MNTC Goal Area 4 Mathematics and Logic .................. 3
MNTC Goal Area 5 Social Sciences ........................... 3

Estimated cost of books, supplies and materials: $3,900

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Administrative Support Careers
Office Technology Assistant Diploma  (32 Credits)

Program Description
The Office Technology diploma prepares students for employment in the administrative support field. Students will use computer software for document processing and file management tasks. The office technology students will use his/her knowledge of communication, office procedures, and human relations to provide a valuable role in the business organization. In addition, the office technology student may perform duties such as handling mail, filing, and retrieving records, edit and store correspondence, maintain spreadsheets and databases and research on the internet.

Career Opportunities
Graduates of the Office Technology Assistant Program become employed in a variety of businesses. They possess valuable skills and proficiency with office technology used in business everywhere. An individual may obtain office technology employment with these basic skills.

All students are required to purchase a program-specific laptop.

Technical Studies Prerequisites
* 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 5 or fewer errors on a 2 minute timing. Students must show proof with a high school transcript, Tech Prep 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
ADMS1202 Keyboarding/Word Processing .................................. 3
ADMS1207 Office Procedures I .................................................. 3
B USM1217 Business Communications ....................................... 3
B USM1260 Applied Business Mathematics/Calculators ............ 3
C PTR1210 Introduction to Computers ......................................... 3

Suggested Technical Studies Semester II
ADMS1203 Advanced Keyboarding/Word Processing Appl. ...... 3
ADMS1206 Keyboard Speedbuilding .......................................... 1
ADMS1208 Office Procedures II ............................................... 3
ADMS2214 Digital Publications ............................................... 3
B USM1212 Customer Relationship Management .................... 3
B USM1290 Job Seeking/Keeping Skills .................................... 1

General Studies
ENGL1100 Writing for the Workplace ...................................... 3

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

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Advertising Communication And Design

Advertising Communication And Design AAS Degree
(72 Credits)

Program Description
Advertising is a communications tool. The advertising student studies all the various forms of advertising mediums such as newspaper, print, billboards, television and the Internet. Students then develop the design skills and creative talent necessary to the selling of ideas and/or products. They serve to bring the consumer and the producer of products, ideas, together creating a positive outcome for both the business and the economy. With substantial job growth each year, advertising is an exciting career choice with unlimited opportunity for creativity and job advancement. People in the advertising business are said to be the innovators of our times. They show us a vision of our world through print, radio, television, as well as the Internet.

Students are encouraged to participate in the student professional organizations such as DEX (Delta Epsilon Chi), AAF (American Advertising Federation) and The Northway Group (a student run in-house advertising agency). These organizations are designed to further develop and practice the advertising, sales and leadership skills taught in the formal classroom.

Career Opportunities
Employment opportunities exist with advertising agencies, newspapers, in-house advertising departments, magazine publishers, radio and television stations, media companies, direct marketing and outdoor advertising businesses.

Suggested Technical Studies Semester I
ADVR1200 Introduction to Advertising .................. 4
ADVR1211 Computer Design and Layout .............. 3
ADVR1230 Copywriting ................................... 4
ADVR1255 Fundamentals of Design .................. 3

Suggested Technical Studies Semester II
ADVR1216 Drawing with the Computer .............. 4
ADVR1221 Computer Imaging and Editing ........... 3
ADVR1261 Public Relations .............................. 2
ADVR1265 Visual Design .................................. 3
ADVR1270 Media Research and Planning ............ 3

Suggested Technical Studies Semester III
ADVR2206 Ad-Ventures .................................. 2
ADVR2210 Introduction to Photography .............. 3
ADVR2260 Advertising Campaign Development .... 4
ADVR2281 Broadcast ..................................... 4

Suggested Technical Studies Semester IV
ADVR1241 Website Creation and Editing ............ 3
ADVR2250 Retail Advertising ........................... 3
ADVR2285 Portfolio Construction and Presentation 2
ADVR2295 Multimedia/Director ...................... 4

General Education
(must include at least three MNTC Goal Areas)
MNTC Goal Area 1 Oral and Written Communications ....... 7
Fine Arts .................................................. 3
General Education Electives ............................ 8

Estimated cost of books, supplies and materials: $1,350

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Advertising Communication And Design  
*Advertising Communication And Design Diploma  (64 Credits)*

**Program Description**
Advertising is a communications tool. The advertising student studies all the various forms of advertising mediums such as newspaper, print, billboards, television and the Internet. Students then develop the design skills and creative talent necessary to the selling of ideas and/or products. They serve to bring the consumer and the producer of products, ideas, together creating a positive outcome for both the business and the economy. With substantial job growth each year, advertising is an exciting career choice with unlimited opportunity for creativity and job advancement. People in the advertising business are said to be the innovators of our times. They show us a vision of our world through print, radio, television, as well as the Internet.

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**Career Opportunities**
Employment opportunities exist with advertising agencies, newspapers, in-house advertising departments, magazine publishers, radio and television stations, media companies, direct marketing and outdoor advertising businesses.

---

**Suggested Technical Studies Semester I**
- ADVR1200 Introduction to Advertising ........................................ 4
- ADVR1211 Computer Design and Layout ..................................... 3
- ADVR1230 Copywriting .............................................................. 4
- ADVR1255 Fundamentals of Design ............................................. 3

**Suggested Technical Studies Semester II**
- ADVR1216 Drawing with the Computer ....................................... 4
- ADVR1221 Computer Imaging and Editing .................................. 3
- ADVR1261 Public Relations ....................................................... 2
- ADVR1265 Visual Design ............................................................ 3
- ADVR1270 Media Research and Planning .................................... 3

**Suggested Technical Studies Semester III**
- ADVR2206 Ad-Ventures .............................................................. 2
- ADVR2210 Introduction to Photography ....................................... 3
- ADVR2260 Advertising Campaign Development ......................... 4
- ADVR2281 Broadcast ................................................................. 4

**Suggested Technical Studies Semester IV**
- ADVR1240 Multimedia for Web Design ....................................... 3
- ADVR1241 Website Creation and Editing .................................... 3
- ADVR2250 Retail Advertising ..................................................... 3
- ADVR2285 Portfolio Construction and Presentation .................... 2
- ADVR2295 Multimedia/Director ................................................ 4

**General Studies**
- Written Communication ....................................................... 3
- General Studies Electives ...................................................... 4

Estimated cost of books, supplies and materials: $1,350

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**PLEASE NOTE:** All program plans are preliminary and curriculum may change without notice.
Advertising Communication And Design
Advertising Web Page Designer AAS Degree (63 Credits)

Program Description
In this program, students will learn the basics of designing and developing a web site. The courses focus on Web page planning, writing, basic design, layout and construction, setup and maintenance of a Web site. In addition, students will look at design issues specific to web-based presentations, learn web page layout, effective navigation and delve into the design process. Students examine the how-tos, ins and outs and pitfalls of using graphics, color and fonts on web pages as well as working with tables and CSS.

Students gain the ideal combination of web design skills including web basics, design theory, image creation and usage, introduction of the WYSIWYG editors, using HTML, site establishment, advanced issues, testing and evaluation. By mastering key software application and fundamental design principles, students will be able to design, illustrate, compile and produce visual solutions for communications, especially for the Internet.

Students are encouraged to participate in the student professional organizations such as DEX (Delta Epsilon Chi), AAF (American Advertising Federation) and The Northway Group (a student run in-house advertising agency). These organizations are designed to further develop and practice the advertising, sales and leadership skills taught in the formal classroom.

Career Opportunities
Employment areas for web design graduates include creating, updating web pages with corporations, organizations, educational institutions, government agencies, entertainment, advertising agencies, in-house advertising departments, public relations firms, promotions and marketing agencies and other emerging Internet businesses and organizations. Potential career opportunities may include digital media producer, webmaster, project coordinator and more.

Suggested Technical Studies Semester I
ADVR1200 Introduction to Advertising.......................... 4
ADVR1230 Copywriting.................................................. 4
ADVR1255 Fundamentals of Design............................. 3

Suggested Technical Studies Semester II
ADVR1216 Drawing with the Computer......................... 4
ADVR1221 Computer Imaging and Editing......................... 3
ADVR1265 Visual Design............................................. 3

Suggested Technical Studies Semester III
ADVR1235 Web Design Fundamentals.......................... 3
ADVR2206 Ad-Ventures............................................... 2
ADVR2210 Introduction to Photography........................ 3
ADVR2281 Broadcast................................................... 4

Suggested Technical Studies Semester IV
ADVR1240 Multimedia for Web Design.......................... 3
ADVR1241 Website Creation and Editing.......................... 3
ADVR1271 Web Design Project...................................... 2
ADVR2295 Multimedia/Director.................................. 4

General Education
(must include at least three MNTC Goal Areas)
MNTC Goal Area 1 Oral and Written Communications........... 7
General Education Electives........................................... 8
Fine Arts................................................................. 3

Estimated cost of books, supplies and materials: $1,350

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Advertising Communication And Design
Advertising Web Page Designer Diploma (51 Credits)

Program Description

In this program, students will learn the basics of designing and developing a web site. The courses focus on Web page planning, writing, basic design, layout and construction, setup and maintenance of a Web site. In addition, students will look at design issues specific to web-based presentations, learn web page layout, effective navigation and delve into the design process. Students examine the how-tos, ins, outs and pitfalls of using graphics, color and fonts on web pages as well as working with tables and CSS.

Students gain the ideal combination of web design skills including web basics, design theory, image creation and usage, introduction of the WYSIWYG editors, using HTML, site establishment, advanced issues, testing and evaluation. By mastering key software applications and fundamental design principles, students will be able to design, illustrate, compile and produce visual solutions for communications, especially for the Internet.

Students are encouraged to participate in the student professional organizations such as DEX (Delta Epsilon Chi), AAF (American Advertising Federation) and The Northway Group (a student run in-house advertising agency). These organizations are designed to further develop and practice the advertising, sales and leadership skills taught in the formal classroom.

Career Opportunities

Employment areas for web design graduates include creating, updating web pages with corporations, organizations, educational institutions, government agencies, entertainment, advertising agencies, in-house advertising departments, public relations firms, promotions and marketing agencies and other emerging Internet businesses and organizations. Potential career opportunities may include digital media producer, webmaster, project coordinator and more.

Suggested Technical Studies Semester I
ADVR1200 Introduction to Advertising................................. 4
ADVR1230 Copywriting..................................................... 4
ADVR1255 Fundamentals of Design.................................. 3

Suggested Technical Studies Semester II
ADVR1216 Drawing with the Computer......................... 4
ADVR1221 Computer Imaging and Editing ....................... 3
ADVR1265 Visual Design.................................................. 3

Suggested Technical Studies Semester III
ADVR1235 Web Design Fundamentals............................ 3
ADVR2206 Ad-Ventures................................................... 2
ADVR2210 Introduction to Photography......................... 3
ADVR2281 Broadcast...................................................... 4

Suggested Technical Studies Semester IV
ADVR1240 Multimedia for Web Design......................... 3
ADVR1241 Website Creation and Editing......................... 3
ADVR1271 Web Design Project......................................... 2
ADVR2295 Multimedia/Director...................................... 4

General Studies
Written Communication................................................. 3
Fine Arts........................................................................ 3

Estimated cost of books, supplies and materials: $1,350

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

Program Description
American Sign Language (ASL) is the primary visual/gesture language used in the United States and English-speaking parts of Canada. It is the native language of many deaf men and women as well as hearing children born into deaf families. These courses introduce the student to American Sign Language communications at the conversational level.

Career Opportunities
ASL students may find employment in the areas of residential schools for the Deaf, child care centers, real estate, teaching and residential (group) homes, working with the deaf who communicate sign language as their primary language.

Technical Studies

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<td>HASL1404</td>
<td>American Sign Language II</td>
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<td>HASL1408</td>
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<tr>
<td>HASL1412</td>
<td>American Sign Language IV</td>
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PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
**Program Description**

This program is designed to prepare students for employment in the construction industry. The objective of the program is to give students a well-rounded, basic light construction background, along with CAD (computer aided drafting) skills. The program includes designing and drawing 2 and 3 dimensional plans for residential and small commercial buildings, using AutoCAD, AutoCAD Architecture, Revit and SketchUp software. Construction technology, materials, design, blueprint reading and estimating are studied in addition to drafting techniques. The laptop computer format of the program allows students to work on drafting and design projects in a lab setting as well as off-site.

**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.

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**Suggested Technical Studies Semester I**

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<th>Course Title</th>
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<td>ARCH1506</td>
<td>Intro to Architectural CAD</td>
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<td>ARCH1514</td>
<td>Estimating and Construction Fundamentals I</td>
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<td>ARCH1522</td>
<td>Residential Design Principles</td>
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<td>Residential Materials and Methods I</td>
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<td>ARCH2510</td>
<td>Architectural CAD II</td>
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<td>ARCH2522</td>
<td>Commercial Design Principles and Practice</td>
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<td>ARCH2526</td>
<td>Construction Estimating Analysis I</td>
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<td>ARCH2530</td>
<td>Sustainable Building Systems</td>
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**Suggested Technical Studies Semester IV**

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<tr>
<td>ARCH2534</td>
<td>Construction Management and Contracting</td>
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<td>ARCH2538</td>
<td>Construction Estimating Analysis II</td>
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<td>ARCH2542</td>
<td>Structural Building Systems</td>
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<td>ARCH2550</td>
<td>Professional Constructor Seminar</td>
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**General Education**

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<td>CMST1320</td>
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<tr>
<td>ENGL1302</td>
<td>Analytical Writing</td>
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<td>MNTC Goal Area 4</td>
<td>Mathematics and Logic</td>
<td>3</td>
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<td>MNTC Goal Area 5</td>
<td>Social Sciences</td>
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<tr>
<td>MNTC Goal Area 6</td>
<td>Humanities</td>
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General Education Electives: 3

Estimated cost of books, supplies and materials: $2,803

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PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Architectural Construction Technology
Architectural Construction Technology Diploma (64 Credits)

Program Description
This program is designed to prepare students for employment in the construction industry. The objective of the program is to give students a well-rounded, basic light construction background, along with CAD (computer aided drafting) skills. The program includes designing and drawing 2 and 3 dimensional plans for residential and small commercial buildings, using AutoCAD, Auto-CAD Architecture, Revit and SketchUp software. Construction technology, materials, design, blueprint reading and estimating are studied in addition to drafting techniques. The laptop computer format of the program allows students to work on drafting and design projects in a lab setting as well as off-site.

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. (Applies to A. A.S. Degree only)

Suggested Technical Studies Semester I
ARCH1502 Introduction to Architectural Drafting .................... 3
ARCH1506 Intro to Architectural CAD .................................. 3
ARCH1514 Estimating and Construction Fundamentals I .......... 3
ARCH1522 Residential Design Principles ............................ 2
ARCH1526 Residential Materials and Methods I ................. 2

Suggested Technical Studies Semester II
ARCH1510 CAD and Design Studio ................................. 6
ARCH1518 Estimating and Construction Fundamentals II ...... 3
ARCH1530 Residential Materials and Methods II ............... 2
ARCH1534 Residential Design and Presentation .................. 2

Suggested Technical Studies Semester III
ARCH2506 Architectural Design Studio I ............................ 3
ARCH2510 Architectural CAD II ....................................... 3
ARCH2522 Commercial Design Principles and Practice ...... 2
ARCH2526 Construction Estimating Analysis I .................... 3
ARCH2530 Sustainable Building Systems .......................... 2

Suggested Technical Studies Semester IV
ARCH2514 Architectural Design Studio II .......................... 3
ARCH2518 Architectural CAD III ...................................... 3
ARCH2534 Construction Management and Contracting ...... 2
ARCH2538 Construction Estimating Analysis II ................. 3
ARCH2542 Structural Building Systems ............................ 3
ARCH2550 Professional Constructor Seminar .................... 2

General Studies
ENGL1100 Writing for the Workplace ................................ 3
GBEH1300 Human Relations ............................................. 3
General Studies Electives ................................................. 3

Estimated cost of books, supplies and materials: $2,803

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
GENERAL INFORMATION: This degree is intended to constitute the first two years of a baccalaureate degree program. Transferability of courses from St. Cloud Technical and Community College (SCTCC) to public higher education systems in Minnesota is enhanced by transfer agreements that are in place. Transfer standards and procedures adopted by all the public higher education systems in Minnesota insure students' transfer rights. For more information on SCTCC, visit our websites at http://www.sctc.edu.

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.

<table>
<thead>
<tr>
<th>General Education Requirements/MnTC</th>
<th>40 credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution requirements are satisfied through completion of the Minnesota Transfer Curriculum (MnTC) listed below. These two criteria must be met to complete the MnTC:</td>
<td></td>
</tr>
<tr>
<td>1) All ten emphasis areas listed below must be completed.</td>
<td></td>
</tr>
<tr>
<td>2) A total of at least <strong>40 semester</strong> credits from courses listed in the MnTC must be satisfactorily completed. One course may satisfy more than one emphasis area, but the course credits may be counted only once.</td>
<td></td>
</tr>
<tr>
<td>1. Communications (at least two courses)</td>
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</tr>
<tr>
<td><strong>ENGL 1302</strong> Analytical Writing (required)</td>
<td>4 cr</td>
</tr>
<tr>
<td>Choose from:</td>
<td></td>
</tr>
<tr>
<td>CMST 1320 Intro to Communication Studies</td>
<td>3 cr</td>
</tr>
<tr>
<td>CMST 2300 Introduction to Public Speaking</td>
<td>3 cr</td>
</tr>
<tr>
<td>CMST 2310 Interpersonal Communication</td>
<td>3 cr</td>
</tr>
<tr>
<td>2. Critical Thinking (one course)</td>
<td>3 cr</td>
</tr>
<tr>
<td>3. Natural Sciences (two courses from two different disciplines, one must be a laboratory course)</td>
<td>7 cr</td>
</tr>
</tbody>
</table>

| 4. Mathematical/Logical Reasoning |
| **MATH 1300, MATH 1320, MATH 1330, MATH 1350, or PHIL 1340** | 3 cr |

| 5. History and the Social and Behavioral Sciences (three courses from three different disciplines) | 9 cr |

| 6. The Humanities and Fine Arts (three courses from three different disciplines) | 9 cr |

| 7. Human Diversity (two courses) |
| DVRS 1304 required | 6 cr |

| 8. Global Perspective (one course) | 3 cr |

| 9. Ethical and Civic Responsibility (one course) | 3 cr |

| 10. People and the Environment (at least one course) | 3 cr |

| **Wellness Requirement** | 2 cr |
| HPER or PE courses |

**Elective Credit Requirement** | **18 credits** |
The balance of the 60 semester credits for the degree may be met by taking college-level coursework appropriate to the student's transfer program.

**NOTE:** The requirements of this program are subject to change without notice. Students should refer to the current St. Cloud Technical and Community College catalog to determine the limits to earn a degree.
To complete the St. Cloud Technical and Community College version of the Minnesota Transfer Curriculum, all ten emphasis areas listed below must be completed. A total of at least 40 semester credits must be earned. Courses designated with a superscript (e.g., BLGY 1305<sup>5</sup>) satisfy more than one emphasis area. **Note:** Credits are counted only once toward the 40-credit minimum requirement. Students must earn a minimum 2.0 GPA in the MNTC.

<table>
<thead>
<tr>
<th>Emphasis Area</th>
<th>Area 1</th>
<th>Communications (Two courses, seven credits)</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td>Written: ENGL 1302 Analytical Writing, OR</td>
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<tr>
<td></td>
<td></td>
<td>ENGL 2302 Adv. Argument &amp; Research (For students who have taken a 3 credit Comp I at another college)</td>
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<tr>
<td></td>
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<td>Oral (at least one course - choose from): CMST 1320 Intro to Communication Studies, CMST 2300 Intro to Public Speaking, CMST 2310 Interpersonal Communication,</td>
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<tr>
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<td></td>
<td>Electives (no courses required from this category): CMST 2301&lt;sup&gt;1&lt;/sup&gt; Persuasion, CMST 2302 Small Group Communication, ENGL 1301 Technical Writing, ENGL 2310 Intro to Creative Writing</td>
</tr>
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<table>
<thead>
<tr>
<th>Emphasis Area</th>
<th>Area 2</th>
<th>Critical Thinking (One course, three credits required)</th>
</tr>
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<tbody>
<tr>
<td></td>
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<td>CMST 2301&lt;sup&gt;1&lt;/sup&gt; Persuasion, COMM 1330&lt;sup&gt;0&lt;/sup&gt; Media &amp; Social Issues, CRTK 1300&lt;sup&gt;0&lt;/sup&gt; Critical Thinking, PHIL 1340&lt;sup&gt;0&lt;/sup&gt; Intro to Logic, WMST 1300&lt;sup&gt;5&lt;/sup&gt; Intro to Women’s Studies;</td>
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<table>
<thead>
<tr>
<th>Emphasis Area</th>
<th>Area 3</th>
<th>Natural Sciences (seven credits, two courses required from two different disciplines: one must include a laboratory experience (identified with *).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>ASTR 1300&lt;sup&gt;0&lt;/sup&gt; Astronomy , ASTR 1301&lt;sup&gt;0&lt;/sup&gt; Astronomy Lab, BLGY 1305&lt;sup&gt;5&lt;/sup&gt; Environmental Science, BLGY 1315&lt;sup&gt;4&lt;/sup&gt; Natural Resource Conservation, BLGY 1320&lt;sup&gt;0&lt;/sup&gt; Human Biology, BLGY 1325&lt;sup&gt;0&lt;/sup&gt; Nutrition, BLGY 1351&lt;sup&gt;0&lt;/sup&gt; General Biology, BLGY 2310&lt;sup&gt;0&lt;/sup&gt; Human A &amp; P I, BLGY 2320&lt;sup&gt;0&lt;/sup&gt; Human A &amp; P II, BLGY 2330&lt;sup&gt;0&lt;/sup&gt; Microbiology, CHEM 1340&lt;sup&gt;0&lt;/sup&gt; Intro to General Chemistry, CHEM 1341&lt;sup&gt;1&lt;/sup&gt; Introductory Organic and Biochemistry, CHEM1342&lt;sup&gt;4&lt;/sup&gt; Organic and Biological Chemistry, EASC 1310&lt;sup&gt;0&lt;/sup&gt; Meteorology, GEOE1300&lt;sup&gt;0&lt;/sup&gt; Geology, PHYS 1300&lt;sup&gt;5&lt;/sup&gt; General Physics</td>
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<thead>
<tr>
<th>Emphasis Area</th>
<th>Area 4</th>
<th>Mathematical/Logical Reasoning (one course, three credits)</th>
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<tbody>
<tr>
<td></td>
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<td>MATH 1300 College Algebra, MATH 1320 College Trigonometry, MATH 1330&lt;sup&gt;5&lt;/sup&gt; Cultural Mathematics, MATH 1350 Introduction to Statistics, PHIL 1340&lt;sup&gt;0&lt;/sup&gt; Intro to Logic,</td>
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<table>
<thead>
<tr>
<th>Emphasis Area</th>
<th>Area 5</th>
<th>History and the Social and Behavioral Sciences (three courses, nine credits, from three different disciplines required)</th>
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<tbody>
<tr>
<td></td>
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<td>ANTH 1300&lt;sup&gt;0&lt;/sup&gt; Intro to Anthropology, ANTH 2300&lt;sup&gt;0&lt;/sup&gt; Anthropology of Science Fiction, DVRS 1304&lt;sup&gt;7&lt;/sup&gt; Diversity &amp; Social Justice, ECON 1320 Intro to Macroeconomics, ECON 1330 Intro to Microeconomics, GEOG 1300&lt;sup&gt;5&lt;/sup&gt; World Regional Geography, HIST 1310&lt;sup&gt;0&lt;/sup&gt; Am History until 1877, HIST 1311&lt;sup&gt;5&lt;/sup&gt; US Since 1877, HIST 1330&lt;sup&gt;0&lt;/sup&gt; World War II, HIST 1340&lt;sup&gt;0&lt;/sup&gt; Contemporary World History, POLS 1304&lt;sup&gt;0&lt;/sup&gt; Intro to American Politics, POLS 1320&lt;sup&gt;0&lt;/sup&gt; Public Issues, PSYC 1300 Intro to Psychology, PSYC 1304&lt;sup&gt;0&lt;/sup&gt; Life Span Development, PSYC 1310&lt;sup&gt;0&lt;/sup&gt; Psychology of Women, PSYC 2310&lt;sup&gt;0&lt;/sup&gt; Abnormal Psychology, SOCI 1310 Intro to Sociology, SOCI 1320 Social Problems, SOCI 1350 Sociology of Marriage &amp; Family, SOCI 1360&lt;sup&gt;0&lt;/sup&gt; Politics of Food, SOCI 2305&lt;sup&gt;5&lt;/sup&gt; Environmental Sociology, SOCI 3300 Intro to Social Sciences</td>
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<thead>
<tr>
<th>Emphasis Area</th>
<th>Area 6</th>
<th>The Humanities and Fine Arts (three courses, nine credits required from three different disciplines)</th>
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<tbody>
<tr>
<td></td>
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<td>ART 1320&lt;sup&gt;0&lt;/sup&gt; Beginning Drawing, CRTK 1300&lt;sup&gt;0&lt;/sup&gt; Critical Thinking, ENGL 1321 Intro to Modern Fiction, ENGL 1322 Intro to Lit, ENGL 1330&lt;sup&gt;0&lt;/sup&gt; American Lit About War, ENGL 1340&lt;sup&gt;0&lt;/sup&gt; Intro to Multicultural Lit, ENGL 1341 Intro to Women’s Lit, ENGL 1342&lt;sup&gt;0&lt;/sup&gt; Middle Eastern Lit, ENGL 1345&lt;sup&gt;5&lt;/sup&gt; Gender Issues in Lit, HUMAN 1300 Intro to Humanities, HUMAN 1320&lt;sup&gt;0&lt;/sup&gt; Holocaust &amp; Genocide Studies, HUMAN 1340&lt;sup&gt;0&lt;/sup&gt; MidEast Culture, HUMN 2350 Film &amp; American Culture, HUMN 2352 Holocaust Field Studies, MUSC 1320 Music in World Culture, MUSC 1340 History of Rock and Roll, MUSC 1350&lt;sup&gt;0&lt;/sup&gt; Experiencing Live Music, MUSC 1360 Class Voice, PHIL 1310 Intro to Philosophy, PHIL 1320&lt;sup&gt;0&lt;/sup&gt; Ethics, PHIL 1360&lt;sup&gt;0&lt;/sup&gt; World Religions, THTR 1310 Theater Appreciation, THTR 1360&lt;sup&gt;0&lt;/sup&gt; Acting for Everyone</td>
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<thead>
<tr>
<th>Emphasis Area</th>
<th>Area 7</th>
<th>Human Diversity (two courses, six credits required)</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>DVRS 1304&lt;sup&gt;4&lt;/sup&gt; Diversity &amp; Social Justice (REQUIRED)</td>
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<td></td>
<td>Choose one additional course: DVRS 2301 Race &amp; Ethnic Relations, ENGL 1340&lt;sup&gt;0&lt;/sup&gt; Intro to Multicultural Literature, ENGL 1345&lt;sup&gt;5&lt;/sup&gt; Gender Issues in Literature, GERO 1300 Intro to Gerontology, PSYC 1310&lt;sup&gt;0&lt;/sup&gt; Psychology of Women, WMST 1300&lt;sup&gt;0&lt;/sup&gt; Intro to Women’s Studies</td>
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<thead>
<tr>
<th>Emphasis Area</th>
<th>Area 8</th>
<th>Global Perspective (one course, three credits)</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>ANTH 1300&lt;sup&gt;0&lt;/sup&gt; Intro to Anthropology, ANTH 2300&lt;sup&gt;0&lt;/sup&gt; Anthropology of Science Fiction, ENGL 1342&lt;sup&gt;4&lt;/sup&gt; Middle Eastern Literature, GEOG 1300&lt;sup&gt;0&lt;/sup&gt; World Regional Geography, HASL 1408 Amer Sign Language III, HASL 1412 Amer Sign Language IV, HIST 1330&lt;sup&gt;0&lt;/sup&gt; World War II, HIST 1340&lt;sup&gt;0&lt;/sup&gt; Contemporary World History, HUMN 1340&lt;sup&gt;0&lt;/sup&gt; MidEast Culture, PHIL 1360&lt;sup&gt;0&lt;/sup&gt; World Religions, SPAN 1310 Beginning Spanish I, SPAN 1320 Beginning Spanish II</td>
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<table>
<thead>
<tr>
<th>Emphasis Area</th>
<th>Area 9</th>
<th>Ethical &amp; Civic Responsibility (one course, three credits)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>COMM 1330&lt;sup&gt;0&lt;/sup&gt; Media &amp; Social Issues, ECON 1310 Personal Finance, HIST 1310&lt;sup&gt;5&lt;/sup&gt; Am History until 1877, HIST 1311&lt;sup&gt;5&lt;/sup&gt; US Since 1877, HUMN 1320&lt;sup&gt;0&lt;/sup&gt; Holocaust &amp; Genocide Studies, PHIL 1320&lt;sup&gt;0&lt;/sup&gt; Ethics, POLS 1304&lt;sup&gt;0&lt;/sup&gt; Intro to American Politics, POLS 1320&lt;sup&gt;0&lt;/sup&gt; Public Issues, SOCI 1360&lt;sup&gt;0&lt;/sup&gt; Politics of Food</td>
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<table>
<thead>
<tr>
<th>Emphasis Area</th>
<th>Area 10</th>
<th>People &amp; the Environment (one course, three credits)</th>
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<tr>
<td></td>
<td></td>
<td>BLGY 1305&lt;sup&gt;0&lt;/sup&gt; Environmental Science, BLGY 1315&lt;sup&gt;5&lt;/sup&gt; Natural Resource Conservation, SOCI 2305&lt;sup&gt;0&lt;/sup&gt; Environmental Sociology</td>
</tr>
</tbody>
</table>
Auto Body Collision Technology

Auto Body Collision Technician AAS Degree  (72 Credits)

Program Description
The Automobile Body Collision Technology Program is designed to prepare graduates for employment as auto body technicians. Emphasis is on developing skills in straightening and restoring metal and fiberglass automobile bodies to original condition. Students will use industry-standard equipment on current model unibody vehicles. Instruction includes how to realign body-frame units and sheet metal, remove dents, replace panels and glass, diagnose collision damage and apply the latest two-stage and three-stage refinishing systems. Students learn how to repair high-tech plastics, repair and replace trim and brightwork, and restore corrosion protection.

The St. Cloud Technical and Community College’s Auto Body Collision Technology Program is ASE Certified, and graduates are prepared for the Auto Body Repair Excellence examinations. The program is certified by the National Automotive Technicians Education Foundation, Inc. (NATEF) and our instructors are certified by the Inter-Industry Conference on Auto Collision Repair (I-CAR).

Students selecting this program will find that they must master a considerable amount of theory, as well as manual skills.

Career Opportunities
The Automobile 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, industries, airlines, truck repair shops, wholesale suppliers, 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
ABCT1502 Collision Welding and Cutting .................................. 3
ABCT1506 Intro to Collision Repair ........................................... 4
ABCT1510 Collision Repair Lab I ............................................. 3
ABCT1514 Basic Collision Repair ............................................. 3
TRAN1518 Transportation Hazardous Materials ......................... 1

Suggested Technical Studies Semester II
ABCT1518 Refinishing Lab I .................................................. 3
ABCT1522 Refinishing ............................................................ 4
ABCT1526 Refinishing Lab II .................................................... 3
ABCT1530 Color Match and Blend .......................................... 3
TRAN2514 Basic Air Conditioning .......................................... 2

Suggested Technical Studies Semester III
ABCT2502 Estimating ............................................................ 2
ABCT2507 Electrical Systems .................................................. 2
ABCT2510 Damage Analysis and Measuring Systems ............... 3
ABCT2514 Plastic Repair ......................................................... 2
ABCT2518 Collision Repair Lab II ........................................... 1
ABCT2531 Mechanical Systems ............................................. 3

Suggested Technical Studies Semester IV
ABCT2522 Structural Damage Repair ........................................... 4
ABCT2527 Collision Repair Lab III ............................................ 4
ABCT2534 Collision Repair Lab IV OR
ABCT 2542 Supervised Internship ........................................... 4
TRAN1520 Workplace Perceptions and Expectations ............. 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: $3,400

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
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### Suggested Technical Studies Semester I

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ABCT1502</td>
<td>Collision Welding and Cutting</td>
<td>3</td>
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<tr>
<td>ABCT1506</td>
<td>Intro to Collision Repair</td>
<td>4</td>
</tr>
<tr>
<td>ABCT1510</td>
<td>Collision Repair Lab I</td>
<td>3</td>
</tr>
<tr>
<td>ABCT1514</td>
<td>Basic Collision Repair</td>
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</tr>
<tr>
<td>TRAN1518</td>
<td>Transportation Hazardous Materials</td>
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### Suggested Technical Studies Semester II

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<th>Course Code</th>
<th>Course Name</th>
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<tr>
<td>ABCT1518</td>
<td>Refinishing Lab I</td>
<td>3</td>
</tr>
<tr>
<td>ABCT1522</td>
<td>Refinishing</td>
<td>4</td>
</tr>
<tr>
<td>ABCT1526</td>
<td>Refinishing Lab II</td>
<td>3</td>
</tr>
<tr>
<td>ABCT1530</td>
<td>Color Match and Blend</td>
<td>3</td>
</tr>
<tr>
<td>TRAN2514</td>
<td>Basic Air Conditioning</td>
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### Suggested Technical Studies Semester III

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<tr>
<td>ABCT2507</td>
<td>Electrical Systems</td>
<td>2</td>
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<tr>
<td>ABCT2510</td>
<td>Damage Analysis and Measuring Systems</td>
<td>3</td>
</tr>
<tr>
<td>ABCT2514</td>
<td>Plastic Repair</td>
<td>2</td>
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<tr>
<td>ABCT2518</td>
<td>Collision Repair Lab II</td>
<td>3</td>
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<tr>
<td>ABCT2531</td>
<td>Mechanical Systems</td>
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### Suggested Technical Studies Semester IV

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<th>Course Name</th>
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<tr>
<td>ABCT2522</td>
<td>Structural Damage Repair</td>
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<tr>
<td>ABCT2527</td>
<td>Collision Repair Lab III</td>
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</tr>
<tr>
<td>ABCT2534</td>
<td>Collision Repair Lab IV OR</td>
<td>4</td>
</tr>
<tr>
<td>ABCT 2542</td>
<td>Supervised Internship</td>
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<tr>
<td>TRAN1520</td>
<td>Workplace Perceptions and Expectations</td>
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### Technical Electives *Choose 2 Credits*

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<th>Course Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>ABCT1538</td>
<td>Auto Restoration</td>
<td>2</td>
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<tr>
<td>ABCT1541</td>
<td>Advanced and Custom Refinishing</td>
<td>2</td>
</tr>
<tr>
<td>ABCT2502</td>
<td>Estimating</td>
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### General Studies

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<th>Course Name</th>
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<tr>
<td>ENGL1100</td>
<td>Writing for the Workplace</td>
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<td>GBEH1300</td>
<td>Human Relations</td>
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<td>General Studies Electives</td>
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</table>

Estimated cost of books, supplies and materials: $3,400

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**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

A nation on wheels demands skilled technicians to keep the wheels turning. St. Cloud Technical and Community College provides the education and training needed to meet this demand. Students receive instruction in the most current techniques of repair, diagnosis, maintenance, and our laboratories are equipped with the latest service and testing equipment. Graduates have the necessary educational background to obtain entry-level positions and progress to higher-level technical or management positions.

St. Cloud Technical and Community College’s Automotive Service Technician Program is ASE Certified and graduates are prepared for the Automotive Service Excellence examinations. The program is certified by the National Automotive Technicians Education Foundation, Inc. (NATEF). Students selecting this program will find they must master a considerable amount of theory as well as manual skills. The Transportation Studies Core also meets some of the requirements for graduation in the Medium/Heavy Truck Technician Program.

Career Opportunities

Trained technicians are offered a broad range of jobs from which to select their area of specialty. Examples include line technician, driveability specialist, front-end specialist, transmission specialist and parts specialist. Students with Associate of Applied Science Degrees have job opportunities such as service technicians, service advisors and shop managers. Graduates may transfer their degree to a 4 year college in order to attain a Bachelors Degree which would qualify them to obtain positions with the automotive manufacturers or the automotive aftermarket at a corporate level.

<table>
<thead>
<tr>
<th>Suggested Technical Studies Semester I</th>
<th>Technical Electives</th>
<th>General Education</th>
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<tbody>
<tr>
<td>AUTO1508 Automotive Wheel Alignment</td>
<td>Technical Electives</td>
<td>MNTC Goal 1 Communications</td>
</tr>
<tr>
<td>AUTO1509 A6: Automotive Electrical/Electronic Systems OR AUTO 1510 Chassis Electrical</td>
<td></td>
<td>MNTC Goal 2 Critical Thinking</td>
</tr>
<tr>
<td>TRAN1502 General Service</td>
<td></td>
<td>MNTC Goals 3 through 10</td>
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<tr>
<td>TRAN1504 Electricity and Electronic Principles</td>
<td></td>
<td></td>
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<tr>
<td>TRAN1516 Scan Tool Data Acquisition</td>
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<td></td>
</tr>
<tr>
<td>TRAN1518 Transportation Hazardous Materials</td>
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<thead>
<tr>
<th>Suggested Technical Studies Semester II</th>
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<tbody>
<tr>
<td>AUTO1512 Engine Repair Theory</td>
<td></td>
<td></td>
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<tr>
<td>AUTO1516 Brakes</td>
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<td>AUTO1523 Advanced Chassis Electrical</td>
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<tr>
<th>Suggested Technical Studies Semester III</th>
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<tbody>
<tr>
<td>AUTO1522 A8 Engine Performance OR AUTO2502 Engine Performance I</td>
<td></td>
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<tr>
<td>AUTO2505 Engine Performance II</td>
<td></td>
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<tr>
<td>AUTO2506 Principles of Torque Transfer</td>
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<tr>
<td>TRAN1520 Workplace Perceptions and Expectations</td>
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<tr>
<th>Suggested Technical Studies Semester IV</th>
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<tbody>
<tr>
<td>AUTO2511 Automatic Transmission and Transaxle Overhaul</td>
<td></td>
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<tr>
<td>AUTO2523 Advanced Electronic Systems</td>
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<tr>
<td>TRAN2514 Basic Air Conditioning</td>
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Technical Electives

Technical Electives .............................................. 9

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: $3,400

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Automotive Service Technician
Automotive Service Technician Diploma (67 Credits)

Program Description
A nation on wheels demands skilled technicians to keep the wheels turning. St. Cloud Technical and Community College provides the education and training needed to meet this demand. Students receive instruction in the most current techniques of repair, diagnosis, maintenance, and our laboratories are equipped with the latest service and testing equipment. Graduates have the necessary educational background to obtain entry-level positions and progress to higher-level technical or management positions. Students may choose between a diploma or an AAS Degree.

St. Cloud Technical and Community College’s Automotive Service Technician Program is ASE Certified and graduates are prepared for the Automotive Service Excellence examinations. The program is certified by the National Automotive Technicians Education Foundation, Inc. (NATEF). Students selecting this program will find they must master a considerable amount of theory as well as manual skills. The Transportation Studies Core also meets some of the requirements for graduation in the Medium/Heavy Truck Technician Program.

Career Opportunities
Trained technicians are offered a broad range of jobs from which to select their area of specialty. Examples include line technician, driveability specialist, front-end specialist, transmission specialist, service advisors, parts specialist and shop manager.

Suggested Technical Studies Semester I
AUTO1508 Automotive Wheel Alignment.............................. 4
AUTO1509 A6: Automotive Electrical/Electronic Systems OR
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
AUTO1522 A8 Engine Performance OR
AUTO2502 Engine Performance I........................................ 4
AUTO2505 Engine Performance II ...................................... 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 II.............................................. 3
AUTO2516 Automotive Heating and Air Conditioning ............ 2
AUTO2520 Engine Driveability ............................................ 3
AUTO2523 Advanced Electronic Systems ............................ 2
TRAN2514 Basic Air Conditioning ......................................... 2

General Studies
General Studies Electives .................................................. 7

Estimated cost of books, supplies and materials: $3,000

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

Program Description

The business world today is facing rapid changes, creating an increased demand for well-trained professionals to fill positions in many areas of the public, private and non-profit sectors. This degree builds a strong foundation in general business topics and gives students the ability to choose to concentrate electives in different business areas including accounting, finance and credit, and sales. Each business elective area focuses on developing students’ practical knowledge and provides opportunities to apply these skills in a variety of settings.

The Business Management degree at SCTCC is a flexible degree designed for students who want to continue their education and/or enter the workforce. The curriculum addresses contemporary business issues through courses in economics, communications, accounting, technology, marketing and management. Emphasis is placed on developing skills in decision-making, interpersonal communication skills, critical thinking, project management and problem solving. Students successfully completing the Business Management degree may choose to further advance their education by continuing to Bachelors Degree programs through articulation agreements with other colleges.

Students completing the Business Management degree have the opportunity to participate in Business Professionals of America (BPA) and Delta Epsilon (DEX). These student organizations further develop the project management, presentation, creativity, and leadership skills employers’ demand.

Career Opportunities

Students entering the work environment are employed by a variety of public and private organizations in sales, customer service, management, banking, collection, financial services, retail, wholesale, and service organizations, and private or public accounting.

Core Studies

ACCT1215 Accounting Principles I .................................................. 4
ACCT1216 Accounting Principles II ................................................. 4
CPTR1210 Introduction to Computers .............................................. 3
SAMG1200 Principles of Marketing ............................................... 3
SAMG1215 Principles of Management ......................................... 3

Technical Electives - Choose 12 Elective Credits from this list:

ACCT1217 Cost Accounting I ...................................................... 4
ACCT1218 Computerized Accounting I ....................................... 3
ACCT1219 Spreadsheets-Microsoft Excel .................................. 2
ACCT1220 Payroll Accounting .................................................. 2
ACCT2219 Computerized Accounting II .................................... 3
ACCT2226 Intermediate Accounting I ..................................... 4
ACCT2228 Cost Accounting II/Managerial Accounting ............ 4
ACCT2230 Income Tax I ............................................................ 4
ACCT2231 Income Tax II ............................................................ 2
BUSM1275 Business Law .......................................................... 2
FNCR1200 Personal Money Management ............................... 3
FNCR1220 Principles of Banking .............................................. 3
FNCR1250 Credit Law .............................................................. 3
FNCR2245 Consumer Lending ............................................... 3
FNCR2270 Collection Techniques ........................................... 3
SAMG1210 Customer Service/Sales Techniques ....................... 3
SAMG1220 Sales Promotion/Advertising ................................. 3
SAMG2245 Marketing Management ........................................ 3
SAMG2255 Applied Sales Strategies/Telemarketing .................. 3
SAMG2270 Human Resource Management .............................. 3
SAMG2276 Marketing Research ............................................. 3
SAMG2280 Sales Management ............................................... 3
SAMG2285 Entrepreneurship/Small Business Management ...... 3

General Education

ENGL1302 Analytical Writing .................................................. 4
ECON1330 Introduction to Microeconomics .............................. 3
ECON1320 Introduction to Macroeconomics .............................. 3
MATH1350 Introduction to Statistics ........................................ 3
MNTC Goal Area 1 Communications Oral ............................... 3
MNTC Goal Area 6 Humanities .............................................. 3
MNTC Goal Area 7 Diversity ................................................... 3
MNTC Goal Area 8 Global Perspectives .....................................
MNTC Goal Area 9 Ethical/Civic Responsibility ........................ 3
Gen Ed Elective ........................................................................ 3

Estimated cost of books, supplies and materials: $1,400

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

Cardiovascular Technology AAS Degree (71 Credits)

St. Cloud Technical & Community College

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 valvular function.

The Cardiovascular Technology Program is nationally accredited by the Commission on Accreditation of Allied Health Educational Programs (CAAHEP). The program coordinates academic study with the clinical experience. The applied clinical experience will be performed in a hospital setting and affiliate the student with one of the various cardiac catheterization laboratory facilities within the five state region.

Cardiovascular technologists assist the cardiologist in performing diagnostic, interventional, angioplasty and stent placement procedures; measure cardiovascular parameters such as cardiac output, cardiac electrophysiology parameters; intra-cardiac shunt detection, intra-cardiac pressure measurements, oximetry determination, and valve flow/valve area determination; record, analyze and process cardiovascular hemodynamic pressure measurements for presentation to the interpreting physician. Graduates demonstrate appropriate communication skills with patients and colleagues; act in a professional and ethical manner; provide patient education related to cardiovascular diagnostic and interventional techniques and promote good health.

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

Technical Studies Prerequisites

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>BLGY2310</td>
<td>Human Anatomy/Physiology I</td>
<td>4</td>
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<td>BLGY2320</td>
<td>Human Anatomy/Physiology II</td>
<td>4</td>
</tr>
<tr>
<td>MATH1300</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>PHYS1300</td>
<td>General Physics</td>
<td>4</td>
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* Current CPR, Healthcare Provider required

* Applicants may apply only after successful completion of 2 of the 4 courses listed in this requirement and all 4 courses must be completed prior to starting the program.

* 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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>HLTH1440</td>
<td>Medical Terminology</td>
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<tr>
<td>ICVT1422</td>
<td>Cardiovascular Instrumentation</td>
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</tr>
<tr>
<td>ICVT1440</td>
<td>Introduction to Clinics</td>
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Suggested Technical Studies Semester II

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<tr>
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<td>Infection Control</td>
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<tr>
<td>ICVT1402</td>
<td>Cardiovascular Anatomy and Physiology</td>
<td>4</td>
</tr>
<tr>
<td>ICVT1423</td>
<td>Catheterization Lab Fundamentals I</td>
<td>2</td>
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<tr>
<td>ICVT1443</td>
<td>Cardiovascular Clinic I</td>
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Suggested Technical Studies Semester III

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<tr>
<td>ICVT2405</td>
<td>Cardiovascular Pathology</td>
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<tr>
<td>ICVT2426</td>
<td>Catheterization Lab Fundamentals II</td>
<td>4</td>
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<td>ICVT2446</td>
<td>Cardiovascular Clinical II</td>
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Suggested Technical Studies Semester IV

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<tr>
<td>EMSP2460</td>
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<tr>
<td>ICVT2450</td>
<td>Applied Clinical Internship</td>
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Ethics

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<tr>
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<tr>
<td>Ethics</td>
<td>3</td>
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General Education

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<thead>
<tr>
<th>Title</th>
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<tbody>
<tr>
<td>MNTC Goal Area 1 Communications-Oral</td>
<td>3</td>
</tr>
<tr>
<td>MNTC Goal Area 1 Communications-Written</td>
<td>4</td>
</tr>
<tr>
<td>MNTC Goal Area 6 Humanities</td>
<td>3</td>
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</tbody>
</table>

Estimated cost of books, supplies and materials: $2,900

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

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. Department of Labor statistics indicate that the majority of supervisory people in building construction come from the carpentry trade.

A well-equipped shop is available for the development of student carpentry skills. Advanced students construct a home on a city lot. The building trades house project is a joint effort of the building trades classes. Local contractors, realtors, public officials, and financial managers serve as members of the Advisory Committee for this project.

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. Graduates may be employed as ceiling tile installers, drywall applicators, building inspectors, customer service representatives for building and hardware supply companies and lumber yard manager trainees, along with sales/service for any building materials supply. A number of graduates start their own contracting businesses.

Suggested Technical Studies Semester I

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CARP1506</td>
<td>Construction Tools, Equipment and Machines</td>
<td>3</td>
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<tr>
<td>CARP1514</td>
<td>Blueprint Reading and Estimating</td>
<td>3</td>
</tr>
<tr>
<td>CARP1521</td>
<td>Construction Principles</td>
<td>4</td>
</tr>
<tr>
<td>CARP1536</td>
<td>Cabinet Building and Estimating</td>
<td>5</td>
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Suggested Technical Studies Semester II

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<th>Course Title</th>
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<tr>
<td>CARP1524</td>
<td>Rafters and Stairs</td>
<td>4</td>
</tr>
<tr>
<td>CARP1527</td>
<td>Exterior/Interior Finish</td>
<td>3</td>
</tr>
<tr>
<td>CARP1529</td>
<td>Building Layout and Concrete</td>
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Suggested Technical Studies Semester III

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<tr>
<th>Course Code</th>
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<tr>
<td>CARP2502</td>
<td>Concrete II</td>
<td>2</td>
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<tr>
<td>CARP2506</td>
<td>Residential Framing II</td>
<td>4</td>
</tr>
<tr>
<td>CARP2518</td>
<td>Exterior Finish</td>
<td>3</td>
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<tr>
<td>CARP2524</td>
<td>Residential Construction Lab I</td>
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Suggested Technical Studies Semester IV

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<tr>
<td>CARP2510</td>
<td>Stair Building</td>
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<td>CARP2522</td>
<td>Interior Finish</td>
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<tr>
<td>CARP2530</td>
<td>Cabinet Building II</td>
<td>4</td>
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<tr>
<td>CARP2534</td>
<td>Construction Management</td>
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General Education

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<th>Course Code</th>
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<tbody>
<tr>
<td></td>
<td>MNTC Goal Area 1 Communications-Written</td>
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<td>MNTC Goal Area 1 Communications-Oral</td>
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<tr>
<td></td>
<td>MNTC Goal Area 3 or 4 Natural Science or Math</td>
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General Education Electives                                   | 10      |

Estimated cost of books, supplies and materials: $1,600

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

Carpentry Diploma (64 Credits)

Program Description

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. Department of Labor statistics indicate that the majority of supervisory people in building construction come from the carpentry trade.

A well-equipped shop is available for the development of student carpentry skills. Advanced students construct a home on a city lot. The building trades house project is a joint effort of the building trades classes. Local contractors, realtors, public officials, and financial managers serve as members of the Advisory Committee for this project.

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. Graduates may be employed as ceiling tile installers, drywall applicators, building inspectors, customer service representatives for building and hardware supply companies and lumber yard manager trainees, along with sales/service for any building materials supply. A number of graduates start their own contracting businesses.

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<tr>
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<tr>
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<td>CARP1514</td>
<td>Blueprint Reading and Estimating</td>
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<td>Construction Principles</td>
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<td>CARP1536</td>
<td>Cabinet Building and Estimating</td>
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Suggested Technical Studies Semester II

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<td>CARP1524</td>
<td>Rafters and Stairs</td>
<td>4</td>
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<td>Exterior/Interior Finish</td>
<td>3</td>
</tr>
<tr>
<td>CARP1529</td>
<td>Building Layout and Concrete</td>
<td>4</td>
</tr>
<tr>
<td>CARP1530</td>
<td>Residential Drafting and Design</td>
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Suggested Technical Studies Semester III

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<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CARP2502</td>
<td>Concrete II</td>
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<tr>
<td>CARP2506</td>
<td>Residential Framing II</td>
<td>4</td>
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<td>CARP2518</td>
<td>Exterior Finish</td>
<td>3</td>
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<tr>
<td>CARP2524</td>
<td>Residential Construction Lab I</td>
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Suggested Technical Studies Semester IV

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<tr>
<th>Course Code</th>
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<tr>
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<tr>
<td>CARP2522</td>
<td>Interior Finish</td>
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<tr>
<td>CARP2530</td>
<td>Cabinet Building II</td>
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</tr>
<tr>
<td>CARP2534</td>
<td>Construction Management</td>
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Technical Electives (choose one)

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<tr>
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<tr>
<td>CARP2546</td>
<td>Residential Construction Lab II</td>
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<tr>
<td>CARP2562</td>
<td>Carpentry Internship</td>
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General Studies

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<tr>
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<td>ENGL1100</td>
<td>Writing for the Workplace</td>
<td>3</td>
</tr>
<tr>
<td>GBEH1300</td>
<td>Human Relations</td>
<td>3</td>
</tr>
</tbody>
</table>

Estimated cost of books, supplies and materials: $1,500

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

Cabinet Maker’s Apprentice Certificate  (30 Credits)

Program Description
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Suggested Technical Studies Semester I
CARP1506  Construction Tools, Equipment and Machines........ 3
CARP1514  Blueprint Reading and Estimating....................... 3
CARP1521  Construction Principles.................................... 4
CARP1536  Cabinet Building and Estimating.......................... 5

Suggested Technical Studies Semester II
CARP2567  Cabinetmaking Internship................................... 9

General Studies
ENGL1100  Writing for the Workplace .................................. 3
GBEH1300  Human Relations ............................................... 3

Estimated cost of books, supplies and materials: $1,400

For further information, contact:
St. Cloud Technical & Technical College  1-800-222-1009
Admissions Office  (320) 308-5089
1540 Northway Drive  FAX: (320) 308-5981
St. Cloud, MN 56303-1240  TTY: (320) 308-5988
www.sctc.edu

St. Cloud Technical & Community College is accredited by The Higher Learning Commission of the North Central Association of Colleges and Schools.

Affirmative Action/Equal Opportunity Educator and Employer

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
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<tbody>
<tr>
<td>CARP1506</td>
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<td>3</td>
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<tr>
<td>CARP1514</td>
<td>Blueprint Reading and Estimating</td>
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<tr>
<td>CARP1521</td>
<td>Construction Principles</td>
<td>4</td>
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Suggested Technical Studies Semester II

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>CARP1524</td>
<td>Rafters and Stairs</td>
<td>4</td>
</tr>
<tr>
<td>CARP1527</td>
<td>Exterior/Interior Finish</td>
<td>3</td>
</tr>
<tr>
<td>CARP1529</td>
<td>Building Layout and Concrete</td>
<td>4</td>
</tr>
<tr>
<td>CARP2562</td>
<td>Carpentry Internship</td>
<td>3</td>
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</table>

General Studies

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EMSC1420</td>
<td>Basic Emergency Care</td>
<td>1</td>
</tr>
<tr>
<td>GBEH1300</td>
<td>Human Relations</td>
<td>3</td>
</tr>
</tbody>
</table>

Estimated cost of books, supplies and materials: $1,140

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
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. Included in coursework; students will engage in topics of technical mathematics, introductory computer skills, print interpretation, manufacturing processes, quality control, maintenance, and safety.

According to the Minnesota Department of Employment and Economic Development long-term occupation projections, the occupation, team assemblers, which would be the appropriate occupation for individuals with this certificate, will grow from 2006 to 2016 in the state of Minnesota. In addition high numbers of replacement workers will be needed for this occupation during that time. Advanced manufacturing continues to be considered a high demand/high growth/high pay industry for the state of Minnesota and this certificate provides marketable skills and knowledge to entry-level employees and a way for these individuals to distinguish themselves from colleagues and advance his/her career.

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CMAE2603</td>
<td>Technical Math</td>
<td>3</td>
</tr>
<tr>
<td>CMAE1506</td>
<td>Introduction to Computers</td>
<td>2</td>
</tr>
<tr>
<td>CMAE1510</td>
<td>Print Reading</td>
<td>2</td>
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<tr>
<td>CMAE1514</td>
<td>MSSC Safety</td>
<td>2</td>
</tr>
<tr>
<td>CMAE1518</td>
<td>MSSC Manufacturing Processes</td>
<td>2</td>
</tr>
<tr>
<td>CMAE1522</td>
<td>MSSC Quality</td>
<td>2</td>
</tr>
<tr>
<td>CMAE1526</td>
<td>MSSC Maintenance Awareness</td>
<td>2</td>
</tr>
</tbody>
</table>

Estimated cost of books, supplies and materials: $450

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
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. Included in coursework, students will engage in topics of technical mathematics, introductory computer skills, print interpretation, manufacturing processes, quality control, maintenance, and safety. Also included in coursework; students will engage in topics of 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.

According to the Minnesota Department of Employment and Economic Development long-term occupation projections, the occupation, Welders, Cutters, Solderers, and Brazers, which would be the appropriate occupation for individuals with this certificate, will increase from 2006 to 2016 in the state of Minnesota. In addition, the data shows a high number of replacement workers, (2,020), will be needed for this occupation between 2006 and 2016. Advanced manufacturing continues to be considered a high demand/high growth/high pay industry for the state of Minnesota and this certificate provides marketable skills and knowledge to entry-level employees and a way for these individuals to distinguish themselves from colleagues and advance his/her career.

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
CMAE2603 Technical Math ......................................................... 3
CMAE1506 Introduction to Computers ........................................... 2
CMAE1510 Print Reading .............................................................. 2
CMAE1514 MSSC Safety ............................................................. 2
CMAE1518 MSSC Manufacturing Processes .................................... 2
CMAE1522 MSSC Quality ................................................................. 2
CMAE1526 MSSC 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
Child and Adult Care & Education AAS Degree (65 Credits)

Program Description
The CACE Program prepares students for employment in a variety of educational and human service positions by providing courses in health and nutrition, gerontology, human development, professional and leadership skills, managing behavior, inclusive learning environments, curriculum planning, implementing strategies for learning, and practical experience. Students who successfully complete the program will have the qualifications to apply for a center-based assistant teacher position. After one year of experience, graduates qualify for a head teacher position. In addition, the completion of credit courses offers several options for fulfilling training and in-service requirements for assistant teacher, teachers, directors, paraprofessionals, family child care professionals, and other interested individuals. The program courses are in agreement with the Department of Human Service (DHS) licensing guidelines for child care providers. Membership in MnAEYC, NAEYC or other professional organizations is strongly recommended. Many of these courses can be used toward a birth through 3rd grade teaching license at some 4-year colleges or universities.

Applicants to the CACE Program must complete any college readiness courses with a passing grade, if indicated by their Accuplacer scores prior to enrolling in the CACE Program courses.

Before being placed on an Internship, students will be required to complete and submit a Department of Human Service (DHS) Background Study form; Pre-Entrance Medical Exam; and an Immunization Record.

Career Opportunities
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, and for students interested in starting their own business as child care providers. Graduates will be capable of planning learning activities, managing programs and daily routines, preparing materials, and managing the health and safety of children and/or vulnerable adults. Personal qualities desirable for the field include emotional maturity, physical stamina and the ability to work with people in a variety of settings, and acceptance of people with diverse backgrounds.

*S Note: First Aid & CPR for Child Care or equivalent required: Current CPR, Shaken Baby and Sudden Infant Death certification must be maintained throughout the program. This is a pre-requisite for CACE1460.

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 and Implementing Curriculum................. 3
CACE1460 Internship I...................................................... 3
EMSC1404 First Aid and CPR for Child Care Providers............ 1

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

Suggested Technical Studies Semester III
CACE1428 Family and Community Relations........................ 3
CACE1471 Motivational Professional and Leadership Dev........ 1

Suggested Technical Studies Semester IV
CACE1426 Children with Difficult Behaviors....................... 3
CACE1472 Professional and Leadership Citizenship Dev........... 1

Technical Electives
Technical Electives ..................................................... 6

General Education
MNCT Goal Area 1 Communications-Oral............................. 3
MNCT Goal Area 1 Communications-Written......................... 4
MNCT Goal Area 3 or 4 Natural Science OR Mathematics......... 3
MNCT Goal Area 5 Social Sciences.................................... 3
MNCT Goal Area 6 Humanities......................................... 3
General Education Electives............................................. 6

Estimated cost of books, supplies and materials: $1,300

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

Students completing the CACE AS Degree may choose to further their education by obtaining a Bachelor of Science (BS) Degree in Early Childhood Education from Southwest Minnesota State University, Marshall. Students will be able to attend classes at the St. Cloud Technical College while completing this degree leading to teaching licensure for ages Birth to Grade 3. There is also the opportunity to transfer to other universities.

The CACE AS Degree also prepares students for employment in a variety of human service positions by providing courses in health and nutrition, gerontology, human development, professional leadership skills, managing behavior, inclusive learning environments, curriculum planning, implementing strategies for learning, and practical experience. Students who successfully complete the program will have the qualifications to apply for a center-based assistant teacher position. After one year of experience, graduates qualify for a head teacher position. In addition, the completion of credit courses offers several options for fulfilling training and in-service requirements for individuals. The program courses are in agreement with the Department of Human Services (DHS) licensing guidelines for child care providers. Membership in MnAEYC, NAEYC or other professional organizations is strongly recommended. Many of these courses can be used toward a birth through 3rd grade teaching license at some 4 year colleges or universities.

Applicants to the CACE Program must complete any college readiness courses with a passing grade, if indicated by their ACCUPLACER scores prior to enrolling in the CACE Program courses.

Before being placed on an Internship, students will be required to complete and submit a Department of Human Services (DHS) Background Study Form; Pre-Entrance Medical Exam; and an Immunization Record.

Career Opportunities

Students may choose to continue their education by transferring to a teacher licensure program. Career opportunities for Child and Adult Care and Education AS Degree graduates may be found in early childhood centers, school settings, long-term care facilities, private homes, licensed family child care, facilities for people with disabilities, and for students interested in starting their own business as child care providers. Graduates will be capable of planning learning activities, managing programs and daily routines, preparing materials, and managing the health and safety of children and/or vulnerable adults. Personal qualities desirable for the field include emotional maturity, physical stamina and the ability to work with people in a variety of settings, and acceptance of people

* Note: First Aid & CPR for Child Care or equivalent required: Current CPR, Shaken Baby and Sudden Infant Death certification must be maintained throughout the program. This is a pre-requisite for CACE1460.

Suggested Technical Studies Semester I

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CACE1400</td>
<td>Professional Relations in CACE Careers</td>
<td>3</td>
</tr>
<tr>
<td>CACE1420</td>
<td>Foundations of Development</td>
<td>3</td>
</tr>
<tr>
<td>CACE1440</td>
<td>Guidance: Managing the Physical and Social Environment</td>
<td>3</td>
</tr>
<tr>
<td>CACE1444</td>
<td>Planning and Implementing Curriculum</td>
<td>3</td>
</tr>
<tr>
<td>CACE1460</td>
<td>Internship I</td>
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Suggested Technical Studies Semester II

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CACE1404</td>
<td>Safety, Health and Nutrition</td>
<td>3</td>
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<tr>
<td>CACE1422</td>
<td>Profiles of the Exceptional Child</td>
<td>3</td>
</tr>
<tr>
<td>CACE1424</td>
<td>School-Age Strategies for Learning</td>
<td>3</td>
</tr>
<tr>
<td>CACE1464</td>
<td>Internship II</td>
<td>3</td>
</tr>
<tr>
<td>CACE1470</td>
<td>Professional and Leadership Development</td>
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General Education

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CMST2300</td>
<td>Introduction to Public Speaking</td>
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<tr>
<td>ENGL1302</td>
<td>Analytical Writing</td>
<td>4</td>
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<tr>
<td>ENGL2302</td>
<td>Advanced Argument and Research Writing</td>
<td>3</td>
</tr>
<tr>
<td>MATH1330</td>
<td>Cultural Mathematics</td>
<td>3</td>
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<tr>
<td>SOCI1350</td>
<td>Sociology of Marriage and Family</td>
<td>3</td>
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<tr>
<td>MNTC Goal Area 6 Humanities and Fine Arts</td>
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<tr>
<td>MNTC Goal Area 9 Ethic and Civic Responsibility</td>
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<tr>
<td>Sociology</td>
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</table>

Estimated cost of books, supplies and materials: $1,300

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

The CACE Program prepares students for employment in a variety of educational and human service positions by providing courses in gerontology, health and nutrition, human development, managing behavior, inclusive learning environments, curriculum planning, implementing strategies for learning, and practical experience. Students who successfully complete the program will have the qualifications to apply for a center-based assistant teacher position. After one year of experience, graduates qualify for a head teacher position. In addition, the completion of credit courses offers several options for fulfilling training and in-service requirements for assistant teachers, teachers, director, paraprofessionals, family child care professionals and other interested individuals. The program courses are in agreement with the Department of Human Services (DHS) licensing guidelines for child care providers. Membership in MnAEYC, NAEYC or other professional organizations is strongly recommended. Many of these courses can be used toward a birth through 3rd grade teaching license at some 4 year colleges or universities.

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Career Opportunities

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* Note: First Aid & CPR for Child Care or equivalent required: Current CPR, Shaken Baby and Sudden Infant Death certification must be maintained throughout the program. This is a pre-requisite for CACE1460.

Suggested Technical Studies Semester I

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CACE1400</td>
<td>Professional Relations in CACE Careers</td>
<td>3</td>
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<tr>
<td>CACE1420</td>
<td>Foundations of Development</td>
<td>3</td>
</tr>
<tr>
<td>CACE1440</td>
<td>Guidance: Managing the Physical</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and Social Environment</td>
<td></td>
</tr>
<tr>
<td>CACE1444</td>
<td>Planning and Implementing Curriculum</td>
<td>3</td>
</tr>
<tr>
<td>CACE1460</td>
<td>Internship I</td>
<td>3</td>
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<tr>
<td>EMSC1404</td>
<td>First Aid and CPR for Child Care Providers</td>
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Suggested Technical Studies Semester II

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CACE1404</td>
<td>Safety, Health and Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>CACE1422</td>
<td>Profiles of the Exceptional Child</td>
<td>3</td>
</tr>
<tr>
<td>CACE1424</td>
<td>School-Age Strategies for Learning</td>
<td>3</td>
</tr>
<tr>
<td>CACE1464</td>
<td>Internship II</td>
<td>3</td>
</tr>
<tr>
<td>CACE1470</td>
<td>Professional and Leadership Development</td>
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General Studies

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<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGL1100</td>
<td>Writing for the Workplace</td>
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</tr>
<tr>
<td>DVRS1304</td>
<td>Diversity and Social Justice</td>
<td>3</td>
</tr>
</tbody>
</table>

Estimated cost of books, supplies and materials: $700

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 part of our daily lives. Students will receive extensive exposure to extremely current methodologies, languages, programming procedures, and to business data processing applications. Practical experience is provided on IBM PC compatibles using virtual machines. Programming students will design and write programs for E-commerce, operating systems and Mobile environments. Students will develop skills critical to the field in program testing, debugging, customization and network programming along with learning to follow instructions provided by systems documentation, review results and make necessary corrections. The program also emphasizes development of strong communication, problem solving and decision making skills and utilizes team-based learning in the classroom—all skills necessary to prepare students for the today’s work environment.

Students in the Computer Programmer major must achieve a 2.0 GPA or better in all Computer Programmer technical courses. All students in the Computer Programmer major are required to purchase a laptop computer for their coursework.

Career Opportunities
The use of stand-alone and networked computers is rapidly increasing in all levels of government and in business such as accounting firms, software houses, manufacturing firms, computer service centers, banks and hospitals. Employment potential is outstanding for competent Computer Programmer graduates.

<table>
<thead>
<tr>
<th>Suggested Technical Studies Semester I</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMSC1203 Structured Programming Logic .................................................. 3</td>
</tr>
<tr>
<td>CMSC1206 Basic Networking/ Security .................................................. 3</td>
</tr>
<tr>
<td>CMSC1212 Web Markup Language ...................... .................................. 3</td>
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<table>
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<tr>
<th>Suggested Technical Studies Semester II</th>
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<tbody>
<tr>
<td>CMSC1215 XML ............................................................... 3</td>
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<tr>
<td>CMSC1216 Database Modeling I ................. 3</td>
</tr>
<tr>
<td>CMSC1225 Java Language I ......................... 3</td>
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<tr>
<td>CMSC1227 Agile Programming Methodology .......... 3</td>
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<tr>
<td>CMSC1255 PHP .......................................................... 3</td>
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<table>
<thead>
<tr>
<th>Suggested Technical Studies Semester III</th>
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</thead>
<tbody>
<tr>
<td>CMSC2201 Database Modeling II ...................... 3</td>
</tr>
<tr>
<td>CMSC2202 Web Scripting Language .................. 3</td>
</tr>
<tr>
<td>CMSC2203 C# Programming .............................. 3</td>
</tr>
<tr>
<td>CMSC2204 Mobile Device Programming/Connectivity .. 3</td>
</tr>
<tr>
<td>CMSC2210 Visual Basic Programming ................ 3</td>
</tr>
<tr>
<td>CMSC2266 Java Language II ......................... 3</td>
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<table>
<thead>
<tr>
<th>Suggested Technical Studies Semester IV</th>
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<tbody>
<tr>
<td>BUSM1290 Job Seeking/Keeping Skills .................. 1</td>
</tr>
<tr>
<td>CMSC2205 Internship ........................................ 3</td>
</tr>
<tr>
<td>CMSC2220 Cryptography ................................. 3</td>
</tr>
<tr>
<td>CMSC2268 Network Programming ....................... 3</td>
</tr>
<tr>
<td>CMSC2279 Systems Analysis and Design ............... 3</td>
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</tbody>
</table>

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

Estimated cost of books, supplies and materials: $3,600

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. You will have many opportunities to participate in college and community events where you can gain practical experience in the field, including membership in the local Chef’s Society. Students with a passion for food, a sense of style and creativity, and organizational skills are encouraged to apply and explore this exciting program.

Career Opportunities
As a graduate of the program you will be licensed in Serv-Safe and may enjoy a career as a chef or cook in hotels, restaurants, resorts, catering, healthcare centers, and more!

Suggested Technical Studies Semester I
CULN1201 Kitchen Operations .................................................. 3
CULN1202 Introduction to Culinary Arts .................................... 3
CULN1220 Introduction to Pantry Food Preparation ................. 2
CULN1225 Servsafe Certification ............................................. 1
CULN1230 Vegetables, Potato, Rice and Farinaceous Products . 2
CULN1240 Stocks, Soups, Sauces ............................................ 3
CULN1260 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 Manager ..................................................... 4
CULN1280 Foodservice Internship .......................................... 2
CULN1290 Social Etiquette ................................................... 2

General Studies
GBEH1300 Human Relations .................................................. 3
EMSC 1420 Basic Emergency Care OR
HLTH 1460 Nutrition ........................................................... 1

Estimated cost of books, supplies and materials: $500

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Dental Assistant
Dental Assistant AAS Degree (68 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. This learning is accomplished through on-campus classroom, laboratory and clinical experience as well as an internship rotation in dental offices.

The Dental Assistant Program is accredited by the Commission on Dental Accreditation of the American Dental Association. Graduates will be eligible to write the Dental Assisting National Board Certification examination and the Minnesota Licensure examination.

Career Opportunities
The need for Dental Assistants is due to the success of preventive dentistry, increased awareness of the importance of regular dental care and cosmetic dentistry. Work 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. The AAS degree is designed to transfer some general education credits toward earning a dental hygiene degree and/or a related baccalaureate major.

### Technical Studies Prerequisites
<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMST1320 Introduction to Communication Studies</td>
<td>3</td>
</tr>
<tr>
<td>ENGL1302 Analytical Writing</td>
<td>4</td>
</tr>
</tbody>
</table>

* Current CPR, 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, an observation in a dental office setting.

### Suggested Technical Studies Semester I
<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>DENT1400 Dental Sciences</td>
<td>3</td>
</tr>
<tr>
<td>DENT1405 Introduction to Dental Assisting</td>
<td>2</td>
</tr>
<tr>
<td>DENT1409 Preclinical Dental Assisting</td>
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</tr>
<tr>
<td>DENT1412 Infection Control in the Dental Environment</td>
<td>3</td>
</tr>
<tr>
<td>HLTH1468 Essentials of Nutrition</td>
<td>2</td>
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### Suggested Technical Studies Semester II
<table>
<thead>
<tr>
<th>Course</th>
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</tr>
</thead>
<tbody>
<tr>
<td>DENT1424 Chairside Assisting I</td>
<td>2</td>
</tr>
<tr>
<td>DENT1434 Dental Materials I</td>
<td>2</td>
</tr>
<tr>
<td>DENT1440 Dental Radiology I</td>
<td>4</td>
</tr>
<tr>
<td>DENT1444 Expanded Functions I</td>
<td>4</td>
</tr>
</tbody>
</table>

### Suggested Technical Studies Semester III
<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>DENT1460 Internship I</td>
<td>1</td>
</tr>
<tr>
<td>DENT2406 Dental Health</td>
<td>1</td>
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<tr>
<td>DENT2424 Chairside Assisting II</td>
<td>4</td>
</tr>
<tr>
<td>DENT2440 Dental Materials II</td>
<td>2</td>
</tr>
<tr>
<td>DENT2446 Dental Radiology II</td>
<td>4</td>
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<tr>
<td>DENT2454 Expanded Functions II</td>
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### Suggested Technical Studies Semester IV
<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>DENT2412 Dental Practice Management</td>
<td>3</td>
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<tr>
<td>DENT2460 Internship II</td>
<td>6</td>
</tr>
<tr>
<td>DENT2485 Internship Seminar</td>
<td>2</td>
</tr>
<tr>
<td>DENT2488 Dental Ethics and Jurisprudence</td>
<td>1</td>
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### General Education
<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>MNTC Goal Area 3 Natural Science</td>
<td>4</td>
</tr>
<tr>
<td>MNTC Goal Area 6 or 7 Humanities or Diversity</td>
<td>3</td>
</tr>
<tr>
<td>Psychology</td>
<td>3</td>
</tr>
</tbody>
</table>

Estimated cost of books, supplies and materials: $3,500

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

Dental Assistant Diploma (59 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. This learning is accomplished through on-campus classroom, laboratory and clinical experience as well as an internship rotation in dental offices.

The Dental Assistant program is accredited by the Commission on Dental Accreditation of the American Dental Association. Graduates will be eligible to write the Dental Assisting National Board Certification examination and the Minnesota Licensure examination.

Career Opportunities

The need for Dental Assistants is due to the success of preventive dentistry, increased awareness of the importance of regular dental care and cosmetic dentistry. Work 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 Prerequisites

ENGL1100  Writing for the Workplace ........................................ 3
GBEH1300  Human Relations OR
       MNTC Goal Area 7 Diversity .................................................. 3

* Current CPR, 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, an observation in a dental office setting.

Suggested Technical Studies Semester I

DENT1400  Dental Sciences...................................................... 3
DENT1405  Introduction to Dental Assisting............................ 2
DENT1409  Preclinical Dental Assisting................................. 1
DENT1412  Infection Control in the Dental Environment......... 3
HLTH1460  Nutrition.......................................................... 1

Suggested Technical Studies Semester II

DENT1424  Chairside Assisting I........................................... 2
DENT1434  Dental Materials I............................................... 2
DENT1440  Dental Radiology I.............................................. 4
DENT1444  Expanded Functions I............................................ 4

Suggested Technical Studies Semester III

DENT1460  Internship I......................................................... 1
DENT2406  Dental Health...................................................... 1
DENT2424  Chairside Assisting II......................................... 4
DENT2440  Dental Materials II............................................. 2
DENT2446  Dental Radiology II............................................. 4
DENT2454  Expanded Functions II....................................... 4

Suggested Technical Studies Semester IV

DENT2412  Dental Practice Management.............................. 3
DENT2460  Internship II.......................................................... 6
DENT2485  Internship Seminar.............................................. 2
DENT2488  Dental Ethics and Jurisprudence............................. 1

General Education

Psychology.............................................................................. 3

Estimated cost of books, supplies and materials: $3,500

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

Dental Hygiene AAS Degree (84 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. The duties of a dental hygienist include patient assessments, taking radiographs, teeth cleaning and polishing, applying preventive agents, nonsurgical periodontal therapies (scaling and root planing), administering local anesthesia and nitrous oxide, taking impressions, pouring up study models and making bleaching trays.

The education program is a combination of classroom lectures, hands-on lab and clinical activities, along with numerous service learning opportunities. The program is demanding and quite rigorous in the scope and depth of study. Individuals who are strong in the biological sciences and human anatomy, have good dexterity, attention to detail and possess critical thinking skills are excellent candidates for a career in Dental Hygiene. 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. Dental Hygiene is a very competitive program. Fulfilling the prerequisites is not a guarantee to admission into the program. Students are ranked according to GPA in the prerequisite courses in consideration for admission to the program.

The Dental Hygiene program is accredited by the Commission on Dental Accreditation of the American Dental Association.

Career Opportunities

There is a strong demand for clinical dental hygienists throughout the USA. However, there are a limited number of full time employment opportunities in the St. Cloud area. 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.

<table>
<thead>
<tr>
<th>Technical Studies Prerequisites</th>
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</thead>
<tbody>
<tr>
<td>Human Anatomy/Physiology I</td>
<td>4</td>
</tr>
<tr>
<td>Human Anatomy/Physiology II</td>
<td>4</td>
</tr>
<tr>
<td>Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>Chemistry (for Health Science majors)</td>
<td>3</td>
</tr>
<tr>
<td>Essentials of Nutrition</td>
<td>2</td>
</tr>
</tbody>
</table>

* Applicant may apply only after successful completion of 3 of the 5 science/nutrition courses listed above. Priority will be given to those students who have completed all 5 of the science/nutrition courses listed above at an accredited college or university and to those students who have completed the largest portion of the general education component.

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

<table>
<thead>
<tr>
<th>Suggested Technical Studies Semester I</th>
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</tr>
</thead>
<tbody>
<tr>
<td>DEHY1400 Dental Hygiene Seminar I</td>
<td>2</td>
</tr>
<tr>
<td>DEHY1418 Introduction to Radiology</td>
<td>2</td>
</tr>
<tr>
<td>DEHY1424 Orofacial Structures</td>
<td>3</td>
</tr>
<tr>
<td>DEHY1426 Oral Histology/Embryology</td>
<td>1</td>
</tr>
<tr>
<td>DEHY1428 General and Oral Pathology</td>
<td>3</td>
</tr>
<tr>
<td>DEHY1480 DH- Pre-Clinical Lab I</td>
<td>3</td>
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<table>
<thead>
<tr>
<th>Suggested Technical Studies Semester II</th>
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</thead>
<tbody>
<tr>
<td>DEHY1402 Dental Hygiene Seminar II</td>
<td>2</td>
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<tr>
<td>DEHY1410 Introduction to Dental Materials and Methods</td>
<td>2</td>
</tr>
<tr>
<td>DEHY1422 Dental Pharmacology</td>
<td>2</td>
</tr>
<tr>
<td>DEHY1448 Dental Hygiene Radiology II</td>
<td>2</td>
</tr>
<tr>
<td>DEHY1460 Periodontics</td>
<td>2</td>
</tr>
<tr>
<td>DEHY1482 DH Pre Clinical/Clinical Lab II</td>
<td>2</td>
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<tr>
<td>DEHY1484 Clinical Dental Hygiene II</td>
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<table>
<thead>
<tr>
<th>Suggested Technical Studies Semester III</th>
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</thead>
<tbody>
<tr>
<td>DEHY1404 Clinical Seminar III</td>
<td>2</td>
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<tr>
<td>DEHY1420 Dental Hygiene Materials and Methods</td>
<td>2</td>
</tr>
<tr>
<td>DEHY1440 Community Dental Health I</td>
<td>2</td>
</tr>
<tr>
<td>DEHY1468 Pain Management</td>
<td>2</td>
</tr>
<tr>
<td>DEHY1486 Clinical Dental Hygiene III</td>
<td>6</td>
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<table>
<thead>
<tr>
<th>Suggested Technical Studies Semester IV</th>
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</thead>
<tbody>
<tr>
<td>DEHY1406 Clinical Seminar IV</td>
<td>2</td>
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<tr>
<td>DEHY1444 Community Dental Health II</td>
<td>2</td>
</tr>
<tr>
<td>DEHY1464 Advanced Periodontics</td>
<td>1</td>
</tr>
<tr>
<td>DEHY1488 Clinical Dental Hygiene IV</td>
<td>6</td>
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</table>

<table>
<thead>
<tr>
<th>Ethics</th>
<th></th>
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<tbody>
<tr>
<td>HLTH1484 Ethics for Health Careers</td>
<td>3</td>
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<table>
<thead>
<tr>
<th>General Education</th>
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<tbody>
<tr>
<td>MNTC Goal Area 1 Communications-Oral</td>
<td>3</td>
</tr>
<tr>
<td>MNTC Goal Area 1 Communications-Written</td>
<td>3</td>
</tr>
<tr>
<td>Psychology</td>
<td>3</td>
</tr>
<tr>
<td>Sociology</td>
<td>3</td>
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</tbody>
</table>

Estimated cost of books, supplies and materials: $7,000

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
**Electrical Construction Technology**  
*Electrical Construction Technology AAS Degree (79 Credits)*

## Program Description

The Electrical Construction Technology 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. Related subjects are scheduled throughout the program. A good mathematics background with one year of high school algebra or trigonometry is required.

Students will learn to apply knowledge to actual projects in the shop or mock-ups. Students will wire the house project, built as a student project by our building trades classes.

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).

The Electrical Construction Technology Program is approved by Minnesota State Board of Electricity. Credit is given toward the state electrical license upon completion of this two year course.

Students are required to have completed ACCUPLACER with a minimum math score of 44 and a minimum reading score of 78. If ACCUPLACER scores indicate pre-college course work this must be done prior to starting the program.

## 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 electrical trade today is an ever-expanding industry that offers a wide variety of interesting work. 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC1502</td>
<td>Basic Wiring and Materials I</td>
<td>5</td>
</tr>
<tr>
<td>ELEC1510</td>
<td>National Electrical Code I</td>
<td>2</td>
</tr>
<tr>
<td>ELEC1518</td>
<td>Applied Electrical Principles and Formulas</td>
<td>5</td>
</tr>
<tr>
<td>ELEC1522</td>
<td>Drafting Blueprint Reading and Specification</td>
<td>3</td>
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</table>

### Suggested Technical Studies Semester II

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ELEC1506</td>
<td>Basic Wiring and Materials II</td>
<td>5</td>
</tr>
<tr>
<td>ELEC1514</td>
<td>National Electrical Code II</td>
<td>2</td>
</tr>
<tr>
<td>ELEC1526</td>
<td>Applied Electrical Principles and A. C. Fund</td>
<td>5</td>
</tr>
<tr>
<td>ELEC1530</td>
<td>Electric Heat</td>
<td>2</td>
</tr>
<tr>
<td>ELEC1534</td>
<td>Safety, Certifications and Skills</td>
<td>3</td>
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### Suggested Technical Studies Semester III

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ELEC1538</td>
<td>Industry Skills Development</td>
<td>1</td>
</tr>
<tr>
<td>ELEC2502</td>
<td>Residential Wiring I</td>
<td>2</td>
</tr>
<tr>
<td>ELEC2510</td>
<td>National Electrical Code III</td>
<td>2</td>
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<tr>
<td>ELEC2519</td>
<td>Commercial Wiring</td>
<td>3</td>
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<tr>
<td>ELEC2520</td>
<td>Commercial Lighting</td>
<td>2</td>
</tr>
<tr>
<td>ELEC2522</td>
<td>AC Motor Control I</td>
<td>3</td>
</tr>
<tr>
<td>ELEC2538</td>
<td>Transformers, Three Phase Systems, and Formulas</td>
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### Suggested Technical Studies Semester IV

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ELEC2506</td>
<td>Residential Wiring II</td>
<td>2</td>
</tr>
<tr>
<td>ELEC2514</td>
<td>National Electrical Code IV</td>
<td>2</td>
</tr>
<tr>
<td>ELEC2526</td>
<td>A. C. Motor Control II</td>
<td>4</td>
</tr>
<tr>
<td>ELEC2532</td>
<td>Solid State and PLC Controls</td>
<td>3</td>
</tr>
<tr>
<td>ELEC2534</td>
<td>Industrial Systems</td>
<td>3</td>
</tr>
<tr>
<td>ELEC2540</td>
<td>Low Voltage Systems</td>
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<tr>
<td>EMSC1420</td>
<td>Basic Emergency Care</td>
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### General Education

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

Estimated cost of books, supplies and materials: $1,800

**PLEASE NOTE:** All program plans are preliminary and curriculum may change without notice.
Electrical Construction Technology

Electrical Construction Technology Diploma (70 Credits)

Program Description

The Electrical Construction Technology 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. Related subjects are scheduled throughout the program. A good mathematics background in algebra and geometry is beneficial.

Students will learn to apply knowledge to actual projects in the shop or mock-ups. Students will wire the house project, built as a student project by our building trades classes.

Advanced students will receive training in A.C. and D.C. motor and generator theory, transformers, lighting, three phase systems, motor control, basic electronics, solid state, and programmable logic controls (PLC).

The Electrical Construction Technology Program is approved by Minnesota State Board of Electricity. Credit is given toward the state electrical license upon completion of this two year course.

Students are required to have completed ACCUPLACER with a minimum math score of 44 and a minimum reading score of 62. If ACCUPLACER scores indicate pre-college course work this must be done prior to starting the program.

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 electrical trade today is an ever-expanding industry that offers a wide variety of interesting work. 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.

<table>
<thead>
<tr>
<th>Suggested Technical Studies Semester I</th>
<th>Suggested Technical Studies Semester IV</th>
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<tbody>
<tr>
<td>ELEC1502 Basic Wiring and Materials I ........................................ 5</td>
<td>ELEC2506 Residential Wiring II ........................................ 2</td>
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<tr>
<td>ELEC1510 National Electrical Code I .................................................. 2</td>
<td>ELEC2514 National Electrical Code IV ........................................ 2</td>
</tr>
<tr>
<td>ELEC1518 Applied Electrical Principles and Formulas .................................. 5</td>
<td>ELEC2526 A.C. Motor Control II ............................................... 4</td>
</tr>
<tr>
<td>ELEC1522 Drafting Blueprint Reading and Specification .................................... 3</td>
<td>ELEC2532 Solid State and PLC Controls ......................................... 3</td>
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<table>
<thead>
<tr>
<th>Suggested Technical Studies Semester II</th>
<th>Suggested Technical Studies Semester III</th>
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<tbody>
<tr>
<td>ELEC1506 Basic Wiring and Materials II ........................................ 5</td>
<td>ELEC2508 Residential Wiring II ........................................ 2</td>
</tr>
<tr>
<td>ELEC1511 National Electrical Code II .................................................. 2</td>
<td>ELEC2511 National Electrical Code IV ........................................ 2</td>
</tr>
<tr>
<td>ELEC1528 Applied Electrical Principles and A.C. Fund .................................. 5</td>
<td>ELEC2528 A.C. Motor Control II ............................................... 4</td>
</tr>
<tr>
<td>ELEC1530 Electric Heat ................................................................. 2</td>
<td>ELEC2533 Industrial Systems .................................................... 3</td>
</tr>
<tr>
<td>ELEC1534 Safety, Certifications and Skills ................................................ 3</td>
<td>ELEC2540 Low Voltage Systems .................................................... 3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Suggested Technical Studies Semester III</th>
<th>Suggested Technical Studies Semester IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC1538 Industry Skills Development .................................................. 1</td>
<td>ELEC2508 Residential Wiring II ........................................ 2</td>
</tr>
<tr>
<td>ELEC2502 Residential Wiring I ............................................................ 2</td>
<td>ELEC2511 National Electrical Code IV ........................................ 2</td>
</tr>
<tr>
<td>ELEC2510 National Electrical Code III .................................................... 2</td>
<td>ELEC2528 A.C. Motor Control II ............................................... 4</td>
</tr>
<tr>
<td>ELEC2515 Commercial Wiring ............................................................... 3</td>
<td>ELEC2533 Industrial Systems .................................................... 3</td>
</tr>
<tr>
<td>ELEC2520 Commercial Lighting .............................................................. 2</td>
<td>ELEC2540 Low Voltage Systems .................................................... 1</td>
</tr>
<tr>
<td>ELEC2522 AC Motor Control I ............................................................... 3</td>
<td>GBEH1300 Human Relations OR DVRS 1304 ........................................ 3</td>
</tr>
<tr>
<td>ELEC2538 Transformers, Three Phase Systems, and Formulas ............................ 3</td>
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General Studies

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>EMSC1420</td>
<td>Basic Emergency Care</td>
</tr>
<tr>
<td>ENGL1100</td>
<td>Writing for the Workplace OR ENGL 1302</td>
</tr>
<tr>
<td>GBEH1300</td>
<td>Human Relations OR DVRS 1304</td>
</tr>
</tbody>
</table>

Estimated cost of books, supplies and materials: $1,720

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

Electronics Technician I - Certificate (30 Credits-pending)

Program Description
The Electronics Technician I 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 AC/DC Fundamentals I ............................................ 3
ETEC1512 AC/DC Fundamentals II ........................................... 3
ETEC1515 Industrial Safety ...................................................... 2
TECH1500 Applied Algebra ..................................................... 3
TECH1530 Computer Applications ........................................... 2
TECH1550 Basic CADD ......................................................... 2

Suggested Technical Studies Semester II
CADD1522 Applied Physics .................................................... 4
ETEC1507 Digital Electronics ................................................. 3
ETEC1521 Analog Circuits ....................................................... 3
ETEC1541 Mechanical Systems ............................................... 3
TECH1556 Basic Manual - Automated Machining ...................... 2

Estimated cost of books, supplies and materials: $1,200

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 a 35 credit core curriculum providing a strong base in electrical, electronic and mechanical systems. Students will select an area of specialization to complete their program of study from the following: Wind Energy, Ethanol, Biodiesel, Fossil Fuels, or Power Generation. Students will be preparing for employment in one or more of the growing energy industry sectors.

The Energy Technical Specialist degree is offered through nine colleges in the Minnesota State Colleges and Universities system and is funded in part by a High Growth Job Training Initiative grant from the U. S. Department of Labor. Through this partnership, students will have opportunities to take some courses in on-line and blended formats from partner institutions.

Career Opportunities

With Minnesota as a leader in renewable energy development, the opportunities in the state are even greater than many other states. Projections show extensive growth in new energy production methods, greening of traditional energy production, and growing focus on energy efficiency. Current industry employment opportunities will grow significantly with projected retirements exceeding 50% of the current workforce over the coming years resulting from baby-boomer retirements. The Energy Technical specialist AAS program trains students to work in this growing field.

Suggested Technical Sem I

RNEW1300 Introduction to Renewable Energy ................. 3
ETEC1511 AC/DC Fundamentals I .................................. 3
ETEC1512 AC/DC Fundamentals II ................................ 3
ETEC1515 Industrial Safety ........................................... 2

Suggested Technical Studies Semester II

ETEC1507 Digital Electronics ......................................... 3
ETEC1523 Print Reading ............................................... 3
ETEC1531 Instrumentation I ........................................... 3
ETEC1541 Mechanical Systems ....................................... 3

Suggested Technical Studies Semester III

ETEC2512 Hydraulics .................................................. 3
ETEC2513 Pneumatics .................................................. 3
ETEC2516 Mechanical Systems II .................................. 4
TECH1552 Basic Metal Joining and Fabrication .............. 2

Suggested Technical Studies Semester IV

ETEC2543 Programmable Logic Control ...................... 3
ETEC2546 Powerplant Technology ................................ 4
ETEC2547 Mechanical Fundamentals for Process Control ... 3

Technical Electives

Selected to meet an area of specialization if other than fossil fuels
.................................................................................. 10

General Education

MNTC Goal 1 Communications-Written ....................... 3
MNTC Goal 3 Physics or Chemistry ............................. 3
MNTC Goal 3 Environmental Science ......................... 3
MNTC Goal 4 Mathematics ........................................... 3
Gen Ed Elective ............................................................. 3

SCTCC Recommended General Education Courses

ENGL 1302 Analytical Writing ...................................... 4
MATH 1300 College Algebra ........................................ 3
PHYS 1300 Physics ..................................................... 4
BLGY 1305 Environmental Science ............................ 4

Estimated cost of books, supplies and materials: $2650

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
# Energy And Electronics

**Industrial Electronics Technician AAS Degree (64 Credits)**

## Program Description

The Electronics 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 microcontrollers, and telecommunications 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, scientific methods, and problem solving skills.

Individuals are also able to select elective credits from a variety of other knowledge and skill areas such as 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.

## Career Opportunities

Graduates from this program find exciting opportunities as instrument and process control technicians in installing, maintaining, and repairing 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

<table>
<thead>
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<tr>
<td>TECH1556</td>
<td>Basic Manual - Automated Machining</td>
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## Suggested Technical Studies Semester IV

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<td>ETEC2545</td>
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## Technical Electives

Technical Electives ........................................ 4

## General Education

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<td>CMST1320</td>
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<td>MNTC Goal Area 5</td>
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Estimated cost of books, supplies and materials: $2,650

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

Industrial Electronics Technician Diploma (60 Credits)

Program Description

The Electronics Program prepares individuals to apply electronic engineering principles and technical skills in the fields of instrumentation and industrial control systems, digital and analog circuits, and analog circuits, automated manufacturing and robotics, manufacturing and facilities maintenance, embedded microcontrollers, and telecommunications 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, scientific methods, and problem solving skills.

Individuals are also able to select elective credits from a variety of other knowledge and skill areas such as 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.

Career Opportunities

Graduates from this program find exciting opportunities as electro-mechanical technicians in installing, maintaining, and repairing electronic equipment and systems 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

<table>
<thead>
<tr>
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<tr>
<td>ETEC1512</td>
<td>AC/DC Fundamentals II</td>
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<td>ETEC1515</td>
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<tr>
<td>TECH1500</td>
<td>Applied Algebra</td>
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<td>TECH1530</td>
<td>Computer Applications</td>
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Suggested Technical Studies Semester II

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<td>ETEC1521</td>
<td>Analog Circuits</td>
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<td>ETEC1541</td>
<td>Mechanical Systems</td>
<td>3</td>
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<td>TECH1556</td>
<td>Basic Manual - Automated Machining</td>
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Suggested Technical Studies Semester III

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<td>ETEC2513</td>
<td>Pneumatics</td>
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<td>ETEC2541</td>
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Suggested Technical Studies Semester IV

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<td>Programmable Logic Control</td>
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<td>ETEC2544</td>
<td>Automated Manufacturing Systems</td>
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General Studies

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<tr>
<td>GBEH1300</td>
<td>Human Relations</td>
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<td>ENGL1100</td>
<td>Writing for the Workplace</td>
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</table>

Estimated cost of books, supplies and materials: $2,650

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Energy And Electronics  
Instrumentation and Process Control AAS Degree  (64 Credits)

St. Cloud Technical & Community College

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 microcontrollers, 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.

Career Opportunities
Graduates from this program find exciting opportunities as electro-mechanical technicians in installing, maintaining, and repairing electronic equipment and systems 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 AC/DC Fundamentals I ........................................ 3
ETEC1512 AC/DC Fundamentals II ...................................... 3
ETEC1515 Industrial Safety .............................................. 2
TECH1530 Computer Applications ..................................... 2
TECH1550 Basic CADD ...................................................... 2

Suggested Technical Studies Semester II
ETEC1507 Digital Electronics .............................................. 3
ETEC1521 Analog Circuits ................................................. 3
ETEC1541 Mechanical Systems ........................................... 3
TECH1556 Basic Manual - Automated Machining .................. 2

Suggested Technical Studies Semester III
ETEC2512 Hydraulics ....................................................... 3
ETEC2513 Pneumatics ....................................................... 3
ETEC2541 Electric Motor Control I ...................................... 3

Suggested Technical Studies Semester IV
ETEC2542 Electric Motor Control II .................................... 3
ETEC2543 Programmable Logic Control ................................ 3
ETEC2544 Automated Manufacturing Systems ...................... 3
ETEC2545 Networking Systems .......................................... 2

Technical Electives
Technical Electives .......................................................... 4

General Education
PHYS1300 General Physics .............................................. 4
ENGL1302 Analytical Writing ........................................... 4
CMST1320 Introduction to Communication Studies ............... 3
MATH1300 College Algebra ............................................. 3
MNTC Goal Area 5 Social Sciences .................................... 3

Estimated cost of books, supplies and materials: $2,650

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Energy And Electronics
Instrumentation and Process Control Diploma (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 microcontrollers, 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.

**Career Opportunities**
Graduates from this program find exciting opportunities as electro-mechanical technicians in installing, maintaining, and repairing electronic equipment and systems 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**

<table>
<thead>
<tr>
<th>Semester I</th>
<th>ETEC1511 AC/DC Fundamentals I</th>
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<tr>
<td></td>
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<td>ETEC1515 Industrial Safety</td>
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<tr>
<td></td>
<td>TECH1500 Applied Algebra</td>
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<td></td>
<td>TECH1530 Computer Applications</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>TECH1550 Basic CADD</td>
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| Semester II       | CADD1522 Applied Physics       | 4 |
|-------------------| ETEC1507 Digital Electronics  | 3 |
|                   | ETEC1521 Analog Circuits       | 3 |
|                   | ETEC1531 Instrumentation I     | 3 |
|                   | TECH1556 Basic Manual - Automated Machining | 2 |

| Semester III      | ETEC2512 Hydraulics            | 3 |
|-------------------| ETEC2513 Pneumatics           | 3 |
|                   | ETEC2541 Electric Motor Control I | 3 |
|                   | TECH1552 Basic Metal Joining and Fabrication | 2 |

| Semester IV       | CADD2529 Manufacturing Systems | 2 |
|-------------------| ETEC2531 Instrumentation II   | 3 |
|                   | ETEC2542 Electric Motor Control II | 3 |
|                   | ETEC2543 Programmable Logic Control | 3 |
|                   | ETEC2545 Networking Systems   | 2 |

**General Studies**

|                  | GBEH1300 Human Relations       | 3 |
|-------------------| ENGL1100 Writing for the Workplace | 3 |

Estimated cost of books, supplies and materials: $2,650

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
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 are taught a system of a farm business recordkeeping 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.

A three-year post-diploma program is available to those who complete the six-year Farm Business Management Program. Information may be obtained by visiting or writing to the Farm Business Management Program, St. Cloud Technical and Community College, 1540 Northway Drive, St. Cloud, Minnesota 56303. The telephone numbers are (320) 308-5033 or 308-5925.

DIPLOMA Technical Courses

Year 1
- FBMT1112 Foundations for Farm Business Management .......... 4
- FBMT1211 Introduction to 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 Financial Instruments in Farm System Management 2

Year 5
- FBMT2151 Strategies in Farm System Data Management ....... 4
- FBMT2152 System Information for Financial Planning .......... 4
- FBMT2253 System Plans and Projections ......................... 2

Year 6
- FBMT2161 Examination of Farm System Management .......... 4
- FBMT2162 Refining Farm System Management .................. 4
- FBMT2263 Evaluating Farm System Programs .................... 2

Advanced Certificate Technical Courses - Core Required
- FBMT2930 Fund of Fin Mgmt........................................ 3
- FBMT2931 Applied Financial Mgmt................................ 3
- FBMT2932 Fund of Fin Mgmt/Strategic Planning ................. 3
- FBMT2933 Applied Fin Mgmt/Strategic Planning ................. 3
- FBMT2934 Fund of Fin Mgmt/Business Plan .................... 3
- FBMT2935 Applications in Fin Mgmt/Business Plans ............ 3

Advanced Certificate Technical Courses - Electives
- FBMT2950 Farm Management Decision Making .................. 2
- FBMT2951 Farm Management Communications .................. 2
- FBMT2952 Modern Agricultural Technology .................... 2
- FBMT2953 Farm Business and/or Family Transition ............ 2
- FBMT2954 Farm Management Personnel Mgmt .................. 2
- FBMT2955 Farm Management Enterprise Alternatives ........ 2

Estimated cost of books, supplies and materials: $25

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 includes course material designed to prepare students interested in pursuing 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, sales and collections.

By effectively using the material and activities offered in this program, students can develop their abilities to secure promising positions in this dynamic field.

Students may be eligible for individual scholarships in the program.

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
BUSM1275 Business Law ....................................................... 2
CPTR1210 Introduction to Computers ..................................... 3
FNCR1200 Personal Money Management .............................. 3
FNCR1220 Principles of Banking ............................................. 3

Suggested Technical Studies Semester II
ACCT1216 Accounting Principles II ....................................... 4
ACCT1219 Spreadsheets-Microsoft Excel ............................... 2
SAMG1210 Customer Service/Sales Techniques ...................... 3

Suggested Technical Studies Semester III
FNCR2270 Collection Techniques ........................................... 3
SAMG1215 Principles of Management .................................... 3
SAMG2255 Applied Sales Strategies/Telemarketing ................... 3

Suggested Technical Studies Semester IV
FNCR1250 Credit Law .......................................................... 3
FNCR2245 Consumer Lending ................................................. 3
FNCR2275 Internship ............................................................ 3

General Education
MNTC Goal Area 1 Communications-Oral ............................... 3
MNTC Goal Area 1 Communications-Written ............................ 4
MNTC Goal Area 2 Critical Thinking ....................................... 3
MNTC Goal Area 4 Mathematics and Logic ............................... 3
ECON1310 Personal Finance .................................................. 3

Estimated cost of books, supplies and materials: $1,000

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
# Finance And Credit

*Finance And Credit Diploma (53 Credits)*

## Program Description

The Finance and Credit Program includes course material designed to prepare students interested in pursuing 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, sales and collections.

By effectively using the material and activities offered in this program, students can develop their abilities to secure promising positions in this dynamic field.

Students may be eligible for individual scholarships in the program.

## 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.

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<td>BUSM1275</td>
<td>Business Law</td>
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<tr>
<td>CPTR1210</td>
<td>Introduction to Computers</td>
<td>3</td>
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<td>FNCR1220</td>
<td>Principles of Banking</td>
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## Suggested Technical Studies Semester II

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<td>FNCR1200</td>
<td>Personal Money Management</td>
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<tr>
<td>SAMG1210</td>
<td>Customer Service/Sales Techniques</td>
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## Suggested Technical Studies Semester III

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<tr>
<td>SAMG1215</td>
<td>Principles of Management</td>
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<tr>
<td>SAMG2255</td>
<td>Applied Sales Strategies/Telemarketing</td>
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## Suggested Technical Studies Semester IV

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## General Studies

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<tr>
<td>GBEH1300</td>
<td>Human Relations</td>
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Estimated cost of books, supplies and materials: $1,000

**PLEASE NOTE:** All program plans are preliminary and curriculum may change without notice.
Health Information Technology

Health Information Technology AAS Degree  (63 Credits)

Program Description

Health information management combines the disciplines of medicine, information management, and computer technology within the healthcare industry. The HIT program curriculum includes general education requirements as well as courses in computer applications, biological sciences, medicine, health information collection, processing, retrieval, evaluation, dissemination and management. The provision for technical and managerial experiences is an important aspect of the curriculum.

The curriculum also includes an educational clinical internship. Within the second semester of the program, students will be required to successfully complete the State of Minnesota Background Study. The results of the Background Study must indicate the student is in good standing to be considered for internship opportunities. During the internship experience, the student reports to a healthcare facility and experiences planned activities in the environment of the actual workplace. 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.

Students who have earned a grade of “C” or better, in all program classes, as well as an overall GPA of 2.5 or better will have satisfied the program requirements for the AAS degree.

Program Accreditation Status: The Health Information Technology program is accredited by the Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM). Upon completion of the HIT program, graduates should be prepared to demonstrate entry-level competencies for Registered Health Information Technicians (RHITs) as identified by the profession.

Career Opportunities

Health Information Technology graduates successfully complete internships in clinics, hospitals, insurance offices, medical testing facilities, long-term care facilities, and industrial medical facilities. Many of these internship sites transfer into full-time jobs.

All students are required to purchase a program-specific laptop.

Technical Studies Prerequisites

* 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 5 or fewer errors on a 2 minute timing. Students must show proof with a high school transcript, Tech Prep 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ADMS1202</td>
<td>Keyboarding/Word Processing</td>
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<tr>
<td>HITM1225</td>
<td>Introduction to Health Information Technology</td>
<td>3</td>
</tr>
<tr>
<td>HITM1228</td>
<td>Administrative Medical Terminology</td>
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<td>HITM1229</td>
<td>Administrative Pharmacology</td>
<td>3</td>
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<tr>
<td>HITM2220</td>
<td>Legal Aspects of Health Information</td>
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Suggested Technical Studies Semester II

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<tr>
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<td>Introduction to Computers</td>
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<td>HITM1209</td>
<td>HIT Practicum</td>
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<td>HITM1227</td>
<td>ICD Coding</td>
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<tr>
<td>HLTH1444</td>
<td>Introductory Anatomy and Physiology</td>
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Suggested Technical Studies Semester III

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<td>HITM2204</td>
<td>Administrative Pathophysiology</td>
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<td>HITM2212</td>
<td>Quality Improvement and Healthcare Statistics</td>
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Suggested Technical Studies Semester IV

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<tr>
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<td>HITM2206</td>
<td>HIT Professional Practice Experience</td>
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</tr>
<tr>
<td>HITM2215</td>
<td>HIT Management and Supervision</td>
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</tr>
<tr>
<td>HITM2224</td>
<td>Advanced Medical Coding</td>
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<tr>
<td>HITM2244</td>
<td>HIT Comprehensive Review</td>
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General Education

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<tr>
<th>MNTC Goal Area</th>
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<tbody>
<tr>
<td>1 Communications Oral</td>
<td>Computerized Health Information</td>
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</tr>
<tr>
<td>1 Communications-Written</td>
<td>HIT Professional Practice Experience</td>
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</tr>
<tr>
<td>4 Mathematics and Logic</td>
<td>HIT Management and Supervision</td>
<td>3</td>
</tr>
<tr>
<td>5 Social Sciences</td>
<td>Advanced Medical Coding</td>
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</tr>
<tr>
<td>6 Humanities</td>
<td>HIT Comprehensive Review</td>
<td>1</td>
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</table>

Estimated cost of books, supplies and materials: $3,700

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

Medical Office Technology Assistants work with physicians and other medical support staff. The Medical Office Technology students learn medical transcription, insurance coding and reimbursement, computerized medical records, and other medical office procedures.

**Students who have earned a grade of “C” or better, in all program classes, as well as an overall GPA of 2.5 or better will have satisfied the program requirements for the diploma.**

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 transcription or medical coding.

All students are required to purchase a program-specific laptop.

Technical Studies Prerequisites

* 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 5 or fewer errors on a 2 minute timing. Students must show proof with a high school transcript, Tech Prep certificate or other documentation showing they have completed a keyboarding course that meets these requirements. Otherwise, this course is available fall and spring semester.

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<td>HITM2220</td>
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Suggested Technical Studies Semester II

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<td>HITM1222</td>
<td>Medical Machine Transcription</td>
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<tr>
<td>HITM1227</td>
<td>ICD Coding</td>
<td>3</td>
</tr>
<tr>
<td>HITM1240</td>
<td>Computerized Health Information</td>
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<tr>
<td>HLTH1444</td>
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General Studies

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>GBEH1300</td>
<td>Human Relations</td>
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</table>

Estimated cost of books, supplies and materials: $2,950

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
**Health Care Technician**  
*Health Care Technician Certificate (29 Credits)*

**Program Description**

Health Care is one of the fastest growing industries. An aging population and the retirement of larger numbers of health care workers present a significant need for workers in health occupations. The Health Care Technician program offers the student an opportunity to prepare for entry into one of the College’s health career programs and to gain marketable skills for gainful employment.

**Career Opportunities**

The Health Care Technician Certificate program prepares the student to become a Certified Nursing Assistant/Home Health Aide with a broad base of knowledge and understanding for more health career options.

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**Technical Studies**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>HLTH1402</td>
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<tr>
<td>HLTH1404</td>
<td>Home Health Aide</td>
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<td>HLTH1430</td>
<td>Introduction to Health Careers</td>
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<td>HLTH1440</td>
<td>Medical Terminology</td>
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**General Education**

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<tbody>
<tr>
<td>ENGL1302</td>
<td>Analytical Writing</td>
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<td>CMST1320</td>
<td>Introduction to Communication Studies</td>
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<td>General Education Electives</td>
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</tr>
</tbody>
</table>

Estimated cost of books, supplies and materials: $500

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

The Heating, Air Conditioning, and Refrigeration Technology Program prepare 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 maintain refrigeration equipment, 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.

Career Opportunities

Employment is available with heating, air conditioning, and refrigeration service companies; wholesale supply companies; maintenance positions at hospitals, schools, supermarkets, etc. Positions are also available in sales, installation, design and as manufacturing representatives.

Suggested Technical Studies Semester I

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>HART1502</td>
<td>Copper and Gas Piping</td>
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<tr>
<td>HART1510</td>
<td>Sheetmetal</td>
<td>1</td>
</tr>
<tr>
<td>HART1514</td>
<td>Forced Air Heating</td>
<td>5</td>
</tr>
<tr>
<td>HART1518</td>
<td>Electrical Controls for Heating and A/C</td>
<td>4</td>
</tr>
<tr>
<td>HART1540</td>
<td>Internship - Residential</td>
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Suggested Technical Studies Semester II

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>HART1506</td>
<td>Schematics and Blue Print Reading</td>
<td>3</td>
</tr>
<tr>
<td>HART1522</td>
<td>Installation of Heating and A/C</td>
<td>3</td>
</tr>
<tr>
<td>HART1526</td>
<td>Principles of Air Conditioning</td>
<td>4</td>
</tr>
<tr>
<td>HART1530</td>
<td>Heat Pumps</td>
<td>2</td>
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<tr>
<td>HART1534</td>
<td>Troubleshooting Heating and A/C</td>
<td>3</td>
</tr>
<tr>
<td>HART1538</td>
<td>HART Job Preparation</td>
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Suggested Technical Studies Semester III

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<tbody>
<tr>
<td>HART2506</td>
<td>Commercial Refrigeration I</td>
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<tr>
<td>HART2510</td>
<td>Commercial Electrical and Controls</td>
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<td>HART2522</td>
<td>Commercial Air Conditioning</td>
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<td>HART2530</td>
<td>Commercial Load Calculating</td>
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<td>HART2540</td>
<td>Internship - Commercial</td>
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Suggested Technical Studies Semester IV

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>HART2502</td>
<td>Commercial Refrigeration II</td>
<td>4</td>
</tr>
<tr>
<td>HART2514</td>
<td>Compressor Operation and Troubleshooting</td>
<td>3</td>
</tr>
<tr>
<td>HART2518</td>
<td>Commercial Troubleshooting</td>
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</tr>
<tr>
<td>HART2526</td>
<td>Commercial Heating and HVAC Systems</td>
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<tr>
<td>HART2534</td>
<td>Commercial HVAC Controls</td>
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General Education

(must include at least three MNTC Goal Areas)

<table>
<thead>
<tr>
<th>Goal Area</th>
<th>Course Title</th>
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<tr>
<td>1</td>
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<td>MNTC Goal Area 1 Communications-Oral</td>
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<td>MNTC Goal Area 4 Mathematics</td>
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</table>

Estimated cost of books, supplies and materials: $1,300

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Commercial Heating, Air Conditioning and Refrigeration Diploma

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 maintain refrigeration equipment, 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.

Career Opportunities
Employment is available with heating, air conditioning, and refrigeration service companies; wholesale supply companies; maintenance positions at hospitals, schools, supermarkets, etc. Positions are also available in sales, installation, design and as manufacturing 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 and 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 and 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 Air Conditioning............... 3
- HART2530 Commercial Load Calculating.............. 2
- HART2540 Internship - Commercial.................... 2

Suggested Technical Studies Semester IV
- HART2502 Commercial Refrigeration II............... 4
- HART2514 Compressor Operation and Troubleshooting 3
- HART2518 Commercial Troubleshooting................ 2
- HART2526 Commercial Heating and HVAC Systems..... 3
- HART2534 Commercial HVAC Controls.................. 2

General Studies
- ENGL1100 Writing for the Workplace.................. 3
- GBEH1300 Human Relations............................ 3
- General Studies Electives.............................. 3

Estimated cost of books, supplies and materials: $1,300

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
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 maintain refrigeration equipment, heating and air conditioning systems.

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Career Opportunities

Employment is available with heating, air conditioning, and refrigeration service companies; wholesale supply companies; maintenance positions at hospitals, schools, supermarkets, etc. Positions are also available in sales, installation, design and as manufacturing representatives.

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<tr>
<td>ENGL1100</td>
<td>Writing for the Workplace</td>
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<td>GBEH1300</td>
<td>Human Relations</td>
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Estimated cost of books, supplies and materials: $1,300

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Program Description
The Cisco Networking (Associate) certificate will focus solely on training students in all areas of Local Area Networking (LAN) and Wide Area Networking (WAN) through lessons in theory and practical application. The initial course introduces generic aspects of networking and helps prepare students for the CompTIA Network+® certification exam, an internationally recognized industry credential. Subsequent Cisco Academy modules prepare students for the Cisco CCNA exam, a prestigious IT achievement. As a capstone experience, the CCNA Certification Preparation course helps to prepare students through instructor-shared experiences with the certification testing, practice tests and discussions for the CCNA exam. The Cisco Networking (Associate) certificate can be used as a standalone course of study or as an opportunity for students to continue their education in the networking major.

Students must achieve a grade of “C” or better in each required course to obtain the Cisco Networking (Associate) certificate.

Career Opportunities
Students completing the CCNA Certificate will have a highly desired course of training, which should enable them to achieve rapid promotion in the networking industry. The certificate, coupled with passing the CCNA certification exam, will enable graduates to enter the job market well ahead of their networking industry peers and garner salaries at the top of the networking pay scale.

Technical Studies
MSNA1201 Intro to Networking ........................................... 2
MSNA1204 Cisco (Exploration) Fundamentals ..................... 3
MSNA1206 Cisco (Exploration) Switching and Wireless .......... 3
MSNA2216 Cisco (Exploration) Routing Protocols and Concepts 3
MSNA2218 Cisco (Exploration) Accessing the WAN ............. 3
MSNA2228 Cisco CCNA Cert Test Prep ............................. 1

Estimated cost of books, supplies and materials: $200

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Program Description
The Network Administration major reflects current Information Technology (IT) industry requirements, with a focus on certifications. The major ties courses directly to high demand IT certifications, including those from CompTIA, Microsoft and the Certified Wireless Network Professional organization. It includes Cisco Academy curriculum, building students’ 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 Practicum and Internship experiences expose students to actual IT work environments, and allow them the opportunity to demonstrate their abilities in the presence of prospective employers. Organizations continue to expand their networking infrastructure, including networked computers and peripheral equipment of increasingly complex design and configuration. This growth ensures employment for individuals willing to achieve the knowledge and hands-on skills needed to succeed in a challenging and ever-changing technical environment.

Network Administration students must achieve a “C” (2.0) or better grade in each required technical and general education course.

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
MSNA1200 IT Essentials ................................................. 3
MSNA1201 Intro to Networking ................................................. 2
MSNA1203 MS Windows Vista 70-620 ............................................. 3
MSNA1205 Intro to Help Desk ..................................................... 3

Suggested Technical Studies Semester II
MSNA1204 Cisco (Exploration) Fundamentals ...................... 3
MSNA1209 MSNA Portfolio ......................................................... 1
MSNA1210 Network Cabling ......................................................... 3
MSNA1213 MS Server 2008 - Network Infra 70-642 ................... 3
MSNA2205 Wireless Networking .................................................. 3

Suggested Technical Studies Semester III
MSNA2201 MS Server 2008 - AD Configuration 70-640 ............. 3
MSNA2206 Network Security ......................................................... 3
MSNA2216 Cisco (Exploration) Routing Protocols and Concepts

Suggested Technical Studies Semester IV
MSNA1206 Cisco (Exploration) Switching and Wireless ............ 3
MSNA2203 MS Small Business Server 2008 ...................... 3
MSNA2211 Linux ................................................................. 3
MSNA2215 MSNA Internship ....................................................... 2

General Education
CRTK1300 Introduction to Critical Thinking ......................... 3
CMST2310 Interpersonal Communication ......................... 3
CMST1320 Introduction to Communication Studies .................. 3
MNTC Goal Area 1 Communications-Written .................... 4
MNTC Goal Area 4 Mathematics and Logic ....................... 3

Estimated cost of books, supplies and materials: $1,500
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. Additionally, students will develop written and oral communication skills, as well as build their problem solving and decision making abilities. The diploma can be used as a standalone 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 classes, such as Microsoft Office, Desktop Publishing and Website Management. Studies can lead to A+, Security+, Wireless#, and Microsoft operating system and application certifications.

PC Specialist students must achieve a “C” or better in all required technical and general education courses.

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>MSNA1200</td>
<td>IT Essentials</td>
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<tr>
<td>MSNA1201</td>
<td>Intro to Networking</td>
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<td>MSNA1203</td>
<td>MS Windows Vista 70-620</td>
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<tr>
<td>MSNA1205</td>
<td>Intro to Help Desk</td>
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Suggested Technical Studies Semester II

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<td>MSNA1210</td>
<td>Network Cabling</td>
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<td>MSNA1213</td>
<td>MS Server 2008 - Network Infra 70-642</td>
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<td>MSNA2203</td>
<td>MS Server Applications</td>
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<tr>
<td>MSNA2205</td>
<td>Wireless Networking</td>
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Suggested Technical Studies Semester III (summer)

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<tbody>
<tr>
<td>MSNA2215</td>
<td>MSNA Internship</td>
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General Studies

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<tr>
<td>ENGL1100</td>
<td>Writing for the Workplace</td>
<td>3</td>
</tr>
<tr>
<td>GBEH1300</td>
<td>Human Relations</td>
<td>3</td>
</tr>
</tbody>
</table>

Estimated cost of books, supplies and materials: $1,200

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Land Surveying/Civil Engineering

Program Description
The Land Surveying/Civil Engineering Technology Program prepares individuals for employment as engineering/surveying technicians. Students will learn surveying and drafting techniques, along with design and construction practices dealing with sewer, water, streets, roads, and land surveying. Students will be introduced to modern surveying equipment, computer applications, computer aided drafting and surveying systems.

Ability to work independently with accuracy and neatness and make decisions is a very important quality for technicians. 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.

** Students who have earned a grade of “C” or better, in all program classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for a diploma or AAS degree.

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. Drafting, computer application, testing of materials, construction surveying and inspection, land surveying, estimating or general design work are just a few examples of career possibilities. This program is articulated with several state universities in the areas of land surveying and construction management.

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
LSCE1526 Technical Computations II............................ 4

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
MATH1320 College Trigonometry.................................... 2
MATH1300 College Algebra............................................ 3
MNCT Goal Area 1 Communications-Oral....................... 3
MNCT Goal Area 1 Communications-Written.................... 4
MNCT Goal Area 5 or 6 Humanities or Social Science........ 3
General Education Electives......................................... 2

Estimated cost of books, supplies and materials: $3,025

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
**Land Surveying/Civil Engineering**

*Land Surveying/Civil Engineering Diploma (67 Credits)*

**Program Description**

The Land Surveying/Civil Engineering Technology Program prepares individuals for employment as engineering/surveying technicians. Students will learn surveying and drafting techniques, along with design and construction practices dealing with sewer, water, streets, roads, and land surveying. Students will be introduced to modern surveying equipment, computer applications, computer aided drafting and surveying systems.

Ability to work independently with accuracy and neatness and make decisions is a very important quality for technicians. 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.

** Students who have earned a grade of “C” or better, in all program classes, as well as an overall GPA of 2.0 or better will have satisfied the program requirements for a diploma or AAS degree.

**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. Drafting, computer application, testing of materials, construction surveying and inspection, land surveying, estimating or general design work are just a few examples of career possibilities. This program is articulated with several state universities in the areas of land surveying and construction management.

### Suggested Technical Studies Semester I

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<td>LSCE1510</td>
<td>Civil Drafting Methods</td>
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<tr>
<td>LSCE1518</td>
<td>Materials, Estimating, and Specifications</td>
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<td>LSCE1522</td>
<td>Technical Computations I</td>
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<tr>
<td>LSCE1530</td>
<td>Survey Fundamentals</td>
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### Suggested Technical Studies Semester II

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<td>LSCE1502</td>
<td>Surveying Principles I</td>
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<td>LSCE1506</td>
<td>Advanced Survey</td>
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<td>LSCE1514</td>
<td>Civil CADD I</td>
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<tr>
<td>LSCE1526</td>
<td>Technical Computations II</td>
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### Suggested Technical Studies Semester III

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<td>Control and Digital Surveys</td>
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<td>LSCE2514</td>
<td>Civil CADD II</td>
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<td>LSCE2518</td>
<td>Utility Design I</td>
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<td>LSCE2526</td>
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### Suggested Technical Studies Semester IV

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<td>LSCE2506</td>
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<td>LSCE2510</td>
<td>Surveying Principles II</td>
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<td>LSCE2522</td>
<td>Civil CADD III</td>
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<td>LSCE2530</td>
<td>Utility Design II</td>
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### General Studies

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<tr>
<td>ENGL 1100</td>
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<td>GBEH 1300</td>
<td>GBEH 1300 or Gen Ed from Goal 5/Goal 6/Goal 7</td>
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<td>General Studies or General Education Electives</td>
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Estimated cost of books, supplies and materials: $3,025

**PLEASE NOTE:** All program plans are preliminary and curriculum may change without notice.
Legal Support Careers
Legal Administrative Assistant AAS Degree (65 Credits)

Program Description
Administrative Support Legal Office professionals are critical to the support of attorneys and other legal staff in law firms, corporate legal departments, government agencies, and other legal service facilities. Well-trained legal office administrative support professionals assist attorneys and other legal professionals in the creation and retention of quality legal documentation and assist with other administrative duties. The AAS legal students train on the latest computer technology. They successfully complete courses and have comprehensive knowledge in litigation, family, real estate, estate planning, probate, civil, corporate, criminal, and bankruptcy law appropriate to a legal administrative assistant. Their studies also include subjects such as accounting, advanced Microsoft Office, the humanities, the social sciences, and more.

Career Opportunities
Administrative Support AAS Legal Office graduates successfully complete internships in law firms, court administrator offices, and other legal service facilities. These internship sites may lead to full-time jobs. There is a strong demand in the legal workplace for Administrative Support Legal Office graduates.

All students are required to purchase a program-specific laptop.

Technical Studies Prerequisites
* 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 5 or fewer errors on a 2 minute timing. Students must show proof with a high school transcript, Tech Prep 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
ADMS1202 Keyboarding/Word Processing .................. 3
CPTR1210 Introduction to Computers ....................... 3
LEGL1201 Paralegal Basic Law I .............................. 4
LEGL1205 Administrative Legal Office Procedures ........... 4

Suggested Technical Studies Semester II
ADMS1203 Advanced Keyboarding/Word Processing Appl 3
BUSM1217 Business Communications ........................ 3
BUSM1260 Applied Business Mathematics/Calculators ...... 3
LEGL1202 Paralegal Basic Law II ............................... 4

Suggested Technical Studies Semester III
ADMS1204 Advanced Microsoft Office ...................... 3
ADMS1206 Keyboard Speedbuilding .......................... 1
BUSM1212 Customer Relationship Management ............ 3

Suggested Technical Studies Semester IV
CSSC1302 Career Development/Job Search .................. 1
LEGL1203 Legal Research and Writing ....................... 4
LEGL1204 Administrative Legal Transcription ............... 3
LEGL2204 Family Law ........................................... 3
LEGL2210 Internship .............................................. 4

General Education
DVRS1304 Diversity and Social Justice ...................... 3
CRTK1300 Introduction to Critical Thinking ................ 3
ENGL1302 Analytical Writing .................................. 4
MNTC Goal Area 1 Communications Oral .................... 3
MNTC Goal Area 6 Humanities ................................ 3

Estimated cost of books, supplies and materials: $3,700

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Program Description
Legal Office Technology Assistants work with lawyers and other legal support staff. The Legal Office Technology Assistants train on the latest computer technology. They successfully complete courses and have comprehensive knowledge in litigation, family, real estate, estate planning, probate, civil, corporate, criminal, and bankruptcy law appropriate to a legal administrative assistant.

Career Opportunities
Legal Office Technology Assistants become employed in law firms, court administrator offices, and other legal service facilities. There is a strong demand in the legal workplace for Legal Office Technology Assistant graduates.

All students are required to purchase a program-specific laptop.

Technical Studies Prerequisites
* 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 5 or fewer errors on a 2 minute timing. Students must show proof with a high school transcript, Tech Prep 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
ADMS1202 Keyboarding/Word Processing ......................... 3
CPTR1210 Introduction to Computers .................................... 3
LEGL1201 Paralegal Basic Law I ........................................... 4
LEGL1205 Administrative Legal Office Procedures .............. 4

Suggested Technical Studies Semester II
ADMS1203 Advanced Keyboarding/Word Processing Appl. .... 3
ADMS1206 Keyboard Speedbuilding ..................................... 1
BUSM1217 Business Communications .............................. 3
LEGL1202 Paralegal Basic Law II .................................... 4
LEGL1204 Administrative Legal Transcription ................. 3

General Studies
CSSC1302 Career Development/Job Search ..................... 1
GBEH1300 Human Relations ....................................... 3

Estimated cost of books, supplies and materials: $3,700

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Legal Support Careers
Paralegal AS (60 Credits)

Program Description
The Paralegal Program prepares paralegal professionals to assist attorneys in law firms, corporate legal departments, government agencies, and other legal service facilities. The legal courses offered in this program include legal research and writing, corporate law, family law, wills, probate and estate administration, litigation, and real estate, as well as more general legal subjects. Each course is designed to develop a comprehensive knowledge in the subject area and provide students with hands-on experiences in specific legal procedures as they relate to areas of law. Paralegal students will also enhance their communication, critical thinking, creative thinking, analytical, human diversity, ethical, and global perspective competencies in their required general education curriculum.

Attorneys and other legal professionals are able to provide legal services to the public more efficiently and economically by utilizing paralegal assistance. Paralegals are trained to apply the law and legal procedures to prepare legal documents, analyze procedural and substantive legal problems, interview clients and witnesses, manage cases, and other important legal tasks.

Please note that the Paralegal program does not train graduates to provide legal services directly to the public. Any person who attempts to provide legal services directly to the public, but is not licensed to practice law, engages in the illegal and unauthorized practice of law.

**Students must earn a grade of C or better, in all program classes.

Career Opportunities
Paralegal graduates will find careers in law firms, courts, corporations, government agencies (such as police departments and the FBI), and jobs requiring legal background in many other venues. Paralegal duties vary according to the nature of employment, level of experience, and level of education. A paralegal degree may lead to other advanced legal degrees in criminal justice, jurisprudence, and other legal-related graduate studies.

Technical Studies Prerequisites
*Students entering the Paralegal AS program must type 35 words per minute with two or less errors on a two minute timing. Testing is available during registration or student may bring in a current typing test (less than one year old). If you are unable to meet the typing requirement, you must complete BUSM 1207. It is also strongly recommended that students are highly proficient in current word processing, spreadsheets

Suggested Technical Studies Semester I
LEGL1201 Paralegal Basic Law I ........................... 4

Suggested Technical Studies Semester II
LEGL1202 Paralegal Basic Law II ........................... 4
LEGL1203 Legal Research and Writing .................... 4

Suggested Technical Studies Semester III
LEGL2205 Wills, Trust and Estate Planning ........................... 3
LEGL2206 Real Estate Law ........................................... 3
LEGL2207 Litigation .................................................. 3

Suggested Technical Studies Semester IV
LEGL2204 Family Law ........................................... 3
LEGL2208 Corporate Law ........................................... 3
LEGL2209 Paralegal Internship .................................. 2

General Education
CRTK1300 Critical Thinking OR PHIL 1340 Logic .................... 3
DVRS 1304 Diversity and Social Justice .......................... 3
ENGL 1302 Analytical Writing ........................................ 4
MATH1300 College Algebra OR MATH1350 .................. 3
MNTC Goal 1 Communications (Oral) ......................... 3
MNTC Goal 5 Social, Behavior Sciences, History ................ 3
MNTC Goal 6 Humanities Arts, Lit and Philosophy ........................... 3
MNTC Goal 8 Global Perspective ................................ 3
POLS 1304 Intro to American Politics ..................... 3
General Education Electives ........................................ 3

Estimated cost of books, supplies and materials: $2000

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

St. Cloud Technical & Community College
Machine Tool Technology

Machine Tool Technology AAS Degree (72 Credits)

Program Description
The Machine Tool Technology Program provides training in the latest techniques of conventional and computerized machining. The lab is equipped with a variety of machines that are representative of today’s industry.

Machine Tool Technology is a large and expanding occupational field that offers unlimited opportunities to the energetic and competent person who wants to meet the challenge. Employment in the machine tool field is expected to be excellent far into the future. The AAS degree option allows students to transfer the general education courses to a 4-year university.

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, precision machining, setup specialist, CNC applications/sales, machining technician, CNC machining including Swiss CNC turning technology.

Suggested Technical Studies Semester I
MACH1503 Machine Technology I .............................................. 4
MACH1510 Machine Technology II ............................................ 4
MACH1517 Blueprint Reading I ................................................ 1

Suggested Technical Studies Semester II
MACH1511 Machine Tool Technology III ............................ 5
MACH1514 Introduction to Swiss Machining .......................... 2
MACH1519 Blueprint Reading II ............................................ 1
MACH1530 CNC Fundamentals ............................................. 2
TECH1530 Computer Applications ...................................... 2
TECH1550 Basic CADD ....................................................... 2
TECH1552 Basic Metal Joining and Fabrication ...................... 2

Suggested Technical Studies Semester III
MACH1525 Geometric Dimensioning and Tolerancing .......... 1
MACH2502 Introduction to CNC Turning ............................ 3
MACH2506 Introduction to CNC Milling ............................ 3
MACH2510 Cutting Tool Technology ................................ 1
MACH2514 Metallurgy ......................................................... 1
MACH2523 High Performance Manufacturing .................... 1
MACH2528 Electrical Discharge Machining ...................... 2
MACH2537 Swiss CNC Turning Advanced .......................... 3
TECH1554 Basic Electric Circuits ....................................... 2

Suggested Technical Studies Semester IV
MACH1528 Jigs and Fixtures .............................................. 1
MACH2518 Advanced CNC Milling .................................... 3
MACH2526 Advanced CNC Turning ................................... 3
MACH2530 3D Milling ....................................................... 2

Technical Electives Choose 5 credit:
Technical Electives Choose 5 credits: ......................... 5

General Education
MATH1300 College Algebra ............................................. 3
MATH1320 College Trigonometry .................................. 2
PHYS1300 General Physics ........................................... 4
CMST1320 Introduction to Communication Studies .......... 3
General Education Electives ........................................... 4

Estimated cost of books, supplies and materials: $2,400

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

Program Description

The Machine Tool Technology Program provides training in the latest techniques of conventional and computerized machining. The lab is equipped with a variety of machines that are representative of today's industry.

Machine Tool Technology is a large and expanding occupational field that offers unlimited opportunities to the energetic and competent person who wants to meet the challenge. Employment in the machine tool field is expected to be excellent far into the future.

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, precision machining, setup specialist, CNC applications/sales, machining technician, CNC machining including Swiss CNC turning technology.

Suggested Technical Studies Semester I

<table>
<thead>
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<td>MACH1510 Machine Technology II</td>
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<tr>
<td>MACH1517 Blueprint Reading I</td>
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<tr>
<td>TECH1500 Applied Algebra</td>
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<tr>
<td>TECH1522 Manufacturing Math</td>
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Suggested Technical Studies Semester II

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<tr>
<td>MACH1511 Machine Tool Technology III</td>
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<td>MACH1514 Introduction to Swiss Machining</td>
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<tr>
<td>MACH1519 Blueprint Reading II</td>
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<tr>
<td>TECH1530 CNC Fundamentals</td>
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<tr>
<td>TECH1550 Computer Applications</td>
<td>2</td>
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<tr>
<td>TECH1550 Basic CADD</td>
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<td>TECH1552 Basic Metal Joining and Fabrication</td>
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Suggested Technical Studies Semester III

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<tr>
<td>MACH1525 Geometric Dimensioning and Tolerancing</td>
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<td>MACH2502 Introduction to CNC Turning</td>
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<tr>
<td>MACH2506 Introduction to CNC Milling</td>
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<tr>
<td>MACH2510 Cutting Tool Technology</td>
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<td>MACH2514 Metallurgy</td>
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<td>MACH2523 High Performance Manufacturing</td>
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<td>MACH2528 Electrical Discharge Machining</td>
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<td>MACH2537 Swiss CNC Turning Advanced</td>
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<td>TECH1554 Basic Electric Circuits</td>
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Suggested Technical Studies Semester IV

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<tr>
<td>MACH1528 Jigs and Fixtures</td>
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<td>MACH2518 Advanced CNC Milling</td>
<td>3</td>
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<td>MACH2526 Advanced CNC Turning</td>
<td>3</td>
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<tr>
<td>MACH2530 3D Milling</td>
<td>2</td>
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<td>MACH2533 Advanced Electrical Discharge Machining</td>
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<td>MACH2544 CNC/CAM Capstone</td>
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General Studies

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<td>ENGL1100 Writing for the Workplace</td>
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<td>GBEH1300 Human Relations</td>
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<td>General Studies Electives</td>
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Estimated cost of books, supplies and materials: $2,400

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

This program prepares the student to create mechanical drawings that meet industry standards. These drawings are used to create components and products. Drawings, whether plotted on paper or in an electronic format are the universal graphic language in the manufacturing industry. Students will create designs and drawings for products and machines using state of the art computer hardware and the latest available 2d drawing/design, 3d modeling and computer aided manufacturing software. Students will create designs for simple components, complex machines and consumer products. Many things need to be considered when creating or changing existing products, such as economics, manufacturability, and aesthetics. These are a few of the challenges today's mechanical designer faces.

The Mechanical Design Technology program consists of a concentration of hands-on technology and related math and general education courses. It also has students learning hands-on basics in related fields such as electronics, machine shop, and welding. Courses are designed to produce a well-rounded graduate with a “hands-on” perspective of the manufacturing industry.

Career Opportunities

Graduates of the Mechanical Design Technology program 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. Graduates will utilize mathematics and problem solving skills concerning strength, quality, cost and product appearance. 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 demand for well-rounded individuals with practical hands-on education is growing. For individuals interested in changing the way America creates and produces goods, the Mechanical Design Technology program offers an excellent opportunity to do so.

Designers in industry serve society by creating new products and redesigning existing ones that need improvement.

Suggested Technical Studies Semester I

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>CADD1502</td>
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<td>CADD Applications I</td>
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<td>Computer Applications</td>
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<tr>
<td>TECH1552</td>
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Suggested Technical Studies Semester II

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<td>CADD1516</td>
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<td>CADD1522</td>
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Suggested Technical Studies Semester III

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<td>CADD2509</td>
<td>Production CADD II</td>
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<tr>
<td>CADD2518</td>
<td>Statics and Strength of Materials</td>
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<tr>
<td>CADD2529</td>
<td>Manufacturing Systems</td>
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<tr>
<td>TECH1554</td>
<td>Basic Electric Circuits</td>
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Suggested Technical Studies Semester IV

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<td>Computer- Aided Design</td>
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<td>Machine Design</td>
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<td>CADD2531</td>
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<td>CADD2541</td>
<td>Basic CAM</td>
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<td>CADD2542</td>
<td>Reverse Engineering</td>
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<td>TECH1540</td>
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General Education

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<td>MATH1320</td>
<td>College Trigonometry</td>
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<td>MNTC Goal Area 1 Communications</td>
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<tr>
<td>MNTC Goal Area 5 or 6 Social Sciences/Humanities</td>
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Estimated cost of books, supplies and materials: $3,610

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

This program prepares the student to create mechanical drawings that meet industry standards. These drawings are used to create components and products. Drawings, whether plotted on paper or in an electronic format are the universal graphic language in the manufacturing industry. Students will create designs and drawings for products and machines using state of the art computer hardware and the latest available 2d drawing/design, 3d modeling and computer aided manufacturing software. Students will create designs for simple components, complex machines and consumer products. Many things need to be considered when creating or changing existing products, such as economics, manufacturability, and aesthetics. These are a few of the challenges today's mechanical designer faces.

The Mechanical Design Technology program consists of a concentration of hands-on technology and related math and general studies courses. It also has students learning hands-on basics in related fields such as electronics, machine shop, and welding. Courses are designed to produce a well-rounded graduate with a “hands-on” perspective of the manufacturing industry.

Career Opportunities

Graduates of the Mechanical Design Technology program 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. Graduates will utilize mathematics and problem solving skills concerning strength, quality, cost and product appearance. 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 demand for well-rounded individuals with practical hands on education is growing. For individuals interested in changing the way America creates and produces goods, the Mechanical Design Technology Program offers an excellent opportunity to do so.

Designers in industry serve society by creating new products and redesigning existing ones that need improvement.

<table>
<thead>
<tr>
<th>Suggested Technical Studies Semester I</th>
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<tbody>
<tr>
<td>CADD1502 Mechanical CADD I ..................</td>
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<tr>
<td>CADD1512 CADD Applications I ................</td>
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<td>TECH1500 Applied Algebra ....................</td>
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<tr>
<td>TECH1552 Basic Metal Joining and Fabrication</td>
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<thead>
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<td>CADD1522 Applied Physics .....................</td>
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<td>TECH1556 Basic Manual - Automated Machining</td>
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<tr>
<td>CADD2505 Production CADD I ..................</td>
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<tr>
<td>CADD2518 Statics and Strength of Materials</td>
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<td>CADD2514 Computer- Aided Design ...............</td>
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<tr>
<td>CADD2522 Machine Design .....................</td>
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<td>CADD2542 Reverse Engineering ..................</td>
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<tr>
<td>ENGL1100 Writing for the Workplace ..............</td>
<td>3</td>
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<td>GBEH1300 Human Relations ..........................</td>
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<td>General Studies Electives ..........................</td>
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Estimated cost of books, supplies and materials: $3,610

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Program Description
An advanced certificate is available to graduates of the Machine Tool Technology and Mechanical Design Technology programs. This program allows students to expand the breadth of computer design and CNC (Computer Numeric Control) and related technologies. The cross-functional nature of the advanced certificate broadens their experience in machining and design applications. To enroll in this program a student must have graduated from either the Machine Tool Technology or Mechanical Design Technology AAS or Diploma program.

Career Opportunities
Mechanical Design and Manufacturing Technology is a large and expanding occupational field that offers unlimited opportunities to the energetic and competent persons who want to meet the challenge. Employment in the machining and design fields is expected to be excellent far into the future. 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. Because of the industry’s rapid growth, the demand for qualified people in this technical field exceeds supply. For students interested in making a mark in modern day technology, Mechanical Design and Manufacturing Technology offers and excellent opportunity. 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.

Mechanical Design Graduates:

Suggested Technical Studies Semester V
MACH2502 Introduction to CNC Turning......................... 3
MACH2506 Introduction to CNC Milling........................ 3
MACH2510 Cutting Tool Technology ................................ 1
MACH2514 Metallurgy.................................................... 1
MACH2523 High Performance Manufacturing .................... 1

Suggested Technical Studies Semester VI
CADM3502 CMM Operations ........................................ 2
MACH1528 Jigs and Fixtures ......................................... 1
MACH2518 Advanced CNC Milling .................................. 3
MACH2526 Advanced CNC Turning ................................. 3
MACH2530 3D Milling ................................................... 2

Estimated cost of books, supplies and materials: $2,500

Machine Tool Graduates:

Suggested Technical Studies Semester V
CADD1502 Mechanical CADD I ................................. 3
CADD1512 CADD Applications ................................. 3
CADD1519 Engineering Math ...................................... 1
CADD2528 Manufacturing Systems ............................. 1
Technical Electives .................................................... 1

Suggested Technical Studies Semester VI
CADD1507 Mechanical CADD II .................................. 3
CADD1516 CADD Applications II .............................. 3
CADD2541 Basic CAM ............................................... 2
CADM3502 CMM Operations ....................................... 2
TECH1540 Technical Communications.......................... 1

Estimated cost of books, supplies and materials: $2,500

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)

St. Cloud Technical & Community College

Program Description
The growing demand to transport products quickly by trucks has created an increasing need for skilled medium/heavy truck technicians. Students will perform maintenance, repair, and overhaul on medium/heavy duty trucks and tractor/trailer vehicles. 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 selecting this program will 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. Instruction is also given in related truck area studies such as welding, transport refrigeration, automatic transmissions, and truck body repair.

St. Cloud Technical and Community College’s Medium Heavy Truck Technician Program is ASE Certified and graduates are prepared for the Automotive Service Excellence examinations. The program is certified by the National Automotive Technicians Education Foundation, Inc. (NATEF). The Transportation Studies Core also meets some of the requirements for graduation in the Automotive Service Technician Program.

Career Opportunities
Major employers are independent truck repair shops, truck dealers, and firms that own large fleets of truck transports. After completion of training, 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
MHTT1502 Diesel Engine I .................................. 4
MHTT1506 Mobile Hydraulics ........................................ 2
MHTT1508 Truck Computer Systems .................................. 2
TRAN1502 General Service ........................................ 2
TRAN1504 Electricity and Electronic Principles ............... 3
TRAN1518 Transportation Hazardous Materials .............. 1

Suggested Technical Studies Semester II
MHTT1514 Truck Brake Systems .................................. 4
MHTT1518 Truck Steering/Suspension ......................... 3
MHTT1522 Electrical II .................................................. 2
MHTT1526 Truck Maintenance I .................................. 3
TRAN2514 Basic Air Conditioning ................................ 2

Suggested Technical Studies Semester III
MHTT1510 Truck Power Train .................................... 4
MHTT2502 Diesel II ............................................... 4
TRAN1520 Workplace Perceptions and Expectations .......... 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

Technical Electives Choose 6 credits
Technical Electives .................................................. 6

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: $3,200

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Medium/Heavy Truck Technician
Medium/Heavy Truck Technician Diploma (67 Credits)

Program Description
The growing demand to transport products quickly by trucks has created an increasing need for skilled medium/heavy truck technicians. Students will perform maintenance, repair, and overhaul on medium/heavy duty trucks and tractor/trailer vehicles. 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 selecting this program will develop and practice skills in a well-equipped shop and study challenging areas such as truck computers, diesel engines, electrical systems, suspension, air brakes, and power-train. Instruction is also given in related truck area studies such as welding, transport refrigeration, automatic transmissions, and truck body repair.

St. Cloud Technical and Community College’s Medium Heavy Truck Technician Program is ASE Certified and graduates are prepared for the Automotive Service Excellence examinations. The program is certified by the National Automotive Technicians Education Foundation, Inc. (NATEF). The Transportation Studies Core also meets some of the requirements for graduation in the Automotive Service Technician Program.

Career Opportunities
Major employers are independent truck repair shops, truck dealers and firms, which own large fleets of truck transports. After completion of training, 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
- MHTT1502 Diesel Engine I ............................................................. 4
- MHTT1506 Mobile Hydraulics ......................................................... 2
- MHTT1508 Truck Computer Systems ............................................. 2
- TRAN1502 General Service ......................................................... 2
- TRAN1504 Electricity and Electronic Principles ............................. 3
- TRAN1518 Transportation Hazardous Materials ............................. 1

Suggested Technical Studies Semester II
- MHTT1514 Truck Brake Systems .................................................... 4
- MHTT1518 Truck Steering/Suspension ............................................. 3
- MHTT1522 Electrical II ................................................................. 2
- MHTT1526 Truck Maintenance I .................................................... 3
- TRAN2514 Basic Air Conditioning ................................................ 2

Suggested Technical Studies Semester III
- MHTT1510 Truck Power Train ....................................................... 4
- MHTT2502 Diesel II ................................................................. 4
- TRAN1520 Workplace Perceptions and Expectations .................... 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

Technical Studies Electives
- Technical Studies Electives ......................................................... 9

General Studies
- Communications-Written ....................................................... 3
- General Studies Electives ......................................................... 4

Estimated cost of books, supplies and materials: $3,200

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Nursing Assistant/Home Health Aide

Nursing Assistant

Program Description

Today's health care industry is in need of caregivers at all levels; Nursing Assistants, Home Health Aides/Homemakers, Licensed Practical Nurses, Registered Nurses and many specialty areas. The Nursing Assistant course prepares the students to provide caregiving skills in a supervised simulation laboratory and in an actual work environment. This Minnesota Department of Health approved courses prepare students to complete a written and skills test in order to be placed on the State Registry and work as a Nursing Assistant/Home Health Aide. Attendance of 75 hours or more of the Nursing Assistant course is mandatory.

Before the student begins clinicals, he/she must obtain a uniform and have evidence of a negative Mantoux or chest x-ray within the past three months showing no active tuberculosis. A Minnesota background check is also required. Information about uniforms, Mantoux and background checks will be discussed the first class session.

Upon completion of all class hours, students will be eligible to take the state exam offered at St. Cloud Technical and Community College (cost is $175) and upon passing, will be recognized by the state of Minnesota in its registry of Nursing Assistants/Home Health Aides.

The college continually accepts interested students into this course.

Career Opportunities

There is a continuous need for Nursing Assistant/Home Health Aides. A benefit to those students who become employed within 12 months of completing the program is that the state licensed nursing home, which employs the student, will reimburse the student for the course and test-out fees. To remain on the Minnesota registry, an individual must complete 12 hours of education every year and work in the field at least eight paid hours every two years.

Technical Studies

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<tr>
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<td>Nursing Assistant</td>
<td>3</td>
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<tr>
<td>HLTH1404</td>
<td>Home Health Aide</td>
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Estimated cost of books, supplies and materials: $85

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

Graduates of the Paramedicine A.A.S. program will be eligible to take the national level Paramedicine exam and have the knowledge and skills necessary to be a competent and successful entry-level paramedic. The Paramedic (EMT-P) works in the exciting and expanding field of Emergency Medical Services (EMS).

This degree incorporates theoretical knowledge with extensive clinical application and experience. The specialization, advanced education and training in the care and transport of the critically ill and injured can mean the difference between life and death. AAS degree graduates have greater potential for upward progression in the career of pre-hospital care.

The St. Cloud Technical and Community College Paramedicine AAS program is accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP).

**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.

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**Technical Studies Prerequisites**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>HLTH1440 Medical Terminology</td>
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* CPR for Healthcare Provider and EMT Basic are also required before beginning the Paramedicine program. (must submit CPR and MN EM-SRB EMTB card)

* Applicant may only apply after successful completion of the acceptance requirements. These courses must be completed prior to starting the program.

* General Education requirements should be completed prior to starting core courses. General Biology (BLGY 1351) is a prerequisite to Paramedicine I (EMSP 1400).

**Suggested Technical Studies Semester I**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>EMSP1400 Paramedicine I</td>
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<tr>
<td>EMSP1402 Paramedicine Skills I</td>
<td>3</td>
</tr>
<tr>
<td>EMSP1404 Emergency Pharmacology for Paramedics</td>
<td>2</td>
</tr>
<tr>
<td>EMSP1406 Paramedicine II</td>
<td>3</td>
</tr>
<tr>
<td>EMSP1408 Paramedicine Skills II</td>
<td>3</td>
</tr>
<tr>
<td>EMSP1430 BLS Ambulance Clinical</td>
<td>1</td>
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<tr>
<td>EMSP2462 PHTLS Provider</td>
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<tr>
<td>HLTH1448 Infection Control</td>
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**Suggested Technical Studies Semester II**

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<tr>
<td>EMSP1432 Critical Care Clinical</td>
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</tr>
<tr>
<td>EMSP1434 Support Services Clinical</td>
<td>2</td>
</tr>
<tr>
<td>EMSP1440 ALS Ambulance Clinical</td>
<td>3</td>
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<tr>
<td>EMSP2410 Paramedicine III</td>
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<tr>
<td>EMSP2412 Paramedicine Skills III</td>
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<tr>
<td>EMSP2460 ACLS Provider</td>
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<tr>
<td>EMSP2468 PALS Provider Course</td>
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**Suggested Technical Studies Semester III**

<table>
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<tr>
<th>Course</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>EMSP2438 Emergency Department Clinical</td>
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<tr>
<td>EMSP2442 Acute Care Clinical</td>
<td>2</td>
</tr>
<tr>
<td>EMSP2472 PEPP Provider</td>
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<tr>
<td>EMSP2480 Paramedicine Externship</td>
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**General Education**

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<th>Course</th>
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<tbody>
<tr>
<td>BLGY2320 Human Anatomy/Physiology II</td>
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<tr>
<td>BLGY2310 Human Anatomy/Physiology I</td>
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<tr>
<td>MNTC Goal Area 1 Written Communication</td>
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<td>MNTC Goal Area 6 Humanities</td>
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<tr>
<td>Psychology</td>
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Estimated cost of books, supplies and materials: $2,500

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**PLEASE NOTE:** All program plans are preliminary and curriculum may change without notice.
Paramedicine
Paramedicine Evening Program AAS Degree  (64 Credits)

Program Description
Graduates of this Associate Degree program will be qualified and skilled professionals in the field of Emergency Medical Services as Paramedics. The Emergency Medical Technician-Paramedic (EMT-P) works in the exciting, expanding field of Emergency Medical Services (EMS).

This degree incorporates theoretical knowledge with extensive clinical application and experience. The specialization, advanced education and training in the care and transport of the critically ill and injured can mean the difference between life and death. AAS degree graduates have enhanced potential for upward progression in the career of pre-hospital care.

The St. Cloud Technical and Community College Paramedicine AAS program is accredited by the Commission on Accreditation of Allied Health Education Programs.

Career Opportunities
Career opportunities for paramedics include: private ambulance companies, hospitals, industry and 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 Prerequisites
HLTH1440  Medical Terminology............................................... 1
CPR for Healthcare Provider and EMT Basic are also required before beginning the Paramedicine program. (must submit CPR and MN EM-SRB EMTB card)

* Applicant may only apply after successful completion of the acceptance requirements. These courses must be completed prior to starting the program.

* General Education requirements should be completed prior to starting core courses. General Biology (BLGY 1351) is a prerequisite to Paramedicine I (EMSP 1400).

Suggested Technical Studies Semester I
EMSP1400  Paramedicine I ..................................................... 3
EMSP1402  Paramedicine Skills I ........................................... 3
EMSP1430  BLS Ambulance Clinical ........................................ 1
EMSP2462  PHTLS Provider ................................................... 1
HLTH1448  Infection Control................................................... 1

Suggested Technical Studies Semester II
EMSP1404  Emergency Pharmacology for Paramedics .............. 2
EMSP1406  Paramedicine II ..................................................... 3
EMSP1408  Paramedicine Skills II ............................................ 3

Suggested Technical Studies Semester III
EMSP1432  Critical Care Clinical ............................................ 2
EMSP1434  Support Services Clinical ......................................... 2
EMSP1440  ALS Ambulance Clinical ......................................... 3
EMSP2460  ACLS Provider .................................................... 1
EMSP2468  PALS Provider Course ........................................... 1

Suggested Technical Studies Semester IV
EMSP2410  Paramedicine III .................................................. 4
EMSP2412  Paramedicine Skills III ........................................... 2
EMSP2438  Emergency Department Clinical ............................... 3

Suggested Technical Studies Semester V
EMSP2442  Acute Care Clinical ............................................... 2
EMSP2472  PEPP Provider ...................................................... 1
EMSP2480  Paramedicine Externship ......................................... 8

General Education
BLGY2320  Human Anatomy/Physiology II ....................... 4
BLGY2310  Human Anatomy/Physiology I ............................... 4
MNTC Goal Area 1 Communications Written ...................... 4
MNTC Goal Area 6 Humanities ............................................ 3
Psychology ................................................................. 3

Estimated cost of books, supplies and materials: $2,500

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Paraprofessional Educator  
*Paraprofessional Educator AAS Degree (65 Credits)*

**Program Description**
This program meets the requirements and recent federal legislation regarding the employment of paraprofessionals. In order to satisfy the requirement, school districts are encouraged to employ paraprofessionals who have completed two years of study at an institution of higher education; or obtained an Associates (or higher) Degree, or who have met a rigorous standard of quality and can demonstrate knowledge of and the ability to assist in instructing reading, writing, and mathematics.

This curriculum follows the Minnesota Core Instructional Paraprofessional Competencies which will form the basis of a credentialing system for instructional paraprofessionals. The competencies are statements that indicate the knowledge and skills needed for the paraprofessional to work successfully in educational settings. Students are provided classroom instruction and practical experience in a variety of educational settings, including Early Childhood Family Education (ECFE), Early Childhood Special Education (ECSE), Title 1, Head Start, preschools, elementary schools, secondary schools, and other special education programs. Membership in a professional organization is strongly recommended. Many of these courses can be used toward a birth through 3rd grade teaching license at some 4 year colleges or universities.

Applicants to the Paraprofessional Educator Program must complete any college readiness course with a passing grade, if indicated by their Accuplacer scores prior to enrolling in program courses.

Before being placed on an internship, students will be required to complete and submit a Department of Human Services (DHS) Background Study Form, Pre-Entrance Medical Exam, and Immunization Record.

**Career Opportunities**
Job opportunities for Paraprofessional Education graduates may be found in Special Education, Title 1, Bilingual Programs, and Career and Technical Education. These jobs may be found in a variety of settings including Early Childhood Family Education (ECFE), Early Childhood Special Education (ECSE), Title 1, Head Start, preschools, elementary schools, secondary schools, special education programs. Personal qualities desirable for the field include emotional maturity, physical stamina, the ability to work with people in a variety of settings, and acceptance of people with diverse backgrounds.

*Note: First Aid & CPR for Child Care or equivalent required: Current CPR, Shaken Baby and Sudden Infant Death certification must be maintained throughout the program. This is a pre-requisite for CACE1460.*

<table>
<thead>
<tr>
<th>Suggested Technical Studies Semester I</th>
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<tbody>
<tr>
<td>CACE1400 Professional Relations in CACE Careers</td>
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<tr>
<td>CACE1420 Foundations of Development</td>
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<tr>
<td>CACE1440 Guidance: Managing the Physical and Social Environment</td>
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<td>CACE1444 Planning and Implementing Curriculum</td>
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<td>CACE1460 Internship I</td>
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<tr>
<td>EMSCE1404 First Aid and CPR for Child Care Providers</td>
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<tr>
<td>CACE1404 Safety, Health and Nutrition</td>
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<tr>
<td>CACE1422 Profiles of the Exceptional Child</td>
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<td>CACE1424 School-Age Strategies for Learning</td>
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<td>CACE1464 Internship II</td>
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<td>CACE1470 Professional and Leadership Development</td>
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<td>CACE1428 Family and Community Relations</td>
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<td>CACE1471 Motivational, Professional and Leadership Dev</td>
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<td>CACE1473 Strategies in Reading for the Paraprofessional</td>
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<td>CACE1476 Writing Strategies for Paraprofessionals</td>
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<tr>
<td>CACE1426 Children with Difficult Behaviors</td>
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<td>CACE1474 Strategies in Math for Paraprofessionals</td>
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<td>CACE1478 Technology Strategies for Paraprofessionals</td>
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<tr>
<th>Technical Electives</th>
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<table>
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<tr>
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<tbody>
<tr>
<td>MNTC Goal Area 1 Communications-Oral</td>
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<tr>
<td>MNTC Goal Area 1 Communications-Written</td>
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<tr>
<td>MNTC Goal Area 3 or 4 Natural Science OR Mathematics/Logic</td>
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<td>MNTC Goal Area 5 Social Sciences</td>
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<tr>
<td>MNTC Goal Area 6 Humanities</td>
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General Education Electives | 6

Estimated cost of books, supplies and materials: $913

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

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. One of the main class projects involves installation of the plumbing and fixtures in the house project built each year by the building trades classes. 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.

Career Opportunities

The plumbing industry presents many outstanding opportunities for advancement and success in residential, commercial, industrial and service plumbing. Skilled mechanics in this trade are among the highest paid of any craft. In this field, initiative and ability are rewarded. 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.

Suggested Technical Studies Semester I

<table>
<thead>
<tr>
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<th>Course Title</th>
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<td>Piping Procedures I</td>
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<td>PLBG1508</td>
<td>Plumbing Calculations I</td>
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<td>PLBG1510</td>
<td>Minnesota State Plumbing Code I</td>
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<tr>
<td>PLBG1518</td>
<td>Blueprint Reading and Estimating I</td>
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Suggested Technical Studies Semester II

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<td>PLBG1520</td>
<td>Blueprint Reading and Estimating II</td>
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<td>PLBG1524</td>
<td>Plumbing Calculations II</td>
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<tr>
<td>PLBG1530</td>
<td>Piping Procedures II</td>
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<tr>
<td>PLBG1538</td>
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<tr>
<td>PLBG1544</td>
<td>Career Planning/Customer Relations</td>
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Technical Electives

- Technical Electives .................................................. 9

General Education

- CMST1320  Introduction to Communication Studies .......... 3
- ENGL1302  Analytical Writing ....................................... 4
- MNTP Goal Area 4 Mathematics and Logic ......................... 3
- MNTP Goal Area 5 Social Sciences .................................. 3
- MNTP Goal Area 6 Humanities ...................................... 3
- General Education Electives ........................................ 4

Estimated cost of books, supplies and materials: $1,000

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. One of the main class projects involves installation of the plumbing and fixtures in the house project built each year by the building trades classes. 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.

Career Opportunities
The plumbing industry presents many outstanding opportunities for advancement and success in residential, commercial, industrial and service plumbing. Skilled mechanics in this trade are among the highest paid of any craft. In this field, initiative and ability are rewarded. 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.

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
GBEH1300 Human Relations ................................... 3
General Studies Electives ......................................... 3

Estimated cost of books, supplies and materials: $850

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

Program Description

Practical Nursing is a challenging, meaningful, and fulfilling career with the benefits of intellectual stimulation, attractive earning potential, personal rewards, and excitement! 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. We are very proud of the college’s state-of-the-art nursing simulation lab that allows for the integration of instruction and clinical practice.

The program exists to educate and prepare individuals to complete the National Council Licensure Exam (NCLEX-PN), and to encourage individuals to engage in lifelong learning; continued learning is essential in a society that seeks well-trained healthcare workers for the benefit of patient health, quality of life and the well-being of the community. All program Core requirements must be completed at SCTCC. Students may be admitted to the Nursing Program only two times.

Admission to the program is highly competitive and requires the student to attend a pre-program informational session. Admission requirements are subject to change, please view the web-site for up to date information. For consideration into the nursing program, students must have completed all prerequisite courses with a minimum GPA of 2.5 or above.

A graduate of the Practical Nursing program provides a foundation for career mobility with associate or baccalaureate RN programs.

The Practical Nursing Program is accredited by the Minnesota State Board of Nursing.

Career Opportunities

Today we are finding businesses and occupations being laid off, however, health care continues to need highly qualified and competent workers. According to the latest projections from the U.S. Bureau of Labor Statistics published in the November 2009 Monthly Labor Review, more than 581,500 new nursing positions will be created through 2018 (a 22.2% increase), making nursing the nation’s top profession in terms of projected job growth. The SCTCC Practical Nursing Program has consistently placed its graduates throughout the St. Cloud area and Minnesota.

Technical Studies Prerequisites

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>HLTH1440</td>
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<td>BLGY2310</td>
<td>Human Anatomy/Physiology I</td>
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<td>BLGY2320</td>
<td>Human Anatomy/Physiology II</td>
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<td>BLGY2330</td>
<td>Microbiology</td>
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<td>CMST2310</td>
<td>Interpersonal Communication</td>
<td>3</td>
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<tr>
<td>ENGL1302</td>
<td>Analytical Writing</td>
<td>3</td>
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<tr>
<td>PHIL1320</td>
<td>Ethics</td>
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<td>PSYC1304</td>
<td>Life Span Developmental Psychology</td>
<td>3</td>
</tr>
<tr>
<td>General Education Electives</td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

* THE FOLLOWING CERTIFICATIONS/REGISTRATIONS MUST BE CURRENT AND ON FILE PRIOR TO ADMISSION INTO THE PROGRAM -- CPR/AED Adult, Child and Infant (Health Care Provider Level) -- HLTH 1402 NA or verification of completion of a 75 hour NA course.

* Applicant may only apply after successful completion of acceptance 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 general education course work.

* A minimum grade of “C” of better and a cumulative GPA of 2.5 or above in general education coursework is required to be considered for admission and must be maintained.

Technical Studies Semester I

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PRSG2401</td>
<td>Medical Surgical Nursing I</td>
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<tr>
<td>PRSG2409</td>
<td>Basic Nursing Concepts</td>
<td>3</td>
</tr>
<tr>
<td>PRSG2419</td>
<td>Nursing Skills</td>
<td>3</td>
</tr>
<tr>
<td>PRSG2429</td>
<td>Essentials of Clinical Pharmacology</td>
<td>2</td>
</tr>
<tr>
<td>PRSG2439</td>
<td>Clinical Application I</td>
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Technical Studies Semester II

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>PRSG2402</td>
<td>Medical Surgical Nursing II</td>
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<td>PRSG2410</td>
<td>Advanced Nursing Role Concepts</td>
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<td>PRSG2440</td>
<td>Clinical Application II</td>
<td>5</td>
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<tr>
<td>PRSG2450</td>
<td>Family Health Nursing</td>
<td>3</td>
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<tr>
<td>PRSG2460</td>
<td>Mental Health Nursing</td>
<td>2</td>
</tr>
</tbody>
</table>

Estimated cost of books, supplies and materials: $3,500

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

Program Description

Practical Nursing is a challenging, meaningful, and fulfilling career with the benefits of intellectual stimulation, attractive earning potential, personal rewards, and excitement! 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. We are very proud of the college’s state-of-the-art nursing simulation lab that allows for the integration of instruction and clinical practice.

The program exists to educate and prepare individuals to complete the National Council Licensure Exam (NCLEX-PN), and to encourage individuals to engage in lifelong learning; continued learning is essential in a society that seeks well-trained healthcare workers for the benefit of patient health, quality of life and the well-being of the community. All program Core requirements must be completed at SCTCC. Students may be admitted to the Nursing Program only two times.

Admission to the program is highly competitive and requires the student to attend a pre-program informational session. Admission requirements are subject to change, please view the web-site for up to date information. For consideration into the nursing program, students must have completed all prerequisite courses with a minimum GPA of 2.5 or above.

A graduate of the Practical Nursing Diploma program provides a foundation for career mobility with associate in applied science in practical nursing then on to associate or baccalaureate RN programs.

The Practical Nursing program is accredited by the Minnesota State Board of Nursing.

Career Opportunities

Today we are finding businesses and occupations being laid off, however, health care continues to need highly qualified and competent workers. According to the latest projections from the U.S. Bureau of Labor Statistics published in the November 2009 Monthly Labor Review, more than 581,500 new nursing positions will be created through 2018 (a 22.2% increase), making nursing the nation’s top profession in terms of projected job growth. The SCTCC Practical Nursing Program has consistently placed its graduates throughout the St. Cloud area and Minnesota.

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<td>ENGL1302</td>
<td>Analytical Writing</td>
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<tr>
<td>PSYC1304</td>
<td>Life Span Developmental Psychology</td>
<td>3</td>
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* Applicant may only apply after successful completion of acceptance requirements. In addition, students must have completed the Accuplacer with scores above the cutoff points for Practical Nursing or successful completion of equivalent General Education/General Studies coursework.

* A minimum grade of “C” or better and a cumulative GPA of 2.5 or above in general education coursework is required to be considered for admission and must be maintained. All general education coursework must be completed prior to admission to the program.

Technical Studies Semester I

<table>
<thead>
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<th>Course</th>
<th>Description</th>
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<td>Medical Surgical Nursing I</td>
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<td>Basic Nursing Concepts</td>
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<td>PRSG2419</td>
<td>Nursing Skills</td>
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<td>PRSG2429</td>
<td>Essentials of Clinical Pharmacology</td>
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<td>PRSG2439</td>
<td>Clinical Application I</td>
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Technical Studies Semester II

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<th>Description</th>
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<td>PRSG2402</td>
<td>Medical Surgical Nursing II</td>
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<td>Advanced Nursing Role Concepts</td>
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<td>PRSG2440</td>
<td>Clinical Application II</td>
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<td>PRSG2450</td>
<td>Family Health Nursing</td>
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<td>PRSG2460</td>
<td>Mental Health Nursing</td>
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Estimated cost of books, supplies and materials: $3,000

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Practical Nursing
Practical Nursing-Part-Time AAS Degree (60 Credits)

Program Description
Practical Nursing is a challenging, meaningful, and fulfilling career with the benefits of intellectual stimulation, attractive earning potential, personal rewards, and excitement! 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. We are very proud of the college’s state-of-the-art nursing simulation lab that allows for the integration of instruction and clinical practice.

The program exists to educate and prepare individuals to complete the National Council Licensure Exam (NCLEX-PN), and to encourage individuals to engage in lifelong learning; continued learning is essential in a society that seeks well-trained healthcare workers for the benefit of patient health, quality of life and the well-being of the community. All program Core requirements must be completed at SCTCC. Students may be admitted to the Nursing Program only two times.

Admission to the program is highly competitive and requires the student to attend a pre-program informational session. Admitance requirements are subject to change, please view the web-site for up to date information. For consideration into the nursing program, students must have completed all prerequisite courses with a minimum GPA of 2.5 or above.

A graduate of the Practical Nursing program provides a foundation for career mobility with associate or baccalaureate RN programs.

The Practical Nursing Program is accredited by the Minnesota State Board of Nursing.

Career Opportunities
Today we are finding businesses and occupations being laid off, however, health care continues to need highly qualified and competent workers. According to the latest projections from the U.S. Bureau of Labor Statistics published in the November 2009 Monthly Labor Review, more than 581,500 new nursing positions will be created through 2018 (a 22.2% increase), making nursing the nation’s top profession in terms of projected job growth. The SCTCC Practical Nursing Program has consistently placed its graduates throughout the St. Cloud area and Minnesota.

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<td>BLGY2330</td>
<td>Microbiology</td>
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<td>CMST2310</td>
<td>Interpersonal Communication</td>
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<td>OR CMST 1320</td>
<td>Intro to Communication Studies</td>
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<td>ENGL1302</td>
<td>Analytical Writing</td>
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<td>PSYC1304</td>
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* Applicant may only apply after successful completion of acceptance 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 general education course work.

* A minimum grade of “C” or better and a cumulative GPA of 2.5 or above in general education coursework is required to be considered for admission and must be maintained.

Technical Studies Semester I
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<td>Nursing Skills</td>
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Technical Studies Semester II
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<td>PRSG2429</td>
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Technical Studies Semester III
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Technical Studies Semester IV
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Technical Studies Semester V
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>PRSG2410</td>
<td>Advanced Nursing Role Concepts</td>
<td>3</td>
</tr>
<tr>
<td>PRSG2440</td>
<td>Clinical Application II</td>
<td>5</td>
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</tbody>
</table>

Estimated cost of books, supplies and materials: $3500

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Practical Nursing
*Practical Nursing-Part-Time Diploma (42 Credits)*

Program Description
Practical Nursing is a challenging, meaningful, and fulfilling career with the benefits of intellectual stimulation, attractive earning potential, personal rewards, and excitement! 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. We are very proud of the college’s state-of-the-art nursing simulation lab that allows for the integration of instruction and clinical practice.

The program exists to educate and prepare individuals to complete the National Council Licensure Exam (NCLEX-PN), and to encourage individuals to engage in lifelong learning; continued learning is essential in a society that seeks well-trained healthcare workers for the benefit of patient health, quality of life and the well-being of the community. All program Core requirements must be completed at SCTCC. Students may be admitted to the Nursing Program only two times.

Admission to the program is highly competitive and requires the student to attend a pre-program informational session. Admittance requirements are subject to change, please view the website for up-to-date information. For consideration into the nursing program, students must have completed all prerequisite courses with a minimum GPA of 2.5 or above.

A graduate of the Practical Nursing Diploma program provides a foundation for career mobility with associate of applied science in practical nursing then on to associate or baccalaureate RN programs.

The Practical Nursing program is accredited by the Minnesota State Board of Nursing.

Career Opportunities
Today we are finding businesses and occupations being laid off, however, health care continues to need highly qualified and competent workers. According to the latest projections from the U.S. Bureau of Labor Statistics published in the November 2009 Monthly Labor Review, more than 581,500 new nursing positions will be created through 2018 (a 22.2% increase), making nursing the nation’s top profession in terms of projected job growth. The SCTCC Practical Nursing Program has consistently placed its graduates throughout the St. Cloud area and Minnesota.

Technical Studies Prerequisites

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>HLTH1440</td>
<td>Medical Terminology</td>
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<tr>
<td>BLGY1320</td>
<td>Human Biology</td>
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<tr>
<td>ENGL1302</td>
<td>Analytical Writing</td>
<td>4</td>
</tr>
<tr>
<td>PSYC1304</td>
<td>Life Span Developmental Psychology</td>
<td>3</td>
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</table>

* THE FOLLOWING CERTIFICATIONS/REGISTRATIONS MUST BE CURRENT AND ON FILE PRIOR TO ADMISSION INTO THE PROGRAM -- CPR/AED Adult, Child and Infant (Health Care Provider Level) -- HLTH 1402 NA or verification of completion of a 75 hour NA course.

* Applicant may only apply after successful completion of acceptance requirements. In addition, students must have completed the Accuplacer with scores above the cutoff points for Practical Nursing or successful completion of equivalent General Education/General Studies course work.

* A minimum grade of “C” or better and a cumulative GPA of 2.5 or above in general education coursework is required to be considered for admission and must be maintained. General education coursework must be completed prior to admission to the program.

Technical Studies Semester I

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>PRSG2409</td>
<td>Basic Nursing Concepts</td>
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<tr>
<td>PRSG2419</td>
<td>Nursing Skills</td>
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Technical Studies Semester II

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<tr>
<td>PRSG2401</td>
<td>Medical Surgical Nursing I</td>
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<tr>
<td>PRSG2429</td>
<td>Essentials of Clinical Pharmacology</td>
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Technical Studies Semester III

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<td>PRSG2460</td>
<td>Mental Health Nursing</td>
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Technical Studies Semester IV

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<tr>
<td>PRSG2402</td>
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<tr>
<td>PRSG2450</td>
<td>Family Health Nursing</td>
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Technical Studies Semester V

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<tbody>
<tr>
<td>PRSG2410</td>
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</tr>
<tr>
<td>PRSG2440</td>
<td>Clinical Application II</td>
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</table>

Estimated cost of books, supplies and materials: $3000

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Public Welfare Financial Worker

Public Welfare Financial Worker AAS Degree (63 Credits)

Program Description
In the Public Welfare Financial Worker program, students learn the policies and procedures needed to determine initial and ongoing eligibility for public assistance programs. Students will learn to interact with individuals and families served by human service agencies. Students will also learn the computer system used by the Minnesota Department of Human Services and county human services agencies.

Career Opportunities
Students will be qualified to work for the Minnesota Department of Human Services and county human service agencies.

Technical Studies

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>BUSM1260</td>
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<td>BUSM1290</td>
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<td>CPTR1210</td>
<td>Introduction to Computers</td>
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<td>HUMS1230</td>
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<td>HC Policy for Families</td>
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<tr>
<td>HUMS1233</td>
<td>Work Support Programs</td>
<td>3</td>
</tr>
<tr>
<td>HUMS1241</td>
<td>HC Policy for Adults</td>
<td>4</td>
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<td>HUMS1242</td>
<td>Managing Cash Cases</td>
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<tr>
<td>HUMS1290</td>
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General Education

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<tr>
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<td>Introduction to Communication Studies</td>
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<tr>
<td>CRTK1300</td>
<td>Introduction to Critical Thinking</td>
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<td>DVRS1304</td>
<td>Diversity and Social Justice</td>
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Estimated cost of books, supplies and materials: $1,600

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Public Welfare Financial Worker

Public Welfare Financial Worker Diploma (42 Credits)

Program Description
In the Public Welfare Financial Worker program, students learn the policies and procedures needed to determine initial and ongoing eligibility for public assistance programs. Students will learn to interact with individuals and families served by human service agencies. Students will also learn the computer system used by the Minnesota Department of Human Services and county human services agencies.

Career Opportunities
Students will be qualified to work for the Minnesota Department of Human Services and county human service agencies.

Technical Studies

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<td>CRTK 1300</td>
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<td>DVRS1304</td>
<td>Diversity and Social Justice</td>
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<tr>
<td>ENGL1302</td>
<td>Analytical Writing</td>
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</table>

Estimated cost of books, supplies and materials: $1,600

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

Program Description

The Sales and Management field is one of the fastest growing, largest, and most diversified fields of employment. This degree 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 directly after graduation.

The program introduces students to a broad base of sales and management related knowledge and includes experiences and opportunities for students to network and make connections in the community while they attend classes. The AAS degree option also includes general education classes that broaden the student experience and are transferable to other colleges in the Minnesota State College and University system.

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 three semesters of supervised occupational experience that directly applies classroom learning to the workplace. This work experience broadens student’s knowledge and helps them successfully secure positions after graduation.

Students have the opportunity to participate in Delta Epsilon Chi (DEX), the collegiate division of DECA. DEX facilitates student’s connection of classroom skills training to real world application. Students in DEX also attend professional business conferences and competitions and participate in volunteerism and community networking activities.

Career Opportunities

Sales and Management AAS graduates are often employed as department managers, store managers, retail sales associates, hospitality managers, customer service representatives, supervisors, business-to-business salespeople, and owners of their own businesses. Graduates work in the areas of wholesale, industrial, and commercial sales, management, or marketing.

<table>
<thead>
<tr>
<th>Suggested Technical Studies Semester I</th>
<th>Suggested Technical Studies Semester IV</th>
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<tbody>
<tr>
<td>SAMG1200 Principles of Marketing ................. 3</td>
<td>SAMG1235 Supervised Occupational Experience .................. 2</td>
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<tr>
<td>SAMG1210 Customer Service/Sales Techniques ............. 3</td>
<td>SAMG2270 Human Resource Management ................. 3</td>
</tr>
<tr>
<td>SAMG1215 Principles of Management .................... 3</td>
<td>SAMG2276 Marketing Research ......................... 3</td>
</tr>
<tr>
<td>SAMG1225 Business Ethics and Law ...................... 3</td>
<td>SAMG2280 Sales Management ......................... 3</td>
</tr>
<tr>
<td>SAMG1240 Professional Self Development ................. 1</td>
<td>SAMG2285 Entrepreneurship/Small Business Management ...... 3</td>
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<tr>
<td>SAMG1245 Sales and Marketing Math .................... 3</td>
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<table>
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<tr>
<th>Suggested Technical Studies Semester II</th>
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<tbody>
<tr>
<td>CPTR1210 Introduction to Computers .......... 3</td>
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<tr>
<td>SAMG1220 Sales Promotion/Advertising ....... 3</td>
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<tr>
<td>SAMG1235 Supervised Occupational Experience .... 2</td>
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<tr>
<td>SAMG1240 Professional Self Development .......... 1</td>
</tr>
<tr>
<td>SAMG1250 Fundamentals of Sales Accounting ....... 3</td>
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<table>
<thead>
<tr>
<th>Suggested Technical Studies Semester III</th>
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</thead>
<tbody>
<tr>
<td>SAMG1235 Supervised Occupational Experience .......... 2</td>
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<tr>
<td>SAMG1240 Professional Self Development ......... 1</td>
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<tr>
<td>SAMG2245 Marketing Management ................. 3</td>
</tr>
<tr>
<td>SAMG2255 Applied Sales Strategies/Telemarketing .... 3</td>
</tr>
<tr>
<td>SAMG2260 Management Computer Applications ........ 3</td>
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</table>

General Education

MNTC Goal Area 1 Communications-Oral and Written ............... 6
MNTC Goal Area 5 History, Social and Behavioral Sciences ........ 3
MNTC Goal Area 6 Humanities and Fine Arts ......................... 3
General Education Electives ......................................... 6

Estimated cost of books, supplies and materials: $1,000

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

Sales And Management Diploma (63 Credits-pending)

Program Description
The Sales and Management field is one of the fastest growing, largest, and most diversified fields of employment. 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 three semesters of supervised occupational experience that directly applies classroom learning to the workplace. This work experience broadens students’ knowledge and helps them successfully secure positions after graduation.

Students have the opportunity to participate in Delta Epsilon Chi (DEX), the collegiate division of DECA. DEX facilitates student’s connection of classroom skills training to real world application. Students in DEX attend professional business conferences and competitions and participate in volunteerism and community networking activities.

Career Opportunities
Sales and Management 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
SAMG1200 Principles of Marketing ........................................ 3
SAMG1210 Customer Service/Sales Techniques .......................... 3
SAMG1215 Principles of Management ...................................... 3
SAMG1225 Business Ethics and Law ...................................... 3
SAMG1235 Supervised Occupational Experience ...................... 2
SAMG1245 Sales and Marketing Math .................................... 3

Suggested Technical Studies Semester II
BUSM1217 Business Communications .................................... 3
CPTR1210 Introduction to Computers ..................................... 3
SAMG1220 Sales Promotion/Advertising ................................ 3
SAMG1235 Supervised Occupational Experience ...................... 2
SAMG1240 Professional Self Development .............................. 1
SAMG1250 Fundamentals of Sales Accounting ...................... 3

Suggested Technical Studies Semester III
SAMG1235 Supervised Occupational Experience ...................... 2
SAMG1240 Professional Self Development .............................. 1
SAMG2245 Marketing Management ..................................... 3
SAMG2255 Applied Sales Strategies/Telemarketing ................ 3
SAMG2260 Management Computer Applications .................... 3

Suggested Technical Studies Semester IV
SAMG1240 Professional Self Development .............................. 1
SAMG2270 Human Resource Management ............................. 3
SAMG2276 Marketing Research ........................................... 3
SAMG2280 Sales Management ............................................. 3
SAMG2285 Entrepreneurship/Small Business Management .... 3

General Studies
ENGL1100 Writing for the Workplace .................................. 3
GBEH1300 Human Relations ............................................. 3

Estimated cost of books, supplies and materials: $1,000

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

The Sales and Management Associate program is designed for students seeking introductory sales and management knowledge and skills or to pair this knowledge base with a trade of their choice.

Students develop basic skills and understanding in selling, marketing, management styles and business applications including math, accounting, and communications. Courses include an emphasis in practical business related knowledge and hands-on learning. Students immediately apply course topics in a supervised occupational experience in a sales, customer service, marketing, or management related position.

Students have the opportunity to participate in Delta Epsilon Chi (DEX), the collegiate division of DECA. DEX facilitates student’s connection of classroom skills training to real world application. Students in DEX attend professional business conferences and competitions and participate in volunteerism and community networking activities.

Career Opportunities

Sales and Management Associate level (1-year diploma) graduates are often employed as customer service representatives, entry-level sales people, and entry-level retail, restaurant, and hospitality managers and supervisors. Students can also choose to continue their education by applying these courses to the Sales and Management diploma or AAS degree.

Suggested Technical Studies Semester I

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CPTR1210</td>
<td>Introduction to Computers</td>
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<tr>
<td>SAMG1200</td>
<td>Principles of Marketing</td>
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<td>SAMG1215</td>
<td>Principles of Management</td>
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<td>SAMG1220</td>
<td>Sales Promotion/Advertising</td>
<td>3</td>
</tr>
<tr>
<td>SAMG1225</td>
<td>Business Ethics and Law</td>
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Suggested Technical Studies Semester II

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<tr>
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<td>Customer Service/Sales Techniques</td>
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<tr>
<td>SAMG1235</td>
<td>Supervised Occupational Experience</td>
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General Studies

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<tr>
<td>GBEH1300</td>
<td>Human Relations</td>
<td>3</td>
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</tbody>
</table>

Estimated cost of books, supplies and materials: $1,000

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

The Sonography Program provides the student with academic study, laboratory and clinical experience. The clinical experience will affiliate the students with facilities located within the five state region and beyond during the clinical ultrasound internship courses. Sonography students will receive comprehensive training and experience performing scanning procedures in abdominal, superficial structures, gynecological and obstetrical ultrasound. Students will also receive training and experience in vascular ultrasound procedures. Diagnostic Medical Sonographers perform and analyze ultrasound images through the use of high frequency sound waves in a variety of medical settings.

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. This program is nationally accredited by the Commission on Accreditation of Allied Health Educational Programs (CAAHEP). 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.

Admission preference will be given to students who have completed the admission requirements with post secondary education and health care experience. Prior health experience is helpful. Applicants should be aware that this program has very rigorous technical and clinical courses where eye-hand coordination skills are required for scanning. Students must be able to communicate effectively when performing ultrasound examinations. Students must provide their own transportation to clinical facilities, as well as living arrangements.

Career Opportunities

Many students find jobs in hospitals, outpatient clinics and mobile services. Ultrasound equipment manufacturers also hire Sonographers to demonstrate and sell their products. Other job opportunities include supervising, managing, education and research.

Technical Studies Prerequisites

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>BLGY2310</td>
<td>Human Anatomy/Physiology I</td>
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<tr>
<td>BLGY2320</td>
<td>Human Anatomy/Physiology II</td>
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<tr>
<td>PHYS1300</td>
<td>General Physics</td>
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<tr>
<td>MATH1300</td>
<td>College Algebra</td>
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</table>

* 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
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<tr>
<td>DMSG1405</td>
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Suggested Technical Studies Semester II

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<td>Ultrasound Cross-Sectional Anatomy I</td>
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<tr>
<td>DMSG1404</td>
<td>Diagnostic Medical Sonography I</td>
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<tr>
<td>DMSG1406</td>
<td>Clinical Ultrasound Lab I</td>
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Suggested Technical Studies Semester III *Summer*

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<td>Clinical Ultrasound Internship I</td>
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Suggested Technical Studies Semester IV

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<tbody>
<tr>
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<tr>
<td>DMSG2404</td>
<td>Diagnostic Medical Sonography II</td>
<td>3</td>
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<td>DMSG2406</td>
<td>Clinical Ultrasound Lab II</td>
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Suggested Technical Studies Semester V

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<tr>
<td>DMSG2407</td>
<td>Sonography Board Reviews</td>
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<tr>
<td>DMSG2409</td>
<td>Clinical Ultrasound Internship II</td>
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Suggested Technical Studies Semester VI *May Term*

<table>
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<tr>
<td>DMSG2410</td>
<td>Clinical Ultrasound Internship III</td>
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Suggested Technical Studies Semester VII *Summer*

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<tbody>
<tr>
<td>DMSG2411</td>
<td>Clinical Ultrasound Internship IV</td>
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General Education

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<tr>
<th>Course Title</th>
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<tr>
<td>MNTC Goal Area 1 Communications-Oral</td>
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<tr>
<td>MNTC Goal Area 1 Communications--Written</td>
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<tr>
<td>MNTC Goal Area 6 Humanities</td>
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</table>

Estimated cost of books, supplies and materials: $3,500

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. Clinical experience is provided at area hospitals. This clinical experience includes the following surgical areas: general surgery, orthopedics, plastics, obstetrics, genitourinary, eye, ear, nose and throat, cardiovascular and neurological. Students also spend time in the instrument room, central supply, recovery room and with unit support personnel. Students may choose between a diploma and an AAS Degree. The general education courses taken in the AAS Degree option are transferable to a 4-year university.

A surgical technologist possesses expertise in the theory and application of sterile and septic 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. This profession does require some lifting. Students must maintain a “C” average in every class to enter clinical rotations. A physical examination is required prior to clinical practice. Students must have a current CPR for Health Care Providers Certificate prior to clinical experience.

Students will join the Association of Surgical Technologists and graduates of the Surgical Technology Program will be eligible to take the National Certification Examination. This program is nationally accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP).

Students must provide their own transportation to clinical facilities, as well as living arrangements.

**Career Opportunities**

Surgical Technologists are allied health professionals who are an integral part of the team of medical practitioners providing pre-operative, intra-operative, and post-operative surgical care to patients in a variety of settings. Jobs are available in small Minnesota communities, as well as the metro area and in various cities throughout the United States.

**Technical Studies Prerequisites**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>HLTH1440</td>
<td>Medical Terminology</td>
<td>1</td>
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<tr>
<td>BLGY2310</td>
<td>Human Anatomy/Physiology I</td>
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<tr>
<td>BLGY2320</td>
<td>Human Anatomy/Physiology II</td>
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<tr>
<td>CMST2310</td>
<td>Interpersonal Communication OR</td>
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<tr>
<td>CMST3320</td>
<td>Intro to Communication Studies</td>
<td>3</td>
</tr>
<tr>
<td>DVRS1304</td>
<td>Diversity and Social Justice OR</td>
<td></td>
</tr>
<tr>
<td>CRTK1300</td>
<td>Critical Thinking</td>
<td>3</td>
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<tr>
<td>Goal 1 Communications (Written)</td>
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<tr>
<td>General Education Elective.</td>
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</tbody>
</table>

* THE FOLLOWING CERTIFICATION MUST BE CURRENT AND ON FILE PRIOR TO ADMISSION INTO THE PROGRAM: CPR/AED Adult, Child and Infant (Healthcare Provider Level)

* All prerequisite courses must be completed with a grade of “C” or better prior to admission to the program.

**Suggested Technical Studies Semester I**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>SURG1400</td>
<td>Medical Microbiology</td>
<td>2</td>
</tr>
<tr>
<td>SURG1404</td>
<td>Surgical Pharmacology</td>
<td>2</td>
</tr>
<tr>
<td>SURG1420</td>
<td>Operating Room Techniques</td>
<td>3</td>
</tr>
<tr>
<td>SURG1424</td>
<td>Operating Room Techniques Lab</td>
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**Suggested Technical Studies Semester II**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>SURG1442</td>
<td>Surgical Procedures I</td>
<td>6</td>
</tr>
<tr>
<td>SURG1462</td>
<td>Operating Room Clinical Lab I</td>
<td>14</td>
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</table>

**Suggested Technical Studies Semester III**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SURG1443</td>
<td>Surgical Procedures II</td>
<td>1</td>
</tr>
<tr>
<td>SURG1463</td>
<td>O. R. Clinical Lab II</td>
<td>3</td>
</tr>
</tbody>
</table>

Estimated cost of books, supplies and materials: $3,500

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. Clinical experience is provided at area hospitals. This clinical experience includes the following surgical areas: general surgery, orthopedics, plastics, obstetrics, genitourinary, eye, ear, nose and throat, cardiovascular and neurological. Students also spend time in the instrument room, central supply, recovery room and with unit support personnel. Students may choose between a diploma and an AAS Degree. The general education courses taken in the AAS Degree option are transferable to a 4-year university.

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. This profession does require some lifting. Students must maintain a “C” average in every class to enter clinical rotations. A physical examination is required prior to clinical practice. Students must have a current CPR for Health Care Providers Certificate prior to clinical experience.

Students will join the Association of Surgical Technologists and graduates of the Surgical Technology Program will be eligible to take the National Certification Examination. This program is nationally accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP).

Students must provide their own transportation to clinical facilities, as well as living arrangements.

Career Opportunities
Surgical Technologists are allied health care professionals who are an integral part of the team of medical practitioners providing pre-operative, intra-operative and post-operative surgical care to patients in a variety of settings. Jobs are available in small Minnesota communities, as well as the metro area and in various cities throughout the United States.

Technical Studies Prerequisites
HLTH1440 Medical Terminology................................. 1
HLTH1444 Introductory Anatomy and Physiology........... 4
CMST2310 Interpersonal Communication OR
CMST1320 Intro to Communication Studies.................. 3
DVRS1304 Diversity and Social Justice OR
CRTK1300 Critical Thinking..................................... 3

* THE FOLLOWING CERTIFICATION MUST BE CURRENT AND ON FILE PRIOR TO ADMISSION INTO THE PROGRAM: CPR/AED Adult, Child and Infant (Healthcare Provider Level)

* All prerequisite courses must be completed with a grade of “C” or better prior to admission to the program.

Suggested Technical Studies Semester I
HLTH1484 Ethics for Health Careers............................ 3
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: $3,100

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
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. Good safety practices are stressed in lab situations as required in the metal working industry. Written and Fundamental tests will be done in accordance with the American Welding Society (AWS) SENSE curriculum and code books.

**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 a diploma.**

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. The opportunities are many and will vary with ability and skills that have been developed. Skilled welders have the satisfaction of knowing that their education can lead to a successful and rewarding future.

<table>
<thead>
<tr>
<th>Suggested Technical Studies Semester I</th>
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<tbody>
<tr>
<td>TECH1556 Basic Manual - Automated Machining</td>
<td>2</td>
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<tr>
<td>WELD1505 Arc Welding Processes I</td>
<td>5</td>
</tr>
<tr>
<td>WELD1515 Thermal Welding and Cutting Process</td>
<td>3</td>
</tr>
<tr>
<td>WELD1520 Metallurgy in Fabrication</td>
<td>3</td>
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<tr>
<td>WELD1529 Print Reading and Math Applications</td>
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<tr>
<th>Suggested Technical Studies Semester II</th>
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<tbody>
<tr>
<td>TECH1550 Basic CADD</td>
<td>2</td>
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<tr>
<td>WELD1533 Fabrication Print Reading</td>
<td>1</td>
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<tr>
<td>WELD1540 Arc Welding Processes II</td>
<td>6</td>
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<tr>
<td>WELD1545 Gas Tungsten Arc Welding</td>
<td>4</td>
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<tr>
<td>WELD1558 Fabrication, Inspection and Testing</td>
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<tr>
<th>General Studies</th>
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<tbody>
<tr>
<td>ENGL1100 Writing for the Workplace</td>
<td>3</td>
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<tr>
<td>GBEH1300 Human Relations</td>
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Estimated cost of books, supplies and materials: $1450.00

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

Water Environmental Technologies (WETT) is an environmental program geared toward protecting the world’s most precious resource; WATER. This program is designed to prepare students for a diverse employment market. Courses cover a variety of chemical, biological, physical and mechanical water and wastewater treatment processes and techniques being applied today. Instruction for this program is provided in well-equipped classrooms and laboratory facilities that are continuously upgraded. Classroom sites are located in St. Cloud at the main campus and also at a unique satellite location in Eden Prairie, Minnesota. Students have the choice of a metropolitan or out-state location for training to accommodate their lifestyles and employment needs. The Eden Prairie location utilizes both an active water and wastewater treatment plant as the classroom.

As guardians of our public water supplies, students will learn the complex processes of obtaining water from its source, to treatment through multiple purification processes, to distribution of safe water in order to maintain the facilities, identify and troubleshoot treatment problems, and devise solutions to those problems to ensure safe uncontaminated water is available to end users.

Students of this program are offered an AAS Degree or Diploma to meet their career objectives. Upon completion of either degree, successful students will be eligible to take the examinations for their State of Minnesota Water and Wastewater certifications. When students successfully pass the state exams they will receive Class D Water and Wastewater certificates, which are required to operate water and wastewater treatment facilities for both public and private entities.

Students may qualify for individual scholarships and extended internship opportunities while enrolled in the program. The Water Environment Technology program is accredited by the Minnesota Department of Health and the Minnesota Pollution Control Agency.

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.

Water Environment Technologies graduates will have the diverse opportunity to work locally or apply their skills in a global market for either public or private employers. The demand for trained operators is consistently growing in areas of municipal and privately owned facilities. The global concerns for a safe constant supply of drinking water makes this program very attractive to students looking for a meaningful, secure career with an endless variety of opportunities today and in the future.

Upon successful completion of the Water Environment Technologies program, 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>WETT1502</td>
<td>Basic Laboratory Skills</td>
<td>1</td>
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<tr>
<td>WETT1506</td>
<td>Introduction to Water/Wastewater Technology</td>
<td>3</td>
</tr>
<tr>
<td>WETT1510</td>
<td>Water/Wastewater Treatment Calibrations</td>
<td>2</td>
</tr>
<tr>
<td>WETT1514</td>
<td>Source Water Treatment and Development</td>
<td>4</td>
</tr>
<tr>
<td>WETT1518</td>
<td>Water Plant Operation I</td>
<td>3</td>
</tr>
<tr>
<td>WETT1526</td>
<td>Water Distribution Systems</td>
<td>3</td>
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<tr>
<td>WETT1530</td>
<td>Understanding OSHA Safety Regulations in the Industry</td>
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Suggested Technical Studies Semester II

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<tbody>
<tr>
<td>WETT1522</td>
<td>Water Plant Operation II</td>
<td>3</td>
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<tr>
<td>WETT1534</td>
<td>Wastewater Plant Operation I</td>
<td>3</td>
</tr>
<tr>
<td>WETT1538</td>
<td>Wastewater Plant Operations II</td>
<td>4</td>
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<tr>
<td>WETT1542</td>
<td>Wastewater Laboratory Procedures</td>
<td>3</td>
</tr>
<tr>
<td>WETT1554</td>
<td>Automated Control Systems</td>
<td>3</td>
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<tr>
<td>WETT1558</td>
<td>Understanding the EPA Part 503 Biosolids Rule</td>
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Suggested Technical Studies Semester III (May Term)

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<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>WETT1546</td>
<td>Collection and Disinfection Systems Operation</td>
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<tr>
<td>WETT1550</td>
<td>Strategic Enhancement for Success</td>
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Technical Electives

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General Education

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<tbody>
<tr>
<td></td>
<td>MNTC Goal area 1 Communications-Written</td>
<td>3</td>
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<tr>
<td></td>
<td>MNTC Goal Area 1 Communications-Oral</td>
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<tr>
<td></td>
<td>MNTC Goal Area 2, 5, 6, 7 or 8 Critical Thinking,</td>
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<td></td>
<td>Social Science, Humanities, Diversity, Global</td>
<td>6</td>
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<tr>
<td></td>
<td>Perspective</td>
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<tr>
<td></td>
<td>MNTC Goal Area 3, 4 or 10 Nat Science, Math, People</td>
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<tr>
<td></td>
<td>and Environment</td>
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<tr>
<td></td>
<td>General Education Electives from any goal area</td>
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Estimated cost of books, supplies and materials: $850
### Program Description

Water Environmental Technologies (WETT) is an environmental program geared toward protecting the world’s most precious resource: WATER. This program is designed to prepare students for a diverse employment market. Courses cover a variety of chemical, biological, physical and mechanical water and wastewater treatment processes and techniques being applied today. Instruction for this program is provided in well-equipped classrooms and laboratory facilities that are continuously upgraded. Classroom sites are located in St. Cloud at the main campus and also at a unique satellite location in Eden Prairie, Minnesota. Students have the choice of a metropolitan or out-state location for training to accommodate their lifestyles and employment needs. The Eden Prairie location utilizes both an active water and wastewater treatment plant as the classroom.

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### Suggested Technical Studies Semester I

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<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>WETT1502</td>
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<td>Water/Wastewater Treatment Calibrations</td>
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<td>WETT1514</td>
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</tr>
<tr>
<td>WETT1518</td>
<td>Water Plant Operation I</td>
<td>3</td>
</tr>
<tr>
<td>WETT1526</td>
<td>Water Distribution Systems</td>
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### Suggested Technical Studies Semester II

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<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>WETT1522</td>
<td>Water Plant Operation II</td>
<td>3</td>
</tr>
<tr>
<td>WETT1534</td>
<td>Wastewater Plant Operation I</td>
<td>3</td>
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<td>WETT1538</td>
<td>Wastewater Plant Operations II</td>
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<tr>
<td>WETT1542</td>
<td>Wastewater Laboratory Procedures</td>
<td>3</td>
</tr>
<tr>
<td>WETT1554</td>
<td>Automated Control Systems</td>
<td>3</td>
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### Suggested Technical Studies Semester III (May Term)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>WETT1546</td>
<td>Collection and Disinfection Systems Operation</td>
<td>3</td>
</tr>
<tr>
<td>WETT1550</td>
<td>Strategic Enhancement for Success</td>
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### General Education

<table>
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<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td></td>
<td>MNTC Goal 1 Communications-Oral or Written</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MNTC Goal Areas 2 through 10</td>
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Estimated cost of books, supplies and materials: $850

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 2301** Persuasion.......................... 3 Credits
- **CMST 2302** Small Group Communication........... 3 Credits
- **CMST 2310** Interpersonal Communication.......... 3 Credits
- **ENGL 1301** Technical Writing.................... 4 Credits
- **ENGL 1302** Analytical Writing.................. 4 Credits
- **ENGL 2302** Advanced Argument and Research Writing 3 Credits
- **ENGL 2310** Introduction to Creative Writing...... 3 Credits

### 2 - Critical Thinking (Goal Area 2)
- **CMST 2301** Persuasion.......................... 3 Credits
- **COMM 1330** Media and Social Issues............... 3 Credits
- **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 1315** Natural Resource Conservation....... 3 Credits
- **BLGY 1320** Human Biology........................ 4 Credits
- **BLGY 1325** Nutrition................................ 3 Credits
- **BLGY 1351** General Biology....................... 4 Credits
- **BLGY 2310** Human Anatomy/Physiology I........ 4 Credits
- **BLGY 2320** Human Anatomy/Physiology II....... 4 Credits
- **BLGY 2330** Microbiology.......................... 4 Credits
- **CHEM 1340** Introduction to General Chemistry... 4 Credits
- **CHEM 1341** Intro to Organic and Biochemistry... 4 Credits
- **CHEM 1342** Organic and Biological Chemistry.... 5 Credits
- **EASC 1310** Meteorology........................... 4 Credits
- **GEOL 1300** Geology............................... 4 Credits
- **PHYS 1300** General Physics....................... 4 Credits

### 4 - Mathematics (Goal Area 4)
- **MATH 1300** College Algebra........................ 3 Credits
- **MATH 1320** College Trigonometry.................. 2 Credits
- **MATH 1330** Cultural Mathematics.................. 3 Credits
- **MATH 1350** Introduction to Statistics............. 3 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 1320** Introduction to Macroeconomics........ 3 Credits
- **ECON 1330** Introduction to Microeconomics........ 3 Credits
- **GEOG 1300** World Regional Geography.............. 3 Credits
- **HIST 1310** American History Until 1877............ 3 Credits
- **HIST 1311** The United States Since 1877............ 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 2310** Abnormal Psychology................... 3 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** 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 1320** Beginning Drawing........................ 3 Credits
- **CRTK 1300** Introduction to Critical Thinking....... 3 Credits
- **ENGL 1321** Introduction to Modern Fiction.......... 3 Credits
- **ENGL 1322** Introduction to Literature.............. 3 Credits
- **ENGL 1330** American Literature About War......... 3 Credits
- **ENGL 1340** Introduction to Multicultural Literature 3 Credits
- **ENGL 1341** Introduction to Women’s Literature..... 3 Credits
- **ENGL 1342** Middle Eastern Literature.............. 3 Credits
- **ENGL 1345** Gender in Literature.................... 3 Credits
- **HUMN 1300** Introduction to the Humanities........ 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

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<td>Mosaic Fast Track</td>
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<td>MATH 0470</td>
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**PLEASE NOTE:** All program plans are preliminary and curriculum may change without notice.
Course Descriptions
(alphabetical by course number)

ABCT 1502 - Collision Welding and Cutting
With the construction of today’s vehicles, welding is an important part of auto body repair. This course covers basic welding, safety procedures, application for welding on steel and galvanized metals, introduction to metal arc welding, oxy-acetylene welding and cutting. Major emphasis is placed on MIG (Metal Inert Gas), and plasma cutting according to I-Car standards.
Course Outcomes:
* identify and perform safety procedures in welding
* perform oxy-acetylene welding and cutting
* perform MIG and TIG welding
* perform plasma cutting
(3 C: 1 lect/pres, 2 lab)

ABCT 1506 - Intro to Collision Repair
This course enables the student to work with power and hand tools used in the daily operation of an Autobody facility. Lab tasks will be performed on vehicles by removal of interior and exterior parts. Other tasks include reconditioning vehicles.
Course Outcomes:
* identify personal and shop safety
* perform personal and shop safety
* perform removal of interior and exterior parts of a vehicle
* perform reconditioning procedures on a vehicle
(4 C: 1 lect/pres, 3 lab)

ABCT 1510 - Collision Repair Lab I
The student will apply basic procedures on production type vehicles, according to NATEF and I-CAR standards.
Course Outcomes:
* perform metal roughing
* perform metal finishing
* perform plastic filling
* perform fiberglass repair
* perform corrosion repair
* perform corrosion panel replacement
Corequisite(s): ABCT1514
Prerequisite(s): ABCT1502, ABCT1506
(3 C: 0 lect/pres, 3 lab)

ABCT 1514 - Basic Collision Repair
In order to develop the basic skills of autobody repair, students will learn the fundamentals of metal straightening, rust repair, fiberglass repair, and attachment of trim and hardware. Students will learn to repair damaged vehicles to the priming stage according to NATEF and I-CAR standards.
Course Outcomes:
* identify types of auto body damage
* perform straightening techniques to damaged sheet metal
* identify and perform plastic filler usage
* perform fiberglass repair
* identify and perform corrosion protection to metal
(4 C: 2 lect/pres, 2 lab)

ABCT 1518 - Refinishing Lab I
This is a lab course in which students will apply procedures learned in ABCT 1522 Refinishing. Complete paint jobs will be done on project vehicles.
Course Outcomes:
* perform panel refinishing
* complete vehicle refinishing
* select various types of material to be used in refinishing
Corequisite(s): ABCT1522
(3 C: 0 lect/pres, 3 lab)

ABCT 1522 - Refinishing
This course is a lecture/lab that will enable a student to develop the basic skills in refinishing. It will be an introduction to the application of paint products, the use of equipment, computer paint mixing, safety and environment.
Course Outcomes:
* identify and perform refinishing safety
* perform surface preparation
* application of primers
* perform spray gun techniques
* perform complete paint jobs
Corequisite(s): ABCT1518
(4 C: 2 lect/pres, 2 lab)

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.
Course Outcomes:
* perform color matching and blending
* perform spot refinishing
* perform panel refinishing
Corequisite(s): ABCT1530
Prerequisite(s): ABCT1518, ABCT1522
(3 C: 0 lect/pres, 3 lab)

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 applications will be done on production projects.
Course Outcomes:
* identify and perform color matching problems
* identify and perform color tinting procedures
* identify and perform spot repair painting
* apply different types of topcoats
* perform interior and exterior cleaning of vehicle
Corequisite(s): ABCT1526
(3 C: 1 lect/pres, 2 lab)

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.
Course 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

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

**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. 

**Course 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-state 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)**

**ABCT 2502 - Estimating**

An estimate is a written guide to the repairs that will be performed on a vehicle. Instruction will include becoming familiar with the manuals, forms, and procedures used in writing estimates. Insurance procedures and customer relations will be examined. 

**Course Outcomes:**  
* interpret parts, diagrams and vehicle identification codes  
* calculate parts and labor prices, and materials cost  
* use collision estimating manuals to write estimates  
* interpret hand written and computer generated estimates  
* analyze damaged vehicles  
* discuss customer, insurance and shop owner issues  
* develop safe estimating practices  

**(2 C: 1 lect/pres, 1 lab)**

**ABCT 2507 - Electrical Systems**

Electrical components are often damaged as a result of a collision. In most cases the collision technician is responsible for completing the required repairs. The focus of this course will be diagnosing and repairing electrical malfunctions including SRS, power accessories, and lighting systems. 

**Course Outcomes:**  
* aim lamps using manual and computer aided equipment to meet MN DOT requirements  
* inspect and service interior and exterior vehicle wiring systems  
* use electrical test equipment to test voltage, resistance and amperage in an electrical circuit  
* demonstrate manufacturer’s recommendations for splicing, soldering and connector replacement  
* test, clean, inspect and recharge batteries  
* comply with SRS safety and service requirements  
* demonstrate use of wire diagrams  

**(2 C: 1 lect/pres, 1 lab)**

**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. You will identify, examine designs, use measuring equipment, and analyze damage to create repair plans that will be used to perform repairs. 

**Course Outcomes:**  
* identify unibody and frame designs and analyze types of damage  
* demonstrate teamwork  
* comply with personal and environmental safety practices  
* identify and repair high strength steel components  
* use collision repair manuals to analyze damage  
* use manual frame gauges and computer aided frame analysis equipment  
* identify the need for different anchoring methods  
* anchor and repair unibody and conventional frames  
* clean and maintain equipment and shop  

Corequisite(s): ABCT2518  
Prerequisite(s): ABCT1506, ABCT1514  

**(3 C: 1 lect/pres, 2 lab)**

**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. 

**Course 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)**

**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. 

**Course 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  

Corequisite(s): ABCT2510  

**(C: 0 lect/pres, 3 lab, -3 other)**

**ABCT 2522 - Structural Damage Repair**

With high strength steel, lighter sheet metal, and glass being used for structural support, today’s technician must fully understand how the automobile functions as a complete unit. Students will identify and perform repairs on structural components in accordance with industry standards. Course Outcomes:  
* 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 manufacturers or I-CAR installation procedures  
* replace seam sealers, foams, and corrosion protection materials  

Prerequisite(s): ABCT1502, ABCT1506, ABCT1514  

**(4 C: 2 lect/pres, 2 lab)**

**ABCT 2527 - Collision Repair Lab III**

This lab will run concurrent with ABCT 2522 Structural Repair. It allows students the necessary time to perform structural repairs. 

**Course Outcomes:**  
* prepare estimates of repairs  
* organize repair procedure/process  
* complete structural, non-structural and refinsh process according to ASE/ICAR standards  
* select and utilize the appropriate tools, supplies and equipment

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* manage repair process according to flat-rate standards
* perform shop safety and operations as outlined in the program requirements
(4 C: 0 lect/pres, 4 lab)

**ABCT 2531 - Mechanical Systems**

Suspension and other mechanical parts often become damaged as a result of an accident. Collision technicians must be able to identify and possibly repair this damage. In this course, students will perform minor repairs to these systems. Environmental concerns and other topics pertaining to mechanical repairs will be addressed.

Course Outcomes:
* create a system of inspecting, planning and performing suspension repairs and alignments on cars and light duty trucks
* determine cooling systems components, manufacturer’s service procedures and perform needed repairs
* complete brake component inspection and repairs using service manual recommended procedures
* identify, inspect, and make repairs to emissions systems
* comply with all manufacturers procedures when servicing, inspecting and working around Supplemental Restraint Systems
* comply with all safety and shop operations as outlined in the program requirements
(3 C: 1 lect/pres, 2 lab)

**ABCT 2534 - Collision Repair Lab IV**

In the collision industry attention to detail, accuracy, and use of time are highly prioritized attributes. With the aid of the instructor, students will choose projects that will enable them to have these skills in preparation for entering the workforce.

Course Outcomes:
* 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): ABCT1506, ABCT2518
(4 C: 0 lect/pres, 4 lab)

**ABCT 2542 - Supervised Internship**

Internships can help aid the students 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 sponsoring repair facility, instructor, and the student.

This is a variable course with credits 1-6.

Course Outcomes:
* 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 teamwork
( C: 0 lect/pres, 0 lab)

**ACCT 1204 - Fundamentals of Accounting I**

This course is designed to examine the parts of profit and loss statements, calculations, and formulas and how they relate to the effective operations of a business. The course includes basic accounting fundamentals, along with interpreting financial operating statements and methods to improve the profitability of the business.

Course Outcomes:
* understand basic accounting terminology and definitions
* understand accounting processes and procedures
* understand the use of ledgers and journals
* analyze financial statements to determine ROI (return on investment)
* analyze financial reports to determine profitability of the business
(2 C: 2 lect/pres, 0 lab)

**ACCT 1214 - Principles of Accounting I - Modified Course for Tech Prep**

This course is an introduction to the fundamental accounting concepts and principles used to analyze and record business transactions. Topics include accounting as an information system, measuring and recording business transactions, business income, adjusting entries, the accounting cycle, accounting for service businesses and merchandising operations, accounting systems, special purpose journals, accounting for cash, receivables, temporary investments and inventories.

Course Outcomes:
* analyze financial reports to determine profitability of the business
* analyze financial statements to determine ROI (return on investment)
* understand the use of ledgers and journals
* understand basic accounting terminology and definitions
* complete project vehicles to customer satisfaction
* perform adjusting entries and explain the matching concept and its relationship to accrual based accounting
* define inventory systems and apply perpetual inventory to accounting systems
* prepare and analyze the three basic financial statements
* explain GAAP and its implications on business transactions
* understand the role of accounting in business, including the types of business organization, business stakeholders, ethics in business and the overall profession of accounting
* explain the nature of internal controls
* understand the corporate form of organization, including the sources of equity, characteristics and classes of stock, effect of dividends
(4 C: 3 lect/pres, 1 lab)

**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.

Course Outcomes:
* analyze financial reports to determine profitability of the business
* identify and comply with personal safety practices
* complete project vehicles to customer satisfaction
* perform adjusting entries and explain the matching concept and its relationship to accrual based accounting
* define inventory systems and apply perpetual inventory to accounting systems
* prepare and analyze the three basic financial statements
* explain GAAP and its implications on business transactions
* understand the role of accounting in business, including the types of business organization, business stakeholders, ethics in business and the overall profession of accounting
* explain the nature of internal controls
* understand the corporate form of organization, including the sources of equity, characteristics and classes of stock, effect of dividends
(4 C: 3 lect/pres, 1 lab)

**ACCT 1216 - Accounting Principles II**

This course covers the analysis, from the preparer and user perspective of business transactions related to partnerships and corporations. Students will complete projects on internal control, financial analysis and the accounting cycle. Classroom discussion along with individual and group assignments are an integral part of this course.

Course Outcomes:
* understand the nature of internal controls
* prepare and analyze the three basic financial statements
* understand basic accounting terminology and definitions
* describe and apply basic accounting concepts and principles
* understand the basic accounting system for 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
* recognize the effects of income taxes and unusual income items on the financial statements
* understand and prepare a report on a publicly traded corporation in the areas of basic analytical procedures along with solvency and profitability analysis
Prerequisite(s): ACCT1215
(4 C: 3 lect/pres, 1 lab)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
ACCT 1217 - Cost Accounting I
This course covers cost accounting for materials, labor and factory overhead in a manufacturing entity for a job order cost system.
Course Outcomes:
* explain how a job order manufacturing firm is organized
* identify how accounting records and procedures are established to record, transfer, and summarize manufacturing costs
* determine where cost figures originated and identify the detailed procedures and records required to account for materials purchased and used
* establish internal control procedures for purchasing as well as for storing and issuing materials in order to safeguard the company’s investment in inventory
Prerequisite(s): ACCT1215 or concurrent registration
(4 C: 3 lect/pres, 1 lab)

ACCT 1218 - Computerized Accounting I
This course is an introduction to computerized accounting and Internet applications. Topics include computerized general ledger, payroll, accounts receivable, account payable, and business applications of the Internet.
Course Outcomes:
* setup and operate a computerized accounting general ledger software package, utilizing the general ledger, accounts payable, accounts receivable, payroll and fixed asset modules
* develop skills to utilize the Internet in common business transactions
Prerequisite(s): CPTR1210, ACCT1215 or concurrent registration
(3 C: 2 lect/pres, 1 lab)

ACCT 1219 - Spreadsheets-Microsoft Excel
This course covers the most recent versions of spreadsheet applications. Topics include document design and creation, format modifications, and advanced formulas and functions.
Course Outcomes:
* setup and modify spreadsheet application in a computerized environment
* solve problems
* forecast future needs
* forecast performance
* use advanced formulas and functions
Prerequisite(s): CPTR1210
(2 C: 1 lect/pres, 1 lab)

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.
Course Outcomes:
* have a working knowledge of state and federal payroll laws and regulations
* complete a detailed report for a simulated business
Prerequisite(s): ACCT1215
(2 C: 1 lect/pres, 1 lab)

ACCT 1280 - Accounting Internship
This will be available to students who have demonstrated readiness and willingness to work in an on-the-job situation. It usually will be a training culmination and an opportunity to apply the skills learned.
Course Outcomes:
* demonstrate written and verbal communication skills
* demonstrate critical thinking skills
* demonstrate punctuality and cooperation
* demonstrate work traits and job keeping skills
* display technical competence in accounting
* adhere to confidentiality policies and procedures
( C: 0 lect/pres, 0 lab)

ACCT 2219 - Computerized Accounting II
This course covers additional computerized accounting applications. Topics include payroll, income tax preparation, general ledger setup and maintenance, business presentations, and financial analysis. Computerized accounting simulation is utilized.
Course Outcomes:
* develop the practical knowledge and skills to help ensure success in computerized account applications encountered on entry-level jobs
* be aware of and utilize the practical business applications of spreadsheet software
* operate a computerized payroll system
* prepare effective computerized visual business presentations
* demonstrate mastery of the computer rather than having the computer dictate the students’ abilities
Prerequisite(s): ACCT1216, ACCT1217
(3 C: 2 lect/pres, 1 lab)

ACCT 2220 - 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.
Course 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 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)

ACCT 2227 - Intermediate Accounting II
A continuation of ACCT 2226 with an emphasis on accounting requirements and procedures that relate to equity financing, investing activities, leases, income tax, employee compensation, financial statement disclosures, earnings per share, accounting changes and error corrections, and financial statement analysis.
Course Outcomes:
* choose an inventory valuation method based on tradeoffs among income tax effects, bookkeeping costs, and the impact of the financial statements
* recognize and account for short-term and long-term debt obligations
* prepare a statement of stockholders’ equity
* account for acquisition and utilization of noncurrent operating assets
* account for purchase of debt and equity securities
* account for both capital and operating leases from the standpoint of the lessee and the lessor
* organize a systematic financial ratio analysis recognizing the impact that different accounting methods can have on the financial ratios of otherwise identical companies
Prerequisite(s): ACCT2226
(4 C: 3 lect/pres, 1 lab)

ACCT 2228 - Cost Accounting II/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 decision, budgeting, planning and control.
Course Outcomes:
* analyze, record, and post transactions reflecting the charging of costs of materi-

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ACCT 2230 - Income Tax I
This course focuses on federal individual income taxes. The student will learn the tax laws as they apply to individual income taxes, how to complete a variety of federal income tax forms, and how to approach the yearly filing of federal individual income taxes.

Course Outcomes:
* know and understand the current federal income tax laws as they apply to the individual income taxes
* be aware of the differences between individual income taxes and other types of taxes
* know how to complete form 1040 and most accompanying schedules
* apply the knowledge gained in a practical manner for tax planning and preparation
* know how federal individual income taxes relate to other business and individual financial matters

ACCT 2231 - Income Tax II
This course will provide the student with experience working with federal individual income taxes, Minnesota state income taxes, and other federal taxes (partnership, corporate, FICA, FUTA). The student will learn to use a computerized tax preparation program, and prepare various forms and schedules. The course will also focus on tax planning issues and the income tax system.

Course Outcomes:
* apply knowledge and understanding of the federal and state individual income tax laws by preparing individual income tax returns using a computerized tax preparation program
* know and understand partnership and corporation taxation
* know and understand how to calculate other federal taxes (FUTA, FICA, Nanny Tax)
* understand tax planning concepts and how to apply them

ACCT 2234 - Auditing
This course is a study of the methods and procedures used to verify the completeness and accuracy of accounting records. Topics include professional ethics, the audit process, nature of evidence, internal control, audit-sampling techniques, the audit examination, and audit reports.

Course Outcomes:
* understand the public accounting profession and the responsibilities of a public accountant
* understand how to review and select audit clients
* understand the various audit objectives and procedures that are required to perform a successful audit
* understand the various audit reports that may be filed based on the findings of the audit

Prerequisite(s): ACCT2226
(3 C: 2 lect/pres, 1 lab)

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 Accreditation in Accountancy, as offered by the Accreditation Council for Accountancy and Taxation.

Course 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)

ACCT 2236 - Government and Non-Profit Accounting
A study and application of fund accounting principles and procedures that apply to governmental entities and not-for-profit organizations with an emphasis on the application of recording and reporting economic information for these organizations. Students will complete both a non-profit project and a governmental accounting project along with various classroom group and individual assignments.

Course Outcomes:
* understand the concepts of non-profit accounting and resource flow versus profit based financial statements
* identify restricted, temporarily restricted and unrestricted contributions and net assets
* describe the purpose of the different governmental accounting funds
* record governmental transactions for appropriations, encumbrances, expenditures, estimated revenues and actual revenues
* prepare basic governmental and non profit financial statements

Prerequisite(s): ACCT1215
(2 C: 1 lect/pres, 1 lab)

ADMS 1202 - Keyboarding/Word Processing
Students will cover the basic formatting of business documents using word processing, spreadsheet, database, graphics, presentation, and e-mail applications. Students will design and generate letters, tables, memos, and reports using appropriate software. Students will continue the development of keyboarding speed, accuracy, and proofreading skills.

Course Outcomes:
* prepare letters, tables, memos, and reports in acceptable format using the Microsoft Office Suite
* apply appropriate formatting features when creating documents
* create tables using word processing features for column headings, number totals, cell alignment, and placement on the page
* prepare reports containing bulleted and numbered lists, footnote and endnote, and columnar formatting using word processing
* create e-mail documents using correct formatting
* utilize appropriate graphics in documents
* utilize presentation software applicable to documents
* utilize database software for mail merge
* build speed and accuracy techniques with skillbuilding program software

Prerequisite(s): BUSM1207
(3 C: 2 lect/pres, 1 lab)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
ADMS 1203 - Advanced Keyboarding/Word Processing Appl.
Students will learn the advanced features of word processing software and apply them to the business related activities. Students will improve their productivity by using efficient, time saving methods to produce documentation. The course includes a strong emphasis on office organization, communication and documenta-
tion.
Course Outcomes:
* develop advanced keyboarding techniques with emphasis on the touch method, accuracy and speed
* create a form document to be used with mail merge
* manage files by creating an efficient and effective file management structure
* create tables using advanced features such as themes, quick parts and formulas
* create, apply, modify, remove, rename and delete styles
* create fill-in business forms utilizing templates
* construct a report with citations, cover page, and reference page
* construct a table of contents, indexes, and table of authorities within a report
* validate track changes within business documents
* formulate text into outline format for reports or presentations
Prerequisite(s): ADMS1202 C grade; 35 wpm
(3 C: 2 lect/pres, 1 lab)

ADMS 1204 - Advanced Microsoft Office
Advanced Microsoft Office will introduce the intermediate and advanced features of MS Office. They will also require the advanced skills of Windows 98 and a solid foundation in the problem-solving and communication competencies so important in the contemporary workplace.
Course Outcomes:
* maintain worksheets in Excel using advanced formulas
* create PowerPoint presentations with advanced drawing and animation
* analyze data using queries and filters
* implement Report Wizards
* create various forms from databases
* share office skills and serve community by completing 15 hours of service learning
Prerequisite(s): CPTR1210
(3 C: 2 lect/pres, 1 lab)

ADMS 1205 - Advanced Keyboarding/Word Processing Appl.
This course will include basic filing and calculator skills. Students will be intro-
duced to the rules and procedures involved when storing documents using the A.R.M.A. rules. Alphabetic, numeric, and geographic systems will be studied. Students will develop speed and accuracy using the touch system for four basic arithmetic operations and solving business applications on the calculator. Students will identify skills and qualities necessary for administrative professionals.
Course Outcomes:
* apply A.R.M.A. filing rules to correspondence
* develop touch system addition, subtraction, multiplication and division skills
* identify the role and responsibility of the office professional
* recognize the importance of ethical behavior
* develop effective techniques to work with office callers
Corequisite(s): ADMS1202
(3 C: 2 lect/pres, 1 lab)

ADMS 1206 - Keyboard Speedbuilding
This course is designed for the student to increase keyboarding speed and im-
prove accuracy through personal goal setting and intensive practice work.
Course Outcomes:
* perform with correct posture techniques
* type for 5 minutes with 0-2 errors using the letter by letter technique
* type with rhythm
Prerequisite(s): ADMS1202
(1 C: 0 lect/pres, 1 lab)

ADMS 1207 - Office Procedures I
This course will include basic filing and calculator skills. Students will be intro-
duced to the rules and procedures involved when storing documents using the A.R.M.A. rules. Alphabetic, numeric, and geographic systems will be studied. Students will develop speed and accuracy using the touch system for four basic arithmetic operations and solving business applications on the calculator. Students will identify skills and qualities necessary for administrative professionals.
Course Outcomes:
* apply A.R.M.A. filing rules to correspondence
* develop touch system addition, subtraction, multiplication and division skills
* identify the role and responsibility of the office professional
* recognize the importance of ethical behavior
* develop effective techniques to work with office callers
Corequisite(s): ADMS1202
(3 C: 2 lect/pres, 1 lab)

ADMS 1208 - Office Procedures II
The course includes hands-on projects that represent the complex day to days skills/activities necessary to successfully manage in an office environment. A variety of other office administrative tasks including the use of advanced word processing, database and spreadsheet functions will be performed.
Course Outcomes:
* transcribe mailable documents using transcription equipment
* create block and modified block letters using special letter parts
* create professional documents including letters, memos and reports in block and modified block styles
* spell check and proofread all documents to produce a mailable document
* create and update an electronic calendar
* utilize standard office reference materials to assist with oral, written and non-
verbal skills
* create template documents for standard office communications
* develop researching and reporting skills by using reference materials and the Web
* exercise time management to prioritize and manage in a work environment
* create databases to manage office applications
Prerequisite(s): ADMS1207, ADMS1202
(3 C: 2 lect/pres, 1 lab)

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.
Course Outcomes:
* gain experiences in differing areas of Administrative Support through short internships, speakers, research, and presentations
* understand differences between the Administrative Support divisions of gen-
eral, 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)

ADMS 2210 - Administrative Support AAS Degree Internship
This is a cooperative work-study program that will be available to students who have demonstrated readiness and willingness to work in an on-the-job situation. It usually will be a training culmination and an opportunity to apply the skills learned.
Course Outcomes:
* demonstrate written communication skills
* demonstrate word processing skills
* demonstrate spreadsheet skills
* demonstrate initiative
* demonstrate dependability
* create successful working relationships
* follow prescribed procedures
* demonstrate cooperation
* demonstrate telephone use skills
( C: 0 lect/pres, 0 lab)

ADMS 2214 - Digital Publications
Students will develop digital communication skills to support work in a profes-
sional 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.
Course 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

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

ADVR 2240 - Administrative Office Management and Supervision
This course introduces current management principles, concepts, and organizational trends, in addition, also acknowledge that it’s everyone’s job to manage information systems, from the top executive to the receptionist. The course will provide a strong, management-based background using a humanistic approach for managing and supervision staff. The course will also include managing human resources, working with groups and teams, managing essential administrative services, and managing workplace systems and technology. Technological changes in the workplace demand that each employee be computer-oriented with knowledge of efficiency techniques relative to business systems.

Course Outcomes:
* ensure relevant organizational activities are designed to maximize individual and unit productivity
* provide effective management of the organization’s information
* develop effective work processes and procedures
* provide a satisfactory physical and mental working environment for the organization’s employees
* help define duties and responsibilities of employees assigned within the administrative management functional area
* develop satisfactory lines of communication among employees within the administrative management functional area and between these employees and employees in other areas within the organization
* help employees maintain a high level of work effectiveness
* enhance the effective supervision of personnel
* assure the efficient and proper use of specialized equipment

Prerequisite(s): ADMS1208 or ADMS1237 or CPTR1210, ADMS1202, ADMS1208, ADMS1240  (3 C: 3 lect/pres, 0 lab)

ADVR 1200 - Introduction to Advertising
Students will study the history of advertising, its social and legal impact as well as other aspects of the advertising industry. Sales Promotion will also be studied as an important part of the advertising and marketing industry.

Course Outcomes:
* understand the history of the marketing process locally and globally
* develop an understanding of the overall marketing process
* develop an understanding of advertising’s economic and societal impact
* understand different components found within the Advertising industry
* differentiate between fair use and the need for permission within the Advertising industry

Prerequisite(s): CPTR1210  (3 C: 4 lect/pres, 0 lab)

ADVR 1210 - Computer Design and Layout - Modified Course for Tech Prep
This course introduces students to the concepts and processes of graphic design. Students learn the fundamental principles of page layout and typography working on computers in bitmap, vector graphics, and page layout software. Using current industry standard software, students will learn essential design concepts and techniques used in desktop publishing. Students will be required to produce various types of design pieces using page layout software.

Course Outcomes:
* recognize design characteristics and determine their strengths and weaknesses
* compose typography with images and vector objects using the appropriate software
* proficiently layout a variety of computerized print documents
* import and create text with full control over textual styling, formatting and copyfitting
* 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

Course Outcomes:
* gain the skills necessary to create vector graphics for print and web
* gain the skills necessary to understand the role of object-oriented tools in the realm of design
* 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)

ADVR 1211 - Computer Design and Layout
This course introduces students to the concepts and processes of graphic design. Students learn the fundamental principles of page layout and typography working on computers in bitmap, vector graphics, and page layout software. Using current industry standard software, students will learn essential design concepts and techniques used in desktop publishing. Students will be required to produce various types of design pieces using page layout software.

Course Outcomes:
* recognize design characteristics and determine their strengths and weaknesses
* compose typography with images and vector objects using the appropriate software
* proficiently layout a variety of computerized print documents
* import and create text with full control over textual styling, formatting and copyfitting
* 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

Course Outcomes:
* differentiate among bitmap and vector graphics, and distinguish between strengths and appropriate uses
* proficiently layout a variety of computerized print documents
* import and create text with full control over textual styling, formatting and copyfitting

Course Outcomes:
* differentiate among bitmap and vector graphics, and distinguish between strengths and appropriate uses
* proficiently layout a variety of computerized print documents
* import and create text with full control over textual styling, formatting and copyfitting

Course Outcomes:
* recognize design characteristics and determine their strengths and weaknesses
* compose typography with images and vector objects using the appropriate software
* proficiently layout a variety of computerized print documents
* import and create text with full control over textual styling, formatting and copyfitting

Prerequisite(s): ADMS1208 or ADMS1237 or CPTR1210, ADMS1202, ADMS1208, ADMS1240  (3 C: 3 lect/pres, 0 lab)

ADVR 1214 - Drawing with the Computer - Modified Course for Tech Prep
Students will learn the functions of Adobe Illustrator, a vector-based Macintosh application, to create drawings, logos and other design projects. Basic grayscale scanning will be taught as it relates to creation of drawing templates. Design, drawing and color theory are taught as integral parts of this class.

Course 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
* develop effective work processes and procedures
* ensure relevant organizational activities are designed to maximize individual and unit productivity
* provide effective management of the organization’s information
* develop effective work processes and procedures
* provide a satisfactory physical and mental working environment for the organization’s employees
* help define duties and responsibilities of employees assigned within the administrative management functional area
* develop satisfactory lines of communication among employees within the administrative management functional area and between these employees and employees in other areas within the organization
* help employees maintain a high level of work effectiveness
* enhance the effective supervision of personnel
* assure the efficient and proper use of specialized equipment

ADVR 1216 - Drawing with the Computer
This course will introduce students to Adobe Illustrator, the industry-standard illustration program for creating vector-based print, multimedia and web graphics. Students will learn design theory and image creation. Students construct illustrations and prepare them for export to graphics software, to the Web, and for printing. This course will emphasize proficiency in Adobe Illustrator and understanding the role of object-oriented tools in the realm of design. Students gain the skills necessary to create vector graphics for print and web.

Course Outcomes:
* 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)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* create professional level vector-based drawings
* proficiently use drawing software and tools to complete Internet or print
  protect
* compose typography with images and vector objects using the software applica-
  tion
* 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

Course 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 sizes for different images 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 cre-
  ate special effects
- save and prepare images in 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

ADVR 1220 - Computer Imaging and Editing- Modified Course for Tech Prep

Using a leading image editing software application, students will learn to create
color corrections and special effects using photographic and computer generated
images. In addition, they will learn the functions of this application to create and
process images for various outputs, including print media, multimedia and web
images. The basics of scanning will be covered. Design and color theory are
 taught as integral parts of this class.

Course Outcomes:

- demonstrate effective use of HTML programming language basics
- apply basic rules of good design
- utilize skills in the use of web authoring software
- identify features and benefits of any product offering
- apply copywriting skills and techniques to a variety of messages for specific
  media
- develop, research, write, design and present an advertising campaign
- differentiate between fair use of existing materials and the need for permission

ADVR 1235 - Web Design Fundamentals

Web Site Fundamentals covers the creation and design of a web site. In this
course students will learn basic technologies that go into the construction of web
sites. This course is not intended to make the student a programmer, but to make
them comfortable with a basic knowledge of HTML, web editors, and associated
web design techniques.

Course 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 sizes for different images 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 cre-
  ate special effects
- save and prepare images in 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

ADVR 1240 - Multimedia for Web Design

Students will study the process of creating and designing a multimedia web
design using the Macromedia Flash MX software. Lessons will be covered
using the Official Macromedia Flash MX Training Manual. Conceptualization,
storyboarding and the production process will be covered through a lecture/lab
format using G4 Macintosh computers. Successful completion will result in an
interactive, Macromedia Flash MX multimedia web design project.

Prerequisite(s): ADVR1200, ADVR1230, ADVR2281

ADVR 1230 - Copywriting

Students will study copywriting techniques, copy research, creative strategies
and objectives. These principles are applied to a variety of media including print,
direct mail, television and radio, which will then be developed into an advertising
campaign. Students will learn how to discover the features and benefits of any
product offering. Additional focus on methods for clearly defining the message
and techniques for creating effective written pieces will be explored.

Course Outcomes:

- describe the history of copywriting locally and globally
- discuss the roles and responsibilities of the copywriter
- explain the unique copywriter/artist relationship
- discuss the importance of accurate, clear, informative copy
- identify features and benefits of any product offering
- compose attention-getting headlines and benefit-selling body copy that sells
- apply copywriting skills and techniques to a variety of messages for specific
  media
- develop, research, write, design and present an advertising campaign
- differentiate between fair use of existing materials and the need for permission

ADVR 1241 - Website Creation and Editing

This course is designed to instruct students in all aspects of basic website cre-
ation, including creation, management, and maintenance of websites. Emphasis
is placed on the full development cycle, from thumbnails and mockups through to
publishing and testing. This course guides students in developing necessary skills
for a finished, publishable product.

Course Outcomes:

- format and import text and text files in different colors, sizes, and styles
- prepare images and other media for use on web pages
- create and manage internal and external links throughout a site
- create templates, libraries, and style sheets to improve control
- develop clear navigation through site design and features
- control interactivity with forms and design elements
- understand team concepts through process development
- critical thinking and problem solving skills, both individually and with diverse
  groups of professionals

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
ADVR 1242 - Website Creation and Editing - Modified Course for Tech Prep
This course is designed to instruct students in combining visual layout tools with text based HTML editing features for the creation, management and maintenance of web sites. This course guides students toward developing necessary skills in designing and building web pages and combining them into a finished, publishable product.
Course Outcomes:
* develop an understanding of how different medias are purchased and why
* design and create an actual media plan replicating industry standards
* evaluate and discuss individual designs and the designs of others
* apply the elements and principles of design to create solutions to design problems
* recognize the importance of craft to the final execution of design projects

ADVR 1254 - Fundamentals of Design - Modified Tech Prep Course
This course introduces students to graphic design as a form of visual communication through the study of the elements and principles of design. Students will take a step-by-step approach to learn design basics, drawing skills, and color theory. Hands-on projects will be created using a variety of mediums. A special focus is placed on building student’s design skills and knowledge.
Course Outcomes:
* address basic problems in advertising graphic design
* demonstrate working knowledge of advertising drawing tools and techniques
* explain the importance of drawing to the visual creative process
* apply color use and theory as it pertains to advertising design
* utilize creativity and experimentation in design using the correct design steps
* identify and incorporate the elements and principles of design
* demonstrate ability to capture the attention of the target audience using design techniques
* describe how the concept of visual unity within a design is used to strengthen visual communication
* recognize the importance of craft to the final execution of design projects

ADVR 1255 - Fundamentals of Design
This course introduces students to graphic design as a form of visual communication through the study of the elements and principles of design. Students will take a step-by-step approach to learn design basics, drawing skills, and color theory. Hands-on projects will be created using a variety of mediums. A special focus is placed on building student’s design skills and knowledge.
Course Outcomes:
* address basic problems in advertising graphic design
* demonstrate working knowledge of advertising drawing tools and techniques
* explain the importance of drawing to the visual creative process
* apply color use and theory as it pertains to advertising design
* utilize creativity and experimentation in design using the correct design steps
* identify and incorporate the elements and principles of design
* demonstrate ability to capture the attention of the target audience using design techniques
* describe how the concept of visual unity within a design is used to strengthen visual communication
* recognize the importance of craft to the final execution of design projects

ADVR 1261 - Public Relations
Students will learn to identify the public relations and publicity functions often assigned to advertising personnel and apply these procedures and practices to business and community needs. Methods of crisis management and dealing with the media will be identified. Emphasis is placed on the development of persuasive, professional public relations writing skills and development of a comprehensive public relations campaign.
Course Outcomes:
* develop public relations and what constitutes news
* create public relations tools such as news releases, fact sheets and newsletters
* describe the impact of public relations on economic and societal environments
* develop, research, write, design, produce and present a public relations campaign
* identify other forms of public relations and their uses
* recognize the role of the media in public relations
* discuss the importance of ethical decision-making and social responsibility in public relations
* identify major influences that affect both organizational behaviors and their publics’ behavior
* construct a crisis management plan

ADVR 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 process 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.
Course Outcomes:
* apply the elements and principles of design to create solutions to design problems
* employ design techniques to a variety of mediums
* 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

ADVR 1267 - Media Research and Planning
Students will be presented with basic media research principles as they relate to today’s advertising industry and will practice advertising research methods. Students will also construct a “real life” media plan with the assistance of professional industry contacts.
Course Outcomes:
* understand the history of the media research and the planning process
* discuss the role and responsibilities of the media researcher
* design and create an actual media plan replicating industry standards
* understand different types of media found within the Advertising Industry
* develop an understanding of how different medias are purchased and why

ADVR 1271 - Web Design Project
This course is designed to challenge the web designer student during their last semester with a specialized web design experience exemplarily of industry standards. Each web design project is an individualized experience with a sponsoring business, professional or agency and their instructor. All project areas will be implemented, including arranging meetings, determining deadlines, creating flowcharts, design, production and presentation. Students will integrate knowledge of copywriting, design, research, and digital photography techniques into their project. Each project will include a finished web site for a local (fictionitious or real) company.
Course Outcomes:
* research potential business clients for web page design
* develop and implement all aspects of web design

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
ADVR 1290 - Printing for Designers
The student will gain a general knowledge of printing areas including electronic publishing, image generation, image assembly, preflighting, multipurposing documents, and press operation. This course is designed to provide students with the skills that will allow them to understand the printing processes and effectively communicate with graphic arts professionals regarding the proper creation and production of digital files.

Course Outcomes:
* demonstrate and execute organizational skills and time management
* apply appropriate use of color and typography on the web
* utilize appropriate software for creating websites, audio files, video files and graphics
* differentiate between fair use of existing materials and the need for permission

(2 C: 0 lect/pres, 0 lab)

ADVR 2200 - Commercial Illustration
Students are introduced to advertising studio techniques in pencil, ink, markers and paint. Emphasis is on the development of line, volume, texture, color, light and composition.

Course Outcomes:
* develop an understanding of the relationship between successful advertising and the appropriate use of illustration
* define artistic styles used in advertising illustration
* demonstrate the development procedures for illustration, showing knowledge of art mediums, papers and techniques
* encourage students to explore various illustration materials and techniques
* develop through numerous assignments a useful insight into how professional illustrators achieve different finishes and effects
* foster creativity and practical image experimentation in illustration

(3 C: 1 lect/pres, 2 lab)

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.

Course 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)

ADVR 2209 - Introduction to Photography - Modified Course for Tech Prep
This course will cover the fundamentals of photography to include the use and functions of a 35mm film camera and digital camera. Students will learn light metering, exposure controls and modes, depth of field, the purpose and creative use of various lenses, filters and flash. Students will also learn and apply photographic design, with increased perceptual awareness to create works of film and digital imagery. Studio lighting and techniques are covered with an emphasis on creative product shots for advertising purposes.

Course Outcomes:
* identify and operate film and digital cameras in various formats and exposure modes
* create images that demonstrate proficiency in using a variety of photographic techniques, and lighting methods
* demonstrate an ability to use the camera features, including ISO settings, white balance, light metering, modes, exposure compensation values, shutter priority, aperture priority and flash
* respond critically to photographic images to demonstrate an understanding of photographic composition and design terminology as related to the field of photography
* critically assess the influence of photographic images on society and related ethnic issues
* incorporate the use of editing tools and composites to an individual or a series of shots
* execute product shoots in the studio using creative lighting techniques
* examine the photographic industry and identify career opportunities

( C: 0 lect/pres, 0 lab)

ADVR 2210 - Introduction to Photography
This course will cover the fundamentals of photography to include the use and functions of a 35mm film camera and digital camera. Students will learn light metering, exposure controls and modes, depth of field, the purpose and creative use of various lenses, filters and flash. Students will also learn and apply photographic design, with increased perceptual awareness to create works of film and digital imagery. Studio lighting and techniques are covered with an emphasis on creative product shots for advertising purposes.

Course Outcomes:
* identify and operate film and digital cameras in various formats and exposure modes
* create images that demonstrate proficiency in using a variety of photographic techniques and lighting methods
* demonstrate an ability to use features of camera features including ISO settings, white balance, light metering, modes, exposure compensation values, shutter priority, aperture priority and flash
* respond critically to photographic images to demonstrate an understanding of photographic composition and design terminology as related to the field of photography
* critically assess the influence of photographic images on society and related ethnic issues
* incorporate the use of editing tools and composites to an individual or a series of shots
* execute product shoots in the studio using creative lighting techniques
* examine the photographic industry and identify career opportunities

( C: 0 lect/pres, 0 lab)

ADVR 2240 - The Northway Group
This course is designed to challenge the serious Advertising Communications and Design student with a purposeful, specialized occupational experience in the advertising field through participation in “The Northway Group”. Each Agency project is an individualized student experience with a sponsoring nonprofit business, organization, or professional and their instructor. Each student is assigned roles in agency projects based upon their skill set and experience. Students will then apply their knowledge of advertising, writing, design, research, photography, computer software and production techniques to complete a series of projects that will closely simulate agency work experience.

Course Outcomes:
* research potential nonprofit clients for advertising related needs
* coordinate and implement all agency functions (i.e. arrange meetings, determine deadlines, oversee production, update business contact and instructor)
* develop time management, critical thinking, problem solving and written communication skills
* work with clients to help them identify their current problems and opportunities

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
ADVR 2255 - Internship
Students gain “real-life” internship experience with an industry related company. Instructor supervision and critique is a critical element of the internship experience. The learned principles are then applied to various areas studied of the Advertising industry for future employment. This is an excellent way to "Beef Up" your resume and polish your skills! This is a variable credit course, with credits 1-6.
Course Outcomes:
* identify the types of customers an Advertising Agency performs services for
* identify the procedures for documenting services performed for customers
* understand the daily workings of a commercial Advertising Agency
* demonstrate dependability
* create successful working relationships
(3 C: 2 lect/pres, 0 lab)

ADVR 2250 - Retail Advertising
Students will learn the fundamentals of national and local retail operations with emphasis on promotion and advertising. 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 advertising materials for a variety of media.
Course Outcomes:
* define the history of the retailing process locally and globally
* describe the overall retailing process and factors that affect retail advertising decisions
* recognize the impact of retailing on economic and societal environments
* describe the future of retailing in the 21st Century including trends, activities, and target audiences
* create and produce retail advertising materials such as tabloids and newspaper advertising
* evaluate legal and ethical issues as they relate to retailing
* identify Mass Merchandisers and their advertising strategies
* discuss retail customer relationship management
* identify and incorporate the promotional mix in retail advertising materials
* differentiate between fair use of existing materials and the need for permission
(3 C: 2 lect/pres, 1 lab)

ADVR 2260 - Advertising Campaign Development
Students will study three types of advertising objectives: selling, behavioral effects and communications. Students will examine benefits and problem solutions as related to an advertising campaign. Also, there are challenges to create: art, copy, music and strategy for a complete, integrated advertising campaign.
Course Outcomes:
* understand the mission and function of an advertising agency
* introduction to the idea of brands
* understand consumers and their relationships to brands
* elements of an effective campaign
* issues in campaign management
* develop a PlansBook for the assigned advertising campaign
Prerequisite(s): ADVR1200, ADVR1270, ADVR1211
(4 C: 3 lect/pres, 1 lab)

ADVR 2270 - Advertising Campaign Management Seminar
Selected students will participate in the organization of a working team specifically for the purpose of competing in the American Federation’s National Student Advertising Campaign, (NSAC). Students will be presented with a marketing challenge developed for this effort in conjunction with a major corporation. (Examples include: Toyota USA, The New York Times, etc.) Students will research all aspects of the challenge and its relevant markets, audiences, time, etc. The team will then resynthesize, evaluate and develop a comprehensive marketing plan, including all tactical elements used in said plan - advertising, media, sales promotion, public relations support, etc. In addition, students will develop, write, design and produce a comprehensive campaign plans book, along with a professional multi-media campaign presentation, which will be debated at the upper Midwest regional competition of the NSAC. This is a focused and intense learning experience that leverages all theoretical classroom learning as students become immersed in the complexities of a real-world marketing challenge.
Course Outcomes:
* analyze and effectively respond to specific market challenges, while performing within the parameters of stringent competition guidelines
* develop a comprehensive research report used to establish a balanced, informed perspective on the relevant target market(s), competition, business trends, economic trends, etc:
* understand and apply the creative and management processes used to develop effective campaigns
* create the elements of an effective advertising campaign for AdFed competition, including the development and execution of all strategies required in the development of that campaign
* understand the mission and function of an advertising agency resulting in the ability to successfully perform as a professional in this or similar corporate setting
* think critically and evaluate ad campaign materials/team performance
* develop and apply business skills used to manage people and projects like budget management and project development and presenting
Prerequisite(s): ADVR1200, ADVR1230, ADVR1261, ADVR1270
(3 C: 2 lect/pres, 1 lab)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
ADVR 2295 - Multimedia/Director
Students will study the process of creating and designing professional quality multimedia presentation using the Macromedia Director Software. Lingo and Basic Lessons will be covered using the Official Macromedia Director Training Manual, Conceptualization, storyboarding and the production process will be covered through a lecture/lab format using G4 Macintosh Computers. Successful completion will result in creating a professional, interactive, Macromedia Director project exemplary of industry standards.
Course Outcomes:
* document the history of the interactive video production process
* research the current commercial creation and production processes
* create a ten minute interactive presentation complete with a matching web page design
* compile the different components found within the multimedia industry
* differentiate between fair use and the need for permission
Prerequisite(s): ADVR1211, ADVR1221
(4 C: 2 lect/pres, 2 lab)

ANTH 1300 - Introduction to Cultural Anthropology
Meets MN Transfer Goals 5 and 8 - History/Social, Behavioral Sciences and Global Perspective. Students will learn and apply anthropology concepts and methods as tools for self-understanding, and for understanding others. The course will focus on ways anthropology can be applied to workplace cultures and to understanding the world we live in.
Course Outcomes:
* understand and be able to explain basic anthropology concepts and methods
* identify and describe contributions made by the sub-fields of anthropology
* apply anthropology concepts and methods to better understand their home and work situations
* become more aware of the diversity of the human experience
* identify and describe different patterns of subsistence, and the ways they are affected by change
* understand and be able to explain how the various aspects of a culture are integrated
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

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.
Course 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

ARCH 1502 - Introduction to Architectural Drafting
The student will learn how to use drafting tools, develop preliminary plans, design and sketch preliminary plans for a storage building, a one story home, and a two-story home.
Course Outcomes:
* use architectural lettering for labeling of sketches and preliminary drawings
* use correct architectural line styles and weights on sketches and preliminary drawings
* demonstrate knowledge of building materials and construction methods by sketching and labeling residential wall sections and building sections
* plan kitchens, living areas, bedrooms, closets, hallways, stairs, and bathrooms appropriate for traffic flow and furniture space needs
* design homes which are appropriate for size restrictions determined from customer’s budget
* plan and design homes of a correct size and orientation to meet the space and orientation of the land on which the home is to be built
(3 C: 1 lect/pres, 2 lab)

ARCH 1505 - Intro to Architectural CAD - Modified Course for Tech Prep
This computer-aided drafting course will include beginning graphic communication using basic computer skills/application. The student will work with AutoCAD or comparable CAD software to create drawings and learn “tools” of CAD: organizing, editing, drawing skills, printing/plotting, adding text and dimensions.
Course Outcomes:
* development of CAD operations skills and knowledge of the capabilities and potential of a CAD system
( C: 0 lect/pres, 0 lab)

ARCH 1506 - Intro to Architectural CAD
This computer-aided drafting will include beginning graphic communication using basic computer skills/applications. The student will work with AutoCAD software to create drawings, learn “tools” of the cad, organizing, editing, drawing skills, printing/plotting, adding text and dimensions.
Course Outcomes:
* development of CAD operational skills and knowledge of the capabilities and potential of a CAD System
Corequisite(s): ARCH1502
(3 C: 1 lect/pres, 2 lab)

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.
Course Outcomes:
* develop drafting skills including sketching of floor plans, sections and elevations
* complete a full set of CAD drawings for the construction of the home
Prerequisite(s): ARCH1502, ARCH1506, ARCH1534
(6 C: 2 lect/pres, 4 lab)

ARCH 1513 - Estimating and Construction Fundamentals I - Modified Course for Tech Prep
This course will give the student the basics of construction practices, techniques, estimating and construction problem solving. The excavation, footings, foundations, floor framing, wall framing, and roof framing of residential building will be emphasized. The uniform building code and regulations will be the benchmark. Some writing and class participation are required.
Course Outcomes:
* develop skills and examine building systems, estimate and do construction problem solving
* excavations, footings, foundations, floor framing, wall framing and roof framing of residential buildings will be emphasized
( C: 0 lect/pres, 0 lab)

ARCH 1514 - Estimating and Construction Fundamentals I
This course will give the student the basics of construction practices, techniques, estimating and construction problem solving. The excavation, footings, foundations, floor framing, wall framing, roof framing of residential building will be emphasized. The uniform code and regulations will be the benchmark. Some writing and class participation are required.
Course Outcomes:
* develop skills and examine building systems, estimate and do construction
problem solving
* excavation, footings, foundations, floor framing, wall framing, and roof framing of residential buildings will be emphasized
* current code and regulations will be the benchmark
* some writing and class participation are required

(3 C: 1 lect/pres, 2 lab)

ARCH 1518 - Estimating and Construction Fundamentals II
This course will give the pupil basics of construction practices, techniques, estimating and construction problem solving. The interior finishes, roof systems, stairways, fireplaces, thermal, moisture, and ventilation of residential building will be emphasized. The uniform building code and regulations will be the benchmark. Some writing and class participation are required.

Course Outcomes:
* learn materials and methods of completing a house, estimating the outside shell and solving basic construction problems
Prerequisite(s): ARCH1514
(3 C: 1 lect/pres, 2 lab)

ARCH 1522 - Residential Design Principles
Students will learn individual room design, placement of rooms on the floor plan, architectural history of house styles and criteria to determine good exterior and interior principles of design.

Course Outcomes:
* examine and identify the living, sleeping, and service areas of a home and the importance of traffic flow
* identify the various styles of kitchens and design kitchen layouts using the principles of customer needs
* determine the space requirements for living and dining areas based on furniture sizes, people needs, and traffic flow
* plan bedrooms, closets, and bathrooms for people and furniture space needs
* design outdoor living spaces such as decks and also be able to use code span tables to assure correct structural properties
* plan and design service areas such as stairways, laundry rooms, and garages

(2 C: 2 lect/ pres, 0 lab)

ARCH 1526 - Residential Materials and Methods I
Students will learn the use of building materials such as, concrete, windows, doors, lumber and wood products. Also the principles of reading residential blueprints.

Course Outcomes:
* interpret two dimensional drawings from three dimensional objects
* identify various building materials and parts of a house using the correct industry terms
* select materials for correct use based on their compliance with applicable building codes and industry practices
* interpret the information presented on residential prints
* examine the manufacturing, environmental issues, social impacts, and the distribution processes of various building materials

(2 C: 1 lect/ pres, 1 lab)

ARCH 1530 - Residential Materials and Methods II
Students will learn the use of building materials for residential construction, such as concrete blocks, bricks, stones, heating systems, solar systems, and architectural history.

Course Outcomes:
* identify various building materials
* select materials for correct use based on their compliance with applicable building codes
* examine the manufacturing, environmental issues, social impacts, and the distribution processes of various building materials
* examine the advantages and disadvantages of various kinds of residential heating systems
* examine current use and economics of solar systems in residential construction
* examine the history of architecture and its impact on today’s building materials and structural systems
Prerequisite(s): ARCH1526
(2 C: 1 lect/ pres, 1 lab)

ARCH 1534 - Residential Design and Presentation
Students will study design principles, construction methods, and products that are involved in the kitchen and bath business. Basic graphic presentation techniques will assist the student in entering careers as kitchen and bath design/sales specialists. Students will produce a remodeled plan for an actual kitchen and bath of their choice. Skills in product selection, ordering, project pricing, customer relations, and contracts will also be developed.

Course Outcomes:
* develop an understanding of cabinet manufacturing, distribution, and sales
* demonstrate good kitchen planning principles in development of project
* select wood species, finish color, door style, counter top material and pull hardware for kitchen project
* draw 2-D and 3-D plans for a remodeled kitchen
* develop specification and contract form for remodeled kitchen
* demonstrate good bathroom planning in development of remodeled bathroom
Prerequisite(s): ARCH1502
(2 C: 2 lect/ pres, 0 lab)

ARCH 1554 - Architectural Design Studio I
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.

Course 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)

ARCH 1560 - 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 com-

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mmercial 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.

Course Outcomes:
* determine demolition and remodeled space requirements based on existing floor Course 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): ARCH1502
(3 C: 1 lect/pres, 2 lab)

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.
Course 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, fnd. 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)

ARCH 2514 - Architectural Design Studio II
This course will enable students to create presentation drawings that will help your customer and other concerned people understand proposed building projects. Preliminary drawings, perspectives, and enhanced elevations will be prepared.
Course Outcomes:
* determine and list preliminary design solutions for a small remodeled commercial building
* draw enhanced presentation floor plan for a small remodeled commercial building. Principles of shade,misc.entourage, and 1-point perspective will be used to develop drawing using AutoCad software
* draw enhanced presentation elevation for a small remodeled commercial building. Principles of shade, shadow, misc.,entourage, and 1-point perspective will be used to develop drawing using AutoCad software
* determine and list preliminary design solutions for a small commercial building
* draw enhanced presentation floor plan for a small commercial building. Principles of shade,/misc.,entourage, and 1-point perspective will be used to develop drawing using AutoCad software
* draw a 3 dimensional presentation view for a small commercial building. Principles of shade, shadow, misc. entourage, 2-point perspective and 3-D solid modeling will be used to develop drawing using AutoCad software and hand drawing techniques
Corequisite(s): ARCH2518
Prerequisite(s): ARCH1510, ARCH2506, ARCH2522
(3 C: 1 lect/pres, 2 lab)

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.
Course 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, fnd. 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): ARCH2514 Prerequisite(s): ARCH2510, ARCH2506
(3 C: 1 lect/pres, 2 lab)

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 Uniform Building Code. 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.
Course Outcomes:
* access and analyze accessibility requirements of the Americans with Disabilities Act and determine how they apply to commercial building design
* develop basic layouts for units in multi-family construction utilizing fire, sound, and other building code requirements
* define and develop basic layouts for merchandising facilities
* identify and interpret different types of drawings; including structural, architectural, mechanical and civil drawings
* read and interpret blueprints for small commercial buildings
* demonstrate an understanding of the CSI format
Prerequisite(s): ARCH1526
(2 C: 1 lect/pres, 1 lab)

ARCH 2526 - Construction Estimating Analysis I
This course will enable the students to estimate residential construction. Students will be required to apply piecework material takeoffs for woodframe construction. Emphasis is placed on accuracy of measurement, correct description of items, logical sequence of quantity takeoff and presentation of required building materials. Complete estimates for residential projects will be established.
Course Outcomes:
* develop organized notes and tables for estimating purposes
* select materials for correct use based on their compliance with applicable building codes
* establish material quantities with emphasis on related mathematics as it applies to residential and commercial construction
* demonstrate an understanding of the methods, procedures and accepted practices used in the construction of residential homes
* establish a systematic procedure for takeoff, listing, and pricing of materials for residential construction
Prerequisite(s): ARCH1518
(3 C: 1 lect/pres, 2 lab)

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.
Course 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

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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
* develop a sustainable design vocabulary based on industry terminology
* evaluate projects using the LEED Rating system

ARCH 2534 - Construction Management and Contracting
Students will be introduced to the principles of the construction industry, and the phases of the construction process. Students will examine management systems used in construction. Areas of study will include: project manager duties, contract documents, bid process, project scheduling, as well as materials and methods used in the industry.
Course Outcomes:
* relate each phase of construction to the construction process
* understand each delivery method of construction
* learn and understand contract documents and the commercial bid process
* learn, understand, and create schedules related to construction projects and industry
Prerequisite(s): ARCH2522, ARCH2526
(2 C: 2 lect/pres, 0 lab)

ARCH 2538 - Construction Estimating Analysis II
This course will introduce the student to commercial estimating concepts. Application of linear, square, and cubic measurements and their relationships to the estimating process will be studied. Timberline estimating software will be introduced and used for residential and commercial applications. The application of the Minnesota Energy Code in residential and commercial construction will be studied.
Course 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
* develop an understanding of the Minnesota Energy Code and how it applies to residential and commercial construction
Prerequisite(s): ARCH2526, ARCH2522
(2 C: 2 lect/pres, 0 lab)

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 they 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.
Course Outcomes:
* calculate footing sizes using building loads and soil bearing data
* identify and select pre-cast, pre-stressed concrete products
* identify and explain the procedures involved in post-tensioned concrete
* identify and explain procedures used in Cast-in-place concrete
* identify basic steel shapes and calculate W and S shaped beam sizes using building loads and load charts
* identify solid sawn lumber sizes and calculate beam sizes using building loads and WWPA span calculator
* identify engineered wood products (I-joist, LVL, PSL, roof and floor trusses). Calculate sizes for various engineered lumber products using building loads and manufacturers load charts
Prerequisite(s): ARCH1530
(3 C: 1 lect/pres, 2 lab)

ARCH 2550 - Professional Constructor Seminar
This course will enable students to prepare a resume, letters of application, and a portfolio. Students will also study and practice interviewing techniques and do oral presentations. Students will practice the behaviors, attitudes, and ethics expected of the constructor by society and the business world will also be studied. Business forms and laws pertaining to contractors and their customers will be studied.
Course Outcomes:
* 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
* prepare and deliver an oral presentation
* observe and present customer sales techniques

ART 1320 - Beginning Drawing
Meets MN Transfer Goal Area 6 - The Humanities/Fine Art. This course introduces students to the basic elements of 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.
Course 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 a 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

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.
Course 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

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* demonstrate effective use of resources including faculty, other students, reference materials, industry sources, and the Internet
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

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 intro-
tecture 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” exceedence experience making real observations (naked eye, binocular, and telescope) and
measurements. You will analyze the data from your measurements and observa-
tions and draw scientific conclusions from your analysis.
Course 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 astronomi-
cal 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, refer-
ence materials, industry sources, and the Internet
(1 C: 0 lect/pres, 1 lab)

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 suspen-
dion and steering systems.
Course Outcomes:
* identify and perform safety procedures relating to the automotive repair indus-
try
* 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,
optimization, 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 perfor-
mance level of entry level technicians
* develop pollution preventive procedures involving lubricants, parts and com-
ponents of steering and suspension systems and storage, disposal or recycling of
tires
Prerequisite(s): TRAN1502 or READ0304 or Appropriate Accuplacer Score.
(4 C: 1 lect/pres, 3 lab)

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, volt-
age and amperage. Students will learn about diodes, transistors and solid-state
devices. Lab work will give the student 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.
Course 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)

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.
Course 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, READ0304 or Appropriate Accuplacer Score.
(4 C: 2 lect/pres, 2 lab)

AUTO 1512 - Engine Repair Theory
This course will cover principles of operation and diagnosis of automotive
engines including construction, parts identification, engine disassembly and
reassembly procedures. Students will learn how to analyze the internal parts and
determine the necessary repairs.
Course Outcomes:
* identify engine components and their function
* analyze component wear and damage
* explain operation of engine systems
* diagnose cause of engine failure
Corequisite(s): AUTO1514
(2 C: 2 lect/pres, 0 lab)

AUTO 1514 - Engine Repair Lab
This course will be primarily lab work and will give the student hands-on experi-
ence in engine repair and diagnose engine failures. The student will identify
internal parts, perform wear measurements, rebuild cylinder heads and engine
block.

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Course Outcomes:
* remove and install engine from vehicle
* inspect and measure engine parts for wear
* disassemble and reassemble engine
* remove, repair, recondition or replace worn engine components
* follow manufacture rebuilding procedures and guidelines
* diagnose engine condition

Corequisite(s): AUTO1512

(4 C: 0 lect/pres, 4 lab)

**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.

Course 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)

**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.

Course 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)

**AUTO 1523 - Advanced Chassis Electrical**

Students will develop a fundamental understanding of vehicle electronic control units controlling Anti-locking brake, supplemental restraint, and tire pressure monitoring systems. Lab work consists of using scan tools for service, repair and diagnosis on these electronic/mechanical systems on late model vehicles. Students should be able to describe system operation and perform service in accordance with manufacturer’s procedures.

Course Outcomes:
* perform inspection procedures on ABS and SIR systems
* perform inspection procedures on TPM systems
* use 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)

**AUTO 2502 - Engine Performance I**

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.

Course 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, TRAN1516, TRAN1504

(4 C: 2 lect/pres, 2 lab)

**AUTO 2505 - Engine Performance II**

Students will develop skills servicing fuel systems and computer control systems. Lab work consists of typical service, repair and diagnosis procedures on fuel and computer systems on late model vehicles. Students should be able to describe system operation and perform fuel system service in accordance with manufacturer’s procedures. Students should be able to describe computer and sensor operation and perform computer system service in accordance with manufacturer’s procedures.

Course Outcomes:
* identify maintenance requirements and various inspection procedures on fuel systems on late model vehicles
* demonstrate job entry skill development when performing basic fuel system service
* use 4/5 exhaust gas analyzer
* perform a computerized engine test analysis
* perform computer components service and repairs
* perform a computerized fuel system 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
* document repairs on repair orders

Prerequisite(s): TRAN1502, TRAN1504, TRAN1516

(5 C: 3 lect/pres, 2 lab)

**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 study the theory of torque multiplication and division, applying it to all automotive and light truck applications. Operation 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.

Course Outcomes:
* identify and perform safety procedures relating to the automotive repair industry
* understand manual transmission/transaxle, transfer case and differential operation and design by applying basic principles of torque multiplication and division using gears
* analyze mechanical and electrical synchronization of two or more components and transfer of torque 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

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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, remanufacture and replace a manual transmission/transaxle and transfer case, overhaul differential
* develop pollution preventive procedures involving storage, disposal and recycling of fluids and parts

Prerequisite(s): TRAN1504, AUTO1509, TRAN1502 or AUTO1510
(7 C: 2 lect/pres, 5 lab)

**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 some driveability problems. In this course students will study and apply the operation, repair, diagnosis and overhaul of automatic transmissions and transaxles. Students will be exposed to the latest tools required to repair or overhaul them as well as the scan tools needed to diagnose them.

Course Outcomes:
* Identify and perform safety procedures relating to the automotive repair industry
* Understand automatic transmission and transaxle operation and design by applying basic hydraulic and electric/electronic theory to the principles of torque multiplication and division using gears
* 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
* Access and synthesize information using pressure gauges, DVOM and scan tools, air tests, road tests and reference material to diagnose transmissions/transaxle failures or problems
* Remove, remanufacture and replace an automatic transmission and transaxle
* Develop pollution preventive procedures involving storage, disposal or recycling of fluids and parts

Prerequisite(s): AUTO2506
(3 C: 1 lect/pres, 2 lab)

**AUTO 2512 - Driveline Repair**
This lab course offers the opportunity for students to advance further in the techniques and procedures of diagnosing and repairing driveline failures including automatic transmission and transaxle overhaul.

Course 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 while working at the performance level of an entry level technician
* Access and synthesize information in a timely manner, using pressure gauges, 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 at or below 150% of flat rate time
* 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
* Remove, remanufacture and replace a manual transmission/transaxle and transfer case at or below 150% of flat rate time
* Overhaul a differential at or below 150% of flat rate time
* Practice pollution preventive procedures involving storage, disposal or recycling of fluids and parts

Prerequisite(s): AUTO2511
(3 C: 0 lect/pres, 3 lab)

**AUTO 2516 - Automotive Heating and Air Conditioning**
This course covers the operation, testing and repairs of manual and automatic systems. The student will learn about vacuum, electronic controls and airflow distribution.

Course 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

Prerequisite(s): TRAN2514
(2 C: 0 lect/pres, 2 lab)

**AUTO 2520 - Engine Driveability**
Students will learn the basic systems approach to diagnosing engine performance problems. Lab work consists of using oscilloscopes, lab scopes, DVOM meters and scan tool usage when repairing engine performance problems on today’s vehicles. Students should be able to perform engine performance service in accordance with manufacturer’s procedures.

Course Outcomes:
* Interpret customer/vehicle complaint on late model vehicles
* Demonstrate job entry skills development when performing basic vehicle diagnosis
* Use 4/5 exhaust gas analyzer
* Perform a computerized scan analysis
* Use the systems approach to diagnosis
* Be aware of ethical practices as it relates to engine performance service procedures
* Exhibit automotive technician professionalism

Prerequisite(s): AUTO2502, AUTO2505 or AUTO2505, AUTO1522
(3 C: 1 lect/pres, 2 lab)

**AUTO 2523 - Advanced Electronic Systems**
Students will develop a fundamental understanding of vehicle electronic control units controlling automatic transmissions, automatic air conditioning and Data line systems. Lab work consists of using scan tools for service, repair and diagnosis on these electronic/mechanical systems on late model vehicles. Students should be able to describe operation and perform service in accordance with manufacturer’s procedures.

Course Outcomes:
* Perform inspection procedures on automatic transmission and automatic A/C systems
* Perform inspection procedures for data line communication systems
* Use 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
* Exhibit technician/mechanic professionalism

Prerequisite(s): TRAN1504, TRAN1516
(2 C: 1 lect/pres, 1 lab)

**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.

(3 C: 0 lect/pres, 0 lab)

**BLGY 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.

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Course 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 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(4 C: 3 lect/pres, 1 lab)

BLGY 1315 - Natural Resource Conservation
Meets MN Transfer Goal Area 3 - Natural Sciences
Meets MN Transfer Goal Area 10 - 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.

Course 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

BLGY 1320 - Human Biology
Meets MN Transfer Goal 3 - Natural Sciences

Organization and general function of the human body. Areas of study include human organization, support and movement, integration and coordination, maintenance of the body, body defenses, reproduction, and development.

Course Outcomes:
* identify important anatomical structures associated with the human body
* demonstrate an understanding of the basic physiological mechanisms associated with the human body and relate these processes to the maintenance of homeostasis
* discuss important disease conditions of the human body systems
* list steps to be taken for the care of the human body and the prevention of disease

Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(4 C: 4 lect/pres, 0 lab)

BLGY 1325 - Nutrition
Meets MN Transfer Goal Area 3 - Natural Sciences

This course provides an introduction to nutritional dietary requirements and their mechanism of digestion, absorption, and metabolism. It also addresses the principles of nutrition throughout the human life cycle, as well as diet modification necessitated by specific health problems. Other topics to be covered are weight control, eating disorders, drug-diet interactions, diet and disease, and current nutritional facts.

Course Outcomes:
* understand the digestion, absorption, transport, and metabolism of the macro and micro nutrients in the body
* assemble a collection of diet analysis tools and use them to assess a patient’s current diet and identify deficiencies and excesses
* integrate the role of nutrition in the student’s own life as well as the lives of others
* relate the results of a diet analysis to the patient’s goals and design strategies to meet these goals
* view themselves as capable of making sound nutritional decisions and educating others about the basics of nutrition
* gain confidence in their abilities to reason through new challenges in nutrition and develop appropriate solutions

Prerequisite(s): READ0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

BLGY 1351 - General Biology
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.

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): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(4 C: 2 lect/pres, 2 lab)

BLGY 2310 - Human Anatomy/Physiology I
Meets MN Transfer Goal 3 - Natural Sciences. This course covers the structure and metabolic activity of organ systems including integumentary, skeletal, muscular and nervous.

Course Outcomes:
* identify and locate tissues, organs and accessory structures of the integumentary, skeletal, muscular, and nervous systems in the human body

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* relate chemical activities of cells to the metabolic activities of the body
* describe the relationship between structure and function of the integumentary, skeletal, muscular, and nervous systems in the human body
* describe the relationship of abnormal function and conditions of disease and stress in the integumentary, skeletal, muscular and nervous systems in the human body
Prerequisite(s): BLGY1351 (4 C: 2 lect/pres, 2 lab)

BLGY 2320 - Human Anatomy/Physiology II
Meets MN Transfer Goal 3 - Natural Sciences. This course covers the structure and metabolic activity of organ systems including circulatory, respiratory, digestive, excretory, endocrine, and reproductive.
Course Outcomes:
* identify and locate tissues, organs and accessory structures of the circulatory, respiratory, digestive, excretory, endocrine, and reproductive systems in the human body
* relate chemical activities of cells to the metabolic activities of the body
* describe the relationship between structure and function of the circulatory, respiratory, digestive, excretory, endocrine, and reproductive systems in the human body
* describe the relationship of abnormal function and conditions of disease and stress in the circulatory, respiratory, digestive, excretory, endocrine, and reproductive systems in the human body
Prerequisite(s): BLGY1300 or BLGY2310 (4 C: 2 lect/pres, 2 lab)

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 microbiological 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.
Course 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 or BLGY1300 (4 C: 2 lect/pres, 2 lab)

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.
Course Outcomes:
* operate by touch the letter, number and symbol keys
* demonstrate proper typing technique
* type 25 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)

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.
Course 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)

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.
Course 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

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* develop communication skills that reflect high ethical standards
* utilize distance and collaborative technologies
(3 C: 3 lect/pres, 0 lab)

**BUSM 1230 - Microsoft Word**
This course instructs students in the theories and practical applications of Microsoft Word. Students will learn to create, edit, save and print simple business documents including letters, memos, reports, and table.
Course Outcomes:
* produce, edit, format, save and print documents
* enhance documents with Speller, Thesaurus, Grammar Checker, fonts and templates
* create multi-page documents with headers, footers, footnotes and endnotes
* prepare documents such as notices, announcements and memos
* enhance and improve letters by manipulating text
(2 C: 1 lect/pres, 1 lab)

**BUSM 1260 - Applied Business Mathematics/Calculators**
This course covers application of mathematics functions to the solution of business problems using a 10-key calculator. The touch method of calculator operation will be used with emphasis on speed and accuracy.
Course Outcomes:
* demonstrate entry level 10-key calculator operation skills
* identify and solve mathematical business calculations involving interest, percentages, inventory, depreciation, annuities, and corporate stocks and bonds
(3 C: 2 lect/pres, 1 lab)

**BUSM 1266 - Introduction to Business - Modified Tech Prep Course**
This course is designed to provide students with an overview of business functions in the United States. It will discuss the responsibilities of business to the economy, employees, environment and the government.
Course Outcomes:
* describe how to develop a business plan
* identify characteristics of sole proprietorships, partnerships and corporations
* understand ethical and social responsibilities of businesses
* identify macroeconomic and microeconomic factors that affect business
* identify levels of management and functions of each
* explain how firms can enhance job satisfaction using theories of motivation
(2 C: 0 lect/pres, 0 lab)

**BUSM 1267 - Introduction to Business**
This course is designed to provide students with an overview of business functions in the United States. It will discuss the responsibilities of business to the economy, employees, environment and the government.
Course Outcomes:
* describe how to develop a business plan
* identify characteristics of sole proprietorships, partnerships and corporations
* understand ethical and social responsibilities of businesses
* identify macroeconomic and microeconomic factors that affect business
* identify levels of management and functions of each
* explain how firms can enhance job satisfaction using theories of motivation
(2 C: 2 lect/pres, 0 lab)

**BUSM 1274 - Business Law - Modified Course for Tech Prep**
This course is an introduction to the principals of law as they apply to citizens and businesses. Topics include the court system, legal system, contracts, negotiable instruments, agency and employer/employee relationships.
Course Outcomes:
* define business law terms
* describe supremacy of law and identify sources of law
* describe criminal vs. tort law
* understand the nature and characteristics of contracts
* understand the different bankruptcy chapters
(2 C: 2 lect/pres, 0 lab)

**BUSM 1275 - Business Law**
This course is an introduction to the principles of law as they apply to citizens and businesses. Topics include the court system, legal system, contracts, negotiable instruments, agency and employer/employee relationships.
Course Outcomes:
* define business law terms
* describe supremacy of law and identify sources of law
* describe criminal vs. tort law
* understand the nature and characteristics of contracts
* understand the different bankruptcy chapters
(2 C: 0 lect/pres, 0 lab)

**BUSM 1290 - Job Seeking/Keeping Skills**
This course offers an individualized approach to developing job seeking and keeping skills. Students will create resumes, write job application letters, complete a job application form, and prepare for the employment interview. Consideration will also be given to critical attitudes needed for job keeping.
Course Outcomes:
* prepare personal resume
* write job application letter
* complete job application form
* apply job interviewing skills
* write thank you letter
(1 C: 1 lect/pres, 0 lab)

**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.
Course 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): ADM2240
(3 C: 3 lect/pres, 0 lab)

**CACE 1400 - Professional Relations in CACE Careers**
This course explores career opportunities for working with people in a variety of programs. This course also examines job requirements, duties, regulations, and issues, skills, and personal characteristics for becoming successful professionals in child and adult care and education.
Course Outcomes:

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* describe and examine job requirements, conduct standards, staff policies, and staff procedures
* examine DCFL Rule 2, Rule 3, Rule 8, and School-Age Child Care Guidelines
* examine and identify career opportunities, training opportunities, and job-related health concerns
* examine working conditions of CACE professionals
* compare and contrast: wages, benefits, and pay structures; working conditions; and program philosophies, missions, and goals
* describe positive collaborative relationships with colleagues, professionals, and families
* identify team roles, responsibilities and behaviors
* examine and discuss positive attitude, problem-solving skills, confidentiality, and communication
* identify and utilize professional literature, organizations, and resources

(3 C: 3 lect/pres, 0 lab)

**CACE 1401 - Professional Relations in CACE Careers - Modified course for Tech Prep**

This course explores career opportunities for working with people in a variety of programs. This course also examines job requirements, duties, regulations, and issues, skills, and personal characteristics for becoming successful professionals in child and adult care and education.

Course Outcomes:
* describe and examine job requirements, conduct standards, staff policies, and staff procedures
* examine DCFL rule 2, Rule 3, Rule 8, and School-age Child Care Guidelines
* examine and identify career opportunities, and job-related health concerns
* examine working conditions of CACE professionals
* compare and contrast: wages, benefits, and pay structures; working conditions; and program philosophies, missions, and goals
* describe positive collaborative relationships with colleagues, professionals, and families
* identify team roles, responsibilities, and behaviors
* examine and discuss positive attitude, problem-solving skills, confidentiality, and communication
* identify and utilize professional literature, organizations, and resources

(3 C: 3 lect/pres, 0 lab)

**CACE 1403 - Safety, Health and Nutrition - Modified Course for Tech Prep**

This course will guide the student in obtaining skills needed to establish and maintain a physically and psychologically safe and healthy learning 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.**

Course Outcomes:
* demonstrate universal health and hygiene procedures including hand washing, sanitation, diapering, and toileting
* describe safety practices such as fire, traffic, poison, accident and injury, natural disasters, and security
* describe policies and procedures regarding childhood illnesses and communicable diseases including immunizations and exclusion policies
* describe basic nutrition guidelines and meal planning for the various stages of growth and development
* become aware of the responsibilities of protecting children from physical, emotional, and sexual abuse and neglect
* identify community resources that assist in providing for the needs of children and their families
* identify personal, professional, and program risks and risk reduction strategies

Prerequisite(s): READ0304 or Appropriate Accuplacer Score.

(3 C: 3 lect/pres, 0 lab)

**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.**

Course Outcomes:
* demonstrate universal health and hygiene procedures including hand washing, sanitation, diapering, and toileting
* describe safety practices such as fire, traffic, poison, accident and injury, natural disasters, and security
* describe policies and procedures regarding childhood illnesses and communicable diseases including immunizations and exclusion policies
* describe basic nutrition guidelines and meal planning for the various stages of growth and development
* become aware of the indicators and responsibilities of protecting children from physical, emotional, and sexual abuse and neglect
* identify community resources that assist in providing for the needs of children and their families
* identify personal, professional, and program risks and risk reduction strategies

Prerequisite(s): READ0304 or Appropriate Accuplacer Score.

(3 C: 3 lect/pres, 0 lab)

**CACE 1419 - Foundations of Development - Modified Course for Tech Prep**

This course provides an overview of typical and atypical development across cultures, from prenatal through late adult, including physical, social/emotional, and cognitive development. It integrates developmental theory with appropriate practices in a variety of caregiving and education settings.

Course Outcomes:
* examine historical context and theoretical approaches in the study of human development
* summarize and compare the eight life span stages
* observe and record physical, cognitive, and social-emotional growth in each of the life span stages
* relate the stages of moral development of human growth and development
* relate the stages of language development to human growth and development
* examine cultural diversity as it applies to human development
* identify atypical development
* locate the community resources available to support people throughout the life span
* examine the process of death and dying across cultures

(3 C: 3 lect/pres, 0 lab)

**CACE 1420 - Foundations of Development**

This course provides an overview of typical and atypical development across cultures, from prenatal through late adult, including physical, social/emotional, and cognitive development. It integrates developmental theory with appropriate practices in a variety of caregiving and education settings.

Course Outcomes:
* examine historical context and theoretical approaches in the study of human development
* summarize and compare the eight life span stages
* observe and record physical, cognitive, and social-emotional growth in each of the life span stages
* relate the stages of moral development of human growth and development
* relate the stages of language development to human growth and development
* examine cultural diversity as it applies to human development
* identify atypical development
* locate the community resources available to support people throughout the life span
* examine the process of death and dying across cultures

Prerequisite(s): READ0304 or Appropriate Accuplacer Score.

(3 C: 3 lect/pres, 0 lab)

**PLEASE NOTE:** All program plans are preliminary and curriculum may change without notice.
CACE 1422 - Profiles of the Exceptional Child
This course provides an overview of a variety of disabilities and handicapping conditions that might affect a child’s growth and development. It provides caregiving and classroom strategies to promote inclusion of all children in their communities.

Course Outcomes:
* describe PL 94-142 and other pieces of historical legislation and relate them to current service models
* list characteristics of the categories of disabilities including learning disabilities, mental retardation, visual impairments, hearing loss, ADHD, communication disorders, physical disabilities and other health impairments, autism, emotional or behavioral disorder, severe and multiple disabilities
* examine the impact of a child with disabilities on the family and in the community
* create a personal philosophy regarding the issues of inclusion and least restrictive environment
* analyze and practice techniques for observing, recording, and assessing behavior
* create and/or modify activities to meet the unique needs of a child in the least restrictive environment
* examine the IFSP/IEP/ISP/IHP processes for providing services to children with disabilities
* utilize community agencies and other resources

Prerequisite(s): READ0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

CACE 1424 - School-Age Strategies for Learning
This course provides an overview of school-age theory and development in home or center-based settings. Students will integrate knowledge of developmental needs, developmentally appropriate environments, effective caregiving, teaching strategies and observation methods.

Course Outcomes:
* review and define developmental stages and characteristics of school age children
* examine and demonstrate techniques to identify and describe developmental characteristics of school age children through observation
* examine and implement learning experiences that will support and extend children’s development in all developmental areas
* develop and implement strategies and materials to meet the language, social, cognitive, and science developmental needs of school age children
* examine and describe the effects of the home environment on children
* describe families and examine antibias curriculums and environments

Prerequisite(s): READ0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

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.

Course 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): CACE1420, CACE1440
(3 C: 3 lect/pres, 0 lab)

CACE 1428 - Family and Community Relations
This course helps child care providers increase their understanding of diverse families and provides an opportunity to examine how current societal and community issues impact the development of children and the well-being of families. The changing role and structure of families will be explored. Other topics related to families include cultural diversity/dynamics, bias, public education, housing, employment, crime, health care, legal services, and social services.

Course Outcomes:
* examine family dynamics across the lifespan
* examine cultural dynamics and cultural diversity in child care practices
* examine the impact and effects of attitudes, prejudice and bias related to race, culture, age, sex, and socio-economic class
* examine social service systems, legal systems, and family support systems
* identify advocacy roles and responsibilities
* examine benefits of and barriers to teacher and family partnerships
* compile a community resource and services file

Prerequisite(s): READ0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

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. Emphasis on problem-prevention and positive guidance strategies; recognition, communication, limit setting, problem-solving.

Course Outcomes:
* identify and evaluate environmental influences on learning and behavior
* define and observe interest areas
* describe problem prevention strategies for the physical environment, the schedule, and the learning activities
* define guidance, discipline, and punishment; and assess personal guidance beliefs and assumptions
* describe the following problem prevention and guidance strategies: recognition, communication, limit setting, problem-solving, and behavior modification
* describe problem-solving techniques
* develop rules and expectations

Prerequisite(s): READ0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

CACE 1444 - Planning and Implementing Curriculum
This course examines the role of the teacher in early childhood settings. It applies the knowledge of child development as it relates to individual children, communities, curriculum and communication activities.

Course Outcomes:
* review development in the following areas: sensory-motor, cognitive, language, creative, and social-emotional
* examine developmentally appropriate practice as it relates to individual children, communities, and curriculum
* examine positive adult/child relationships
* describe and demonstrate positive communication techniques
* examine learning through play
* examine and demonstrate experiential learning through small and large group activities
* describe and demonstrate motivation strategies to enhance learning and participation
* examine and implement teaching strategies and learning experiences in the following areas: indoor/outdoor, language/literacy, mathematics, science, manipulatives/fine motor, social studies, block play, arts, music, drama, movement, computer, construction, sand/water, and media
* describe and demonstrate problem-solving techniques and critical thinking methods

Prerequisite(s): READ0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
CACE 1448 - Literature and Language Development Experiences
This course provides an overview of language and literacy learning experiences in either 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.
Course 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
* describe children’s literature and literacy
* examine picture books, non-fiction, fiction, fairy tales/folk tales, and poetry
Prerequisite(s): READ0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

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.
Course Outcomes:
* identify and perform health, safety, and nutrition skills
* observe, perform and evaluate child guidance skills
* arrange, evaluate, and manage interest areas
* observe and evaluate parent communication skills
* observe and evaluate growth and development in the areas of sensory-motor, cognitive, social-emotional, language, and creativity
* implement teaching strategies addressing growth and development in the areas of sensory-motor, cognitive, social-emotional, language, and creativity
* observe, practice, and evaluate one-on-one, small, and large group teaching strategies
* plan and implement daily routines and transitions
* develop and evaluate team building and professional relations skills
Prerequisite(s): CACE1400, CACE1420, EMSCI1404 or concurrent registration, MATH0380 or Appropriate Accuplacer Score. (3 C: 1 lect/pres, 0 lab, 2 other)

CACE 1464 - Internship II
This course provides an opportunity to apply knowledge and skill in caregiving and/or education settings. Students will observe and assess behavior, facilitate free choice activities, implement adult-oriented learning experiences, and maintain professional relationships.
Course Outcomes:
* observe children/adults in the following developmental areas: language, cognitive, social-emotional, sensory-motor, and creative
* determine learning experiences for the following developmental areas: language, cognitive, social-emotional, sensory-motor, and creative
* analyze experiences for cultural sensitivity and diversity in the following developmental areas: language, cognitive, social-emotional, sensory-motor, and creative
* integrate learning experiences into the daily or weekly schedule from the following developmental areas: language, cognitive, social-emotional, sensory-motor, and creative
* arrange learning environments for the following developmental areas: language, cognitive, social-emotional, sensory-motor, and creative
* implement learning experiences in the following developmental areas: language, cognitive, social-emotional, sensory-motor, and creative
* determine and demonstrate communication techniques appropriate for practitioners site, including the professional staff and the children/adults.
Prerequisite(s): CACE1400, CACE1420, CACE1404, CACE1440 or Appropriate Accuplacer Score. (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.
Course Outcomes:
* develop social skills and workplace ethics
* demonstrate civic responsibility
* create a portfolio/e-folio that will provide an effective transition from college to work
* demonstrate leadership skills
* prepare, revise, and rewrite a resume and cover letter
Prerequisite(s): READ0304 or Appropriate Accuplacer Score.
(1 C: 1 lect/pres, 0 lab)

CACE 1473 - Strategies in Reading for the Paraprofessional
This course combines an understanding of how children learn Reading and how to promote that learning by supporting the instruction of the classroom teacher.
Course Outcomes:
* describe and effectively use available resources (including technology) for supporting teacher instruction in the subject of Reading (examples include internet resources, instructional manuals, tangibles, colleagues, etc.)
* identify effective developmental, age-appropriate, and culturally sensitive instructional strategies in Reading that support the instruction of licensed teachers
* develop and implement recording 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
* define and understand how the Minnesota Standards and Testing (including state and local testing) direct the teaching of Reading in Minnesota
* develop strategies to support and reinforce the instruction of students in Reading following written and oral lesson plans developed by licensed teachers
* examine the use of technology in the learning and application of Reading
Prerequisite(s): READ0304 or Appropriate Accuplacer Score.
(2 C: 2 lect/pres, 0 lab)

CACE 1474 - Strategies in Math for Paraprofessionals
This course combines an understanding of how children learn Math and how to promote that learning by supporting the instruction of the classroom teacher.
Course Outcomes:
* develop the ability to access and effectively use available resources (including technology) for supporting teacher instruction in the subject of Math. (Examples include internet resources, instructional manuals, tangibles, colleagues, etc.)
* 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
* demonstrate the use of technology in the learning and application of Math
Prerequisite(s): MATH0480 or Appropriate Accuplacer Score.
(2 C: 2 lect/pres, 0 lab)

CACE 1476 - Writing Strategies for Paraprofessionals
This course combines an understanding of how children learn Writing and how to promote that learning by supporting the instruction of the classroom teacher.
Course Outcomes:
* gain the ability to access and effectively use available resources (including technology) for supporting teacher instruction in the subject of Writing (examples include internet resources, instructional manuals, tangibles, colleagues, etc.)
* develop effective developmental, age-appropriate, and culturally sensitive instructional strategies in Writing that support the instruction of licensed teachers

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* practice gathering and recording data regarding student performance in the area of Reading using tools such as rubrics, curriculum-based measurements, and informal assessments
* increase knowledge of terminology related to the instruction of Writing
* gain an understanding of how the Minnesota Standards and Testing (including state and local testing) direct the teaching of Writing in Minnesota
* develop strategies to support and reinforce the instruction of students in Writing following written and oral lesson plans developed by licensed teachers
* explore the use of technology in the learning and application of Writing (1 C: 1 lect/pres, 0 lab)

CACE 1478 - Technology Strategies for Paraprofessionals
This course combines an understanding of how children learn to use Technology and also Assistive/Augmentative Technology; and how to promote that learning by supporting the instruction of the classroom teacher.
Course Outcomes:
* gain the ability to access and effectively use available resources (including technology) for supporting teacher instruction in the subject of Technology (Examples include internet resources, instructional manuals, tangibles, colleagues, etc.)
* determine effective developmental, age-appropriate, and culturally sensitive instructional strategies in Technology that support the instruction of licensed teachers
* practice gathering and recording data regarding student performance in the area of Technology using tools such as rubrics, curriculum-based measurements, and informal assessments
* increase knowledge of terminology related to the instruction of Technology
* gain an understanding of how the Minnesota Standards and Testing (including state and local testing) direct the teaching of Technology in Minnesota
* develop strategies to support and reinforce the instruction of students in Technology following written and oral lesson plans developed by licensed teachers
* explore the use of technology in the learning and application of Technology (1 C: 1 lect/pres, 0 lab)

CACE 1480 - Caring for Children with Special Health Needs
This course introduces terminology and basic concepts of care related to children with special medical needs. The purpose of this course is to provide some basic knowledge and information on a variety of medical disabilities and how these medical issues affect a child’s care. Some of these disabilities may require short-term intervention and support, while other disabilities are a lifelong challenge. This information is designed to give a framework of information the student can build upon.
Course Outcomes:
* define universal precautions and how infection control measures protect oneself from germs
* define handling, transferring, positioning and range of motion and know which children may need such assistance
* list the principles of basic body mechanics
* describe 3 types of urinary catheters and how they are used
* define colostomy, ileostomy, and urostomy and how to care for a child with an ostomy
* define diabetes
* list common feeding problems and appropriate interventions such as tube feedings
* define asthma and describe types of treatments and why they might be used
* describe seizures and list their common causes
* describe where on the body IV needles, catheters respiratory, or ports might be found
* list 3 classifications of vision impairments
* name and describe 4 types of hearing loss and discuss techniques and adaptive equipment a child could use to increase independence
* state who a caregiver should seek assistance from before caring for children with any of the above conditions
(2 C: 2 lect/pres, 0 lab)

CADD 1501 - Mechanical CADD I - Modified Course for Tech Prep
Students will develop knowledge of system configuration and operation of interactive graphics software and will input drafting commands to develop drawings, store data and output drawings to the plotter for hard copy.
Course Outcomes:
* demonstrate start up and shut down procedures for computer software
* manipulate the drawing software
* set up drawing layout and create basic drawings
* treat classmatess with respect
Corequisite(s): CADD1502
( C: 0 lect/pres, 0 lab)

CADD 1502 - Mechanical CADD II
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.
Course Outcomes:
* define and 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
* demonstrate timeliness in finishing assignments
* treat classmates with respect
Prerequisite(s): CADD1502
(3 C: 1 lect/pres, 2 lab)

CADD 1511 - CADD Applications - Modified Course for Tech Prep
This course will provide students with additional practice in the fundamentals of multi-view drawings, libraries and attributes using 2D and 3D modeling software. Students will develop knowledge of system configuration and operation of interactive graphics software and will input drafting commands to develop drawings, store data and output drawings to the plotter for hard copy.
Course Outcomes:
* define and demonstrate the use of standard dimensioning rules and terms
* produce multi-view drawings according to industry standards
* utilize dimensional notes to call out various machine element features
* demonstrate timeliness in finishing assignments
* 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)

CADD 1512 - CADD Applications I
This course provides students with additional practice in the fundamentals of multi-view drawings, along with the fundamentals of dimensioning standard machine elements, dimensional notes and functional drawing dimensioning. Students will create component part drawings using 2D and solid modeling software.
Course Outcomes:
* define and demonstrate the use of standard dimensioning rules and terms
* produce multi-view drawings according to industry standards
* utilize dimensional notes to call out various machine element features
* demonstrate timeliness in meeting deadlines
* treat classmates with respect
* create and modify basic detail part drawings and 3 dimensional objects
( 3 C: 0 lect/pres, 0 lab)

CADD 1510 - Mechanical CADD I
Students will develop knowledge of system configuration and operation of interactive graphics software and will input drafting commands to develop drawings, store data and output drawings to the plotter for hard copy.
Course Outcomes:
* demonstrate start up and shut down procedures for computer software
* manipulate the drawing software
* set up drawing layout and create basic drawings
* treat classmates with respect
Corequisite(s): CADD1502
( C: 0 lect/pres, 0 lab)
* create and modify basic detail part drawings and 3 dimensional objects
* create and assemble 3D objects
Prerequisite(s): CADD1502
(3 C: 1 lect/pres, 2 lab)

**CADD 1516 - CADD Applications II**
This course provides information for completing engineering drawings including design layouts, geometric construction, fasteners, tolerances and fits using 2D and solid modeling software.
Course Outcomes:
* create drawings using geometric construction
* determine tolerances for mating parts
* create drawings with tolerances
* create drawings of fasteners
* create drawings needing section views
* demonstrate timeliness in finishing assignments
* treat classmates with respect
* create blocks and attributes
* create symbol libraries
Prerequisite(s): CADD1507, CADD1512
(3 C: 1 lect/pres, 2 lab)

**CADD 1521 - Applied Physics - Modified Course for Tech Prep**
The student will study the principles of force, motion, acceleration, deceleration, work, power, energy, thermodynamics and the properties of solids, liquids, and gases. They will apply this knowledge through experimentation and problem solving.
Course Outcomes:
* calculate unknown information dealing with linear and rotational motion
* calculate unknown information dealing with forces causing or preventing motion
* determine unknown vector information by applying trigonometry
* calculate simple work, power and energy problems
* solve situations dealing with simple machines
* understand and determine unknown information when dealing with the affects of heat on materials
* understand the properties of all matter including solids, liquids, and gasses
Prerequisite(s): TECH1522 or MATH1300
(4 C: 0 lect/pres, 0 lab)

**CADD 1522 - Applied Physics**
The student will study the principles of force, motion, acceleration, deceleration, work, power, energy, thermodynamics and the properties of solids, liquids and gases. They will apply this knowledge through experimentation and problem solving.
Course Outcomes:
* calculate unknown information dealing with linear and rotational motion
* calculate unknown information dealing with forces causing or preventing motion
* determine unknown vector information by applying trigonometry
* calculate simple work, power and energy problems
* solve situations dealing with simple machines
* understand and determine unknown information when dealing with the affects of heat on materials
* understand the properties of all matter including solids, liquids, and gasses
Prerequisite(s): TECH1522 or MATH1300
(4 C: 1 lect/pres, 3 lab)

**CADD 2505 - Production CADD I**
This course will provide students with the techniques to do sketches of objects as well as advanced drawings consisting of sections, auxiliary views, and the application of finish marks using 2D and solid modeling software.
Course Outcomes:
* create hand sketches of objects
* create design layout of bolted assemblies
* apply surface finishes to drawings
* create detail drawings requiring auxiliary views
* demonstrate timeliness in finishing assignments
* treat classmates with respect
Prerequisite(s): CADD1516
(3 C: 1 lect/pres, 2 lab)

**CADD 2509 - Production CADD II**
This course will provide students with the knowledge and skills to create bolted and welded assembly drawings using 2D and solid modeling software.
Course Outcomes:
* identify common parts of welding symbols
* create welded assembly drawings
* create bolted assembly drawings
* create parts list for drawings
* demonstrate timeliness in finishing assignments
* treat classmates with respect
Prerequisite(s): CADD2505
(3 C: 1 lect/pres, 2 lab)

**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.
Course 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)

**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.
Course 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)

**CADD 2517 - Statics and Strength of Materials - Modified Course for Tech Prep**
Statics is an area of study concerned with determining the magnitude and direction of forces acting upon or generated by machine components. Strength of materials involves calculating stress, strain, and modulus of elasticity to determine material to be used and size of structural members.
Course Outcomes:
* determine unknowns in a concurrent-coplanar force system
* determine unknown values of stress or strain
* calculate unknowns in a parallel force system
* calculate and create shear diagrams
* calculate and create bending moment diagrams
* determine proper material for specific applications
* determine proper size for material in specific applications
(3 C: 0 lect/pres, 0 lab)

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**PLEASE NOTE:** All program plans are preliminary and curriculum may change without notice.
CADD 2518 - Statics and Strength of Materials  
Statics is an area of study concerned with determining the magnitude and direction of forces acting upon or generated by machine components. Strength of materials involves calculating stress, strain, and modulus of elasticity to determine material to be used and size of structural members.  
Course Outcomes:  
* determine unknowns in a concurrent-coplanar force system  
* determine unknown values of stress or strain  
* calculate unknowns in a parallel force system  
* calculate and create shear diagrams  
* calculate and create bending moment diagrams  
* determine proper material for specific applications  
* determine proper size for material in specific applications  
Prerequisite(s): CADD1522 or PHYS1300  
(3 C: 1 lect/pres, 2 lab)

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”.  
Course 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)

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.  
Course 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)

CADD 2531 - Geometric Dimensioning and Tolerancing  
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.  
Course Outcomes:  
* apply geometric tolerances of form to drawings  
* apply geometric tolerances of profile to drawings  
* apply geometric tolerance of orientation to drawings  
* apply geometric tolerance of runout to drawings  
* apply geometric tolerance of location to drawings  
* determine what geometric symbol should be used for different applications  
Prerequisite(s): CADD1516  
(1 C: 0 lect/pres, 1 lab)

CADD 2541 - Basic CAM  
This course will emphasize the function of Computer-Aided Manufacturing software (CAM), and the application of computer generated machining data.  
Course Outcomes:  
* manipulate basic 2D and 3D geometry for milling machine using CAM software  
* develop tool paths and CNC program for lathe and milling machine  
* generate basic g-codes using post processors for the mill and lathe  
* generate projects using CNC mill and lathe  
* meet deadlines in a timely manner  
* exercise safe practices when using lab equipment  
* create projects using CNC mill and lathe  
Prerequisite(s): CADD1502  
(2 C: 0 lect/pres, 2 lab)

CADD 2542 - Reverse Engineering  
This course will enhance the student’s ability to use various forms of inspection devices. Students will sketch and document finished part data. Students will create assembly and detailed piece part drawing. Creation of these drawings will help build a portfolio of engineering documents for job interviews.  
Course Outcomes:  
* measure parts with inspection equipment  
* produce sketches of parts and document measurements  
* 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 manufacturing practices  
* select drawings to be inserted in a student portfolio  
* manage time and meet deadlines  
* demonstrate the ability to respect others and their ideas  
* utilize the Metric and English measuring system  
Prerequisite(s): CADD2509  
(2 C: 0 lect/pres, 2 lab)

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.  
Course 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)

CARP 1505 - Construction Tools - Modified Course for Tech Prep  
This course will enable students to identify, properly use and maintain carpenter hand, portable tools, machines and equipment. Skills development, safety, OSHA requirements and work practices are stressed. Construction equipment is studied and utilized as lab and projects warrant.  
Course Outcomes:  
* recognize carpentry hand, portable and stationary tools and machines  
* use demolition tools  
* use layout and measuring tools  
* use hand tools properly  
* use portable power tools properly and safely  
* use stationary power tools properly and safely  
( C: 0 lect/pres, 0 lab)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
CARP 1506 - Construction Tools, Equipment and Machines
This course will enable you to identify, properly use and maintain carpenter hand, portable tools, machines and equipment. Skill development, OSHA requirements and work practices are stressed. Construction equipment is studied and utilized as lab and projects warrant.
Course Outcomes:
* recognize carpentry hand, portable and stationary tools and machines
* use demolition tools
* use layout and measuring tools
* use hand tools properly
* use portable power tools properly and safely
* use stationary power tools properly and safely
(3 C: 0 lect/pres, 0 lab)

CARP 1513 - Blueprint Reading and Estimating - Modified Course for Tech Prep
This course will enable students to develop skills in reading the UBC Building Codes for residential construction and applying them to blueprints. The course concentrates on the lines, symbols and abbreviations to read and understand the pages of residential blueprints. Knowledge of building codes will be stressed.
Course Outcomes:
* sketch and draw symbols and lines
* understand the different lines, symbols and abbreviations
* draw and sketch plans, sections, elevations, schedules and details
* understand how to read blueprints
* explain Specifications
* find code requirements from the U.B.C. Building Codes book and handouts
* explain and estimate different materials
( C: 0 lect/pres, 0 lab)

CARP 1514 - Blueprint Reading and Estimating
This course will enable students to develop skills in reading the UBC Building Codes for residential construction and applying them to blueprints. The course concentrates on the lines, symbols and abbreviations to read and understand the pages of residential blueprints. Materials and estimating will be part of the student’s studies.
Course Outcomes:
* sketch and draw symbols and lines
* understand the different lines, symbols and abbreviations
* draw and sketch plans, sections, elevations, schedules and details
* understand how to read blueprints
* explain specifications
* find code requirements from the U.B.C. Building Codes book and handouts
* apply U.B.C. Building Codes to prints and handouts
* explain and estimate different materials
(3 C: 1 lect/pres, 2 lab)

CARP 1519 - Construction Principles - Modified Course for Tech Prep
This course will enable the student to learn about materials and methods for framing floors, walls, and rafters for residential and light commercial construction. The course will cover terms, techniques and layouts used. Estimating and materials used will also be emphasized.
Course Outcomes:
* recognize residential layout and framing techniques
* layout and frame floor systems
* layout and frame exterior and interior walls
* understand different roof systems
* estimating of materials
* understand Codes and how applied
* install windows and doors
* install roofing material, siding, cornice, etc.
(4 C: 1 lect/pres, 3 lab)

CARP 1524 - Rafters and Stairs
This course will enable the student to learn about materials and methods for framing floors, walls, and rafters for residential and light commercial construction. Rafter framing of different roof systems will be emphasized. Straight stairs, hand railings, terms, techniques and layout will be emphasized.
Course Outcomes:
* recognize residential layout and framing techniques
* layout and frame floor systems
* layout and frame exterior and interior walls
* layout and cut common rafters
* layout and cut hip rafters
* frame gable roofs
* frame hip roofs
* design and layout straight stairs
* layout and cut stair stringers
* install stairs
* install stair rails
Prerequisite(s): CARP1506, CARP1514, CARP1521
(4 C: 2 lect/pres, 2 lab)

CARP 1525 - Exterior/Interior Finish - Modified Tech Prep Course
This course will enable students to examine types, styles and applications of sidings, roofing treatments and finishes. This class will also cover insulation, paneling and wallboard applications as well as interior finishes and woodwork.
Course Outcomes:
* install cornice finish treatments
* install roofing materials
* install exterior doors and windows
* install various manmade and natural sidings
* install insulation and vapor barriers
* install wallboard and paneling
* install interior swinging and bi-fold doors
* install window and door casing
* install baseboard
* install interior finish moldings
Prerequisite(s): CARP1506, CARP1514, CARP1521
( C: 0 lect/pres, 0 lab)

CARP 1527 - Exterior/Interior Finish
This course will enable students to examine types, styles and applications of sidings, roofing treatments and finishes. This class will also cover insulation, paneling and wallboard applications as well as interior finishes and woodwork.
Course Outcomes:
* install cornice finish treatments
* install roofing materials
* install exterior doors and windows
* install various manmade and natural sidings
* install insulation and vapor barriers
* install wallboard and paneling
* install interior swinging and bi-fold doors
* install window and door casing
* install baseboard

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
CARP 1529 - Building Layout and Concrete
This course will enable students to cover building layout terms and techniques using builder and laser levels. Students will find property lines, building lines, and layout a basement for a house. The course will also cover types of foundations, and materials used in foundations. Concrete will also be emphasized as a building material. Students will also develop skills in forming and pouring concrete flatwork like sidewalks, driveways, steps and floor slabs. The course will concentrate on the make-up of concrete, tools used, safety and techniques used in the industry.

Course Outcomes:
* layout building according to print
* recognize codes and terms used in layout
* locate and string property lines
* identify required inspections by the building officials before footings are poured
* identify foundation types and materials used in the industry
* determine elevations using builder levels and laser levels
* form sidewalk and driveways
* identify the ingredients in concrete
* choose the correct tools and techniques for finishing concrete
* pour and finish concrete flatwork projects

Prerequisite(s): CARP1506, CARP1514
(4 C: 1 lect/pres, 3 lab)

CARP 1530 - Residential Drafting and Design
This course will enable students to study residential housing design characteristics and the factors that determine or affect them. The class will cover factors such as age, family size. Lifestyles, etc. and how housing design can enhance them. Students will be able to design and analyze using Softplan.

Course Outcomes:
* design housing for different lifestyles
* design for family size and/or resale
* design “spec” housing for subdivisions
* design 1 and 2 story homes
* draw floor plans with Softplan
* draw sections and elevations with Softplan
* develop a set of blueprints for a residence

Prerequisite(s): CARP1514
(2 C: 0 lect/pres, 2 lab)

CARP 1535 - Cabinet Building and Estimating - Modified Tech Prep Course
This course will enable students to study design and construction fundamentals and techniques. Students also learn materials, hardware and finishing skills for custom made residential cabinetry. Estimating of materials will also be included. Basic drafting principles will apply.

Course Outcomes:
* install interior finish moldings
* understand the use of different materials
* draw and design cabinet projects
* prepare surfaces for finish
* make finishing material selections
* construct cabinet drawers
* construct cabinet doors
* construct frame and panel construction

Prerequisite(s): CARP1506, CARP1514
(3 C: 1 lect/pres, 2 lab)

CARP 1536 - Cabinet Building and Estimating
This course will enable students to study design and construction fundamentals and techniques. Students also learn materials, hardware and finishing skills for custom made residential cabinetry, estimating of materials will also be included. Basic drafting principles will apply.

Course Outcomes:
* estimate, measure, and choose cabinet materials
* estimate, order and install appropriate cabinet hardware
* select the correct joint for all types of cabinet construction
* construct cabinet cases
* construct frame and panel construction
* construct cabinet doors
* construct cabinet drawers
* make finishing material selections
* prepare surfaces for finish
* apply finishes
* draw and design cabinet projects
* understand the use of different materials

Corequisite(s): CARP1506, CARP1514
(5 C: 2 lect/pres, 3 lab)

CARP 2502 - Concrete II
This course will enable the student to analyze terms, materials and techniques used to form, reinforce and pour foundation, footings and walls.

Course Outcomes:
* determine finished footing/wall elevations
* lay out building and grade stakes
* construct footing/wall, and flat-work forms
* calculate concrete volume
* place and finish concrete with various finishes

Prerequisite(s): CARP1529
(2 C: 1 lect/pres, 1 lab)

CARP 2506 - Residential Framing II
This course will enable students to analyze and use their knowledge to select materials and layout methods. Advanced methods of framing floors and walls will also be emphasized. Students will also use these skills on a residential structure.

Course Outcomes:
* construct basement bearing walls and header systems
* examine and utilize various types of floor framing systems
* determine layout for wall framing, including rough openings and header sizes and types
* construct exterior and interior walls
* lay out and install engineered roof framing systems
* frame intersecting roofs using engineered materials and hand framing techniques
* apply sheathing using fastener schedules per code

Prerequisite(s): CARP1521, CARP1524, CARP1506, CARP1514
(4 C: 2 lect/pres, 2 lab)

CARP 2510 - Stair Building
The student will study fundamental and advanced methods of stair building. This will include calculations, layout, and terminology related to stair building. This course will enable the students to study design, style, and safety of various stairs. The course will include layout and construction of several styles of stairs.

Course Outcomes:
* be familiar with stair terminology and staircase types
* complete stair design calculations based on rise over run formulas
* calculate stairwell openings, maintaining proper headroom and landing clearances
* design, layout, cut, and assemble a stair carriage with a tread and riser system
* calculate, cut, and assemble a handrail and guardrail system for the stair system
* understand and comply with the Uniform Building Code and ADA requirements

Prerequisite(s): CARP1524, CARP1506, CARP1514, CARP1521
(2 C: 1 lect/pres, 1 lab)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
CARP 2518 - Exterior Finish
This course will enable the student to develop skills used to properly install windows, exterior doors, shingles, soffits and siding.
Course Outcomes:
* estimate complete projects
* identify the components of estimating
* perform cost estimates
* compare scheduling methods
* compute net billing calculations
* understand construction documents
(3 C: 2 lect/pres, 1 lab)

CARP 2526 - Residential Construction Lab II
This course will enable the student to implement and practice the knowledge and skills learned to build a residence. Course will focus on interior finish and trim techniques and materials.
Course Outcomes:
* form, calculate, pour, and finish interior and exterior concrete
* construct floors, walls, ceilings, and roofs; from framing through exterior and interior finish, including wallboard and finish floor systems
* install windows and doors, from framing through interior and exterior finish
* perform interior finish functions: install doors, interior trim work, closets, cabinetry, and finish hardware
* construct decks and interior and exterior stair and railing systems
* perform site work; form excavation layout and building elevations to final grading and job site clean-up
Prerequisite(s): CARP2506, CARP2518, CARP2522, CARP2524
(3 C: 0 lect/pres, 3 lab)

CARP 2522 - Interior Finish
This course will enable the student to study methods of finishing the interior of a house; from insulation and gypsum board; to hanging doors and installing trim. Finish skills will also include: wood flooring, underlayment, shelving, and cabinet installation.
Course Outcomes:
* animate countertop materials and construction methods
* determine project site cabinet layout and install cabinets and accessories
* develop and practice cabinet finishing techniques
* construct cabinets, cabinet doors, drawers, and accessories
* examine installation methods of wood and ceramic tile floor coverings
Prerequisite(s): CARP1527, CARP1506, CARP1514, CARP1521
(3 C: 1 lect/pres, 2 lab)

CARP 2524 - Residential Construction Lab I
This course will enable the student to use the construction skills and techniques he/she has developed to build a residence as needed. Course will focus on framing and exterior finishes.
Course Outcomes:
* lay out, estimate, form and pour concrete footings, foundations, and flatwork
* frame and sheath floor, wall, and roof systems
* prepare roof surface and install roofing materials
* complete cornice, soffit, and fascia framing and finish
* install exterior doors and windows
* install various types of siding and accessories
Prerequisite(s): CARP1524, CARP1506, CARP1514, CARP1521
(5 C: 0 lect/pres, 5 lab)

CARP 2530 - Cabinet Building II
This course will enable the student to analyze, design, layout, and construct wall and base cabinets for a house project. Consideration will be given to kitchen shape and workability along with materials, finishes, and countertops.
Course Outcomes:
* be familiar with cabinet construction terminology and industry standards
* examine cabinet materials and perform square foot and board foot calculations
* draw and dimension a cabinet and develop a cutting list
* construct cabinets, cabinet doors, drawers, and accessories
* develop and practice cabinet finishing techniques
* determine project site cabinet layout and install cabinets and accessories
* analyze countertop materials and construction methods
Prerequisite(s): CARP1506, CARP1514, CARP1536
(4 C: 1 lect/pres, 3 lab)

CARP 2534 - Construction Management
This course will enable the student to study the needs and requirements of a contractor as he/she runs the business. The course will concentrate on job site management, business management and the personal skills needed for a construction business to get started and remain profitable.

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

Course Outcomes:
* quantify measurements in the appropriate metric units as well as convert between 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

Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.

(4 C: 3 lect/pres, 1 lab)

CHEM 1341 - Introduction to Organic and Biochemistry
Meets Mn Transfer Goal 3 - Natural Sciences. This course is intended as a broad introduction to organic and biochemistry 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 and oils, amino acids and proteins, and nucleic acids. This course includes four 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.

Course 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 submicroscopic form with macroscopic function in organic and biochemicals
* relate organic and biochemistry topics to everyday life

Prerequisite(s): CHEM1340

(4 C: 2 lect/pres, 2 lab)

CHEM1342 - Organic and Biological Chemistry
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.

Course 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 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)

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.

Course 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.

(3 C: 3 lect/pres, 0 lab)

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.

Course 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)

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.

Course 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)

CMAE 1514 - MSSC Safety
This course is designed to align with the Manufacturing Skill Standards Council’s
CMAE 1518 - MSSC 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.

Course Outcomes:
* exhibit the use of a scientific calculator
* demonstrate effective use of resources including faculty, reference materials, and the Internet
* 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

Course Outcomes:
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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.

Course Outcomes:
* solve practical problems in all topical 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

Course Outcomes:
* exhibit the use of a scientific calculator

CMAE 1564 - Shielded Metal Arc Welding (SMAW)

CMAE 1566 - Gas Metal Arc Welding (GMAW) Flux Cored Arc Welding (GC-AW)

CMAE 1518 - MSSC Manufacturing Processes
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CMAE 1564 - Shielded Metal Arc Welding (SMAW)

CMAE 1566 - Gas Metal Arc Welding (GMAW) Flux Cored Arc Welding (GC-AW)

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

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.
Course 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)

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.
Course Outcomes:
* develop an understanding of the terminology used in the study of metals
* 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)

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.
Course 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)

CMSC 1206 - Basic Networking/Security
Basic concepts and terminology used in local area networks will be covered, including the OSI and 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. In addition, to address network security issues, this course will provide an understanding of information security management and the technical components of security. The material covers the history and terminology of security and an overview of how to manage information security issues. Topics include legal and ethical issues, risk management, security design, and maintenance.
Course Outcomes:
* define networking fundamentals
* describe how LAN and WAN communications work
* analyze/select appropriate networking devices for connecting networks
* describe a process for connecting devices in a wireless network
* perform resource sharing on a network
* define and implement a basic network design
* organize a network maintenance and troubleshooting plan
* describe the need for information security
* describe the legal, ethical and professional issues in information security
* define risk management
* analyze criteria needed in planning for security
* select appropriate security technology tools
* design a plan for physical security
* structure and implement an information security plan
* define security as it relates to personnel
* organize an information security maintenance plan
(3 C: 2 lect/pres, 1 lab)

CMSC 1212 - Web Markup Language
This course will teach the student how to create web pages. It will also teach them how to get those pages on the Internet and make them visible to the world. It will teach the student HTML which is the markup language used by the Internet. It will also teach the student Javascript and Cascading Style Sheets which are used to make web pages dynamic and formatted. Students will also complete exercises using links, sound, graphics, animation and forms. The programming techniques include handling conversions from both clients and servers, passing communication, distributed information handling and tags. Page loading tech-

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
CMSC 1215 - XML
XML is a language that allows information and services to be encoded with meaningful structure and semantics. It is used for information exchange over the internet. Visual Basic, Java and many more languages use XML to process information. XML fundamentals and concepts, architecture, information modeling, XML processing, transformations and testing and tuning will be covered to prepare the student for the certification test.

Course Outcomes:
* use inheritance and implement object-oriented methodology in programs
* debug and modify existing Java programs
* create new Java programs and classes
* understand object-oriented programming

Prerequisite(s): CMSC1203
(3 C: 2 lect/pres, 1 lab)

CMSC 1216 - Database Modeling I
Databases are an integral part of computer systems. This course is the first of two database modeling courses. It covers RDBMS basics, introduction to SQL Server 2005, installation of SQL 2005, create databases through scripts, T-SQL statements, joins, creating and altering tables, add/modify/delete data in tables, constraints, queries, database normalization, indexes, views, writing scripts and batches, stored procedures and user defined functions.

Course Outcomes:
* install and configure SQL Server and databases
* maintain databases
* implement queries to retrieve data from databases
* create functions to access data

Prerequisite(s): CMSC1203
(3 C: 2 lect/pres, 1 lab)

CMSC 1225 - 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.

Course 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)

CMSC 2201 - Database Modeling II
Database Modeling II is an extension of Database Modeling I. SQL server installation and configuration, configuring SQL Server instances, databases and security; configuring linked servers; database mirroring; log shipping; database snapshots as well as data customer support. Data retrieval, manipulation, management through XML, exceptions are covered. Service Broker components are implemented as well as importing and exporting data to files. Replication management is introduced. Database maintenance, management, backup and restoration are covered. Monitoring and troubleshooting SQL Server performance and gathering performance and optimization data by using DMVs are the new pieces that are introduced in this course along with continuing database creation and maintaining databases from Database Modeling I.

Course Outcomes:
* install and configure SQL Server
* implement high availability and disaster recovery
* support data consumers
* maintain databases
* gather performance and optimization data by using the SQL Server Profiler
* gather performance and optimization data by using the Database Engine Tuning Advisor
* build a workload file, monitor and resolve blocks and deadlocks, diagnose and resolve database server errors
* monitor SQL Server Agent job history
* gather performance and optimization by using DMV’s

Prerequisite(s): CMSC1203, CMSC1216
(3 C: 2 lect/pres, 1 lab)

CMSC 1255 - Agile Programming Methodology
Agile programming methodology abandons the SDLC in program development. Simple design, design as you go, incremental steps, independent steps and knowing the tools that are available to use for your purpose are core rules of Agile programming. Agile programming implements the use of team programming, usually groups of 2-10. With Agile methodology, programmers can react more quickly to requirement changes and additions. Constant coding, testing and implementation are imperative in Agile programming. An expert user is also always part of the process.

Course Outcomes:
* work for the outcome
* invest in your team
* deliver what users want
* listen to users
* keep a solutions log
* practice collaborative ownership
* keep others informed

(3 C: 2 lect/pres, 1 lab)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* develop VB.NET programs using the rapid application process
* understand how to implement the event-driven programming process
* understand how to create, code and compile programs in the .NET environment

Users develop applications using a GUI interface. A GUI language is very powerful as it allows for a more user-friendly interface to be created. Visual Basic .NET is a GUI language which contains an enormous collection of basic functions that are available through user actions. The .NET Framework is the core component of this language which contains an enormous collection of basic functions that are available through user actions. The .NET Framework is the core component of this language which contains an enormous collection of basic functions that are available through user actions. The .NET Framework is the core component of this language which contains an enormous collection of basic functions that are available through user actions. The .NET Framework is the core component of this language which contains an enormous collection of basic functions that are available through user actions.

CMSC 2203 - C# Programming
C# is an object-oriented language from Microsoft that is derived from C and C++. C# is programmed in the .Net environment. C# features include using variables, functions, multi-dimensional and jagged arrays, overloading, indexes, attributes and overriding and XML integration. Console applications, Windows applications and ASP.Net web services can be written in C#.

Course Outcomes:
* understand object-oriented programming
* create new C# programs and classes
* debug and modify existing C# programs
* implement arrays, overloading and index in C# programs
* integrate XML into a C# application

Prerequisite(s): CMSC2203
(3 C: 2 lect/pres, 1 lab)

CMSC 2204 - Mobile Device Programming/Connectivity
Mobile devices are being used more and more in the business world. Having the knowledge to program these devices will increase the programmer’s value in the workplace. Thru mobile web forms and XML, this course teaches the programmer to build applications that render intelligently on different devices.

Course Outcomes:
* program ASP.NET mobile web forms
* program controls
* implement style sheets on mobile web forms
* access data from the mobile device
* integrate XML web services

Corequisite(s): CMSC2202
Prerequisite(s): CMSC2203
(3 C: 2 lect/pres, 1 lab)

CMSC 2205 - Internship
This will be available to students who have demonstrated readiness and willingness to work in an on-the-job situation. It usually will be a training culmination and an opportunity to apply the skills learned.

Course Outcomes:
* maintain satisfactory attendance at the internship site
* perform job tasks satisfactorily
* display honesty and courtesy
* demonstrate initiative and dependability
* conform to all rules and regulations of the host company and industry

(3 C: 0 lect/pres, 0 lab, 3 other)

CMSC 2210 - Visual Basic Programming
Visual Basic.NET is an event-driven programming language that is used to write Windows application in which the course of application execution is controlled through user actions. The .NET Framework is the core component of this language which contains an enormous collection of basic functions that are available for the user to implement. The Framework contains operating system functionality as well as the ability to wrap the final product into a package for deployment. Users develop applications using a GUI interface.

Course Outcomes:
* understand how to create, code and compile programs in the .NET environment
* understand how to implement the event-driven programming process
* develop VB.NET programs using the rapid application process
* understand programming basis such as variables, data types, classes, constants, event-driven terminology

Prerequisite(s): CMSC2203
(3 C: 2 lect/pres, 1 lab)

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.

Course 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): CMSC2203, CMSC2225, CMSC2203
(3 C: 2 lect/pres, 1 lab)

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 and students will become versed in Exception Handling, arrays, ArrayLists, serialization and threads. Database connectivity and file processing will be covered thoroughly.

Course Outcomes:
* write stand-alone Java applications
* embed Java applets in HTML documents
* connect to databases/files on various platforms
* code and process arrays
* implement exception handling
* implement threads in Java programs

Prerequisite(s): CMSC2125
(3 C: 2 lect/pres, 1 lab)

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.

Course Outcomes:
* understand Internet terminology including ports, servers, clients, TCP protocol, UDP protocol, URL, DNS

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* 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): CMSC1203, CMSC1225, CMSC2266
(3 C: 2 lect/pres, 1 lab)

CMSC 2279 - Systems Analysis and Design
This course includes an introduction to systems analysis and design, technique and tools. Students will complete an application project throughout the term. Course Outcomes:
* understand complete systems
* relate output with input and file storage
* interact with other programs in a group environment
* document each step of the total system
* make presentations both written and oral
Prerequisite(s): CMSC2266, CMSC1216
(3 C: 2 lect/pres, 1 lab)

CMST 1320 - Introduction to Communication Studies
Meets MN Transfer Goal 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. Course Outcomes:
* examine the importance of interpersonal and intrapersonal communication in the development of self-identity
* evaluate the influence of self-concept and perception on communication
* explore the effects of emotions on communication
* analyze the differences in verbal and nonverbal communication
* analyze individual communication styles
* demonstrate active listening skills
* explain the connection between communication and relational dynamics
* examine the cultural and gender differences affecting interpersonal communica-
* demonstrate strategies for overcoming communication obstacles
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)
COMM 1330 - Media and Social Issues
Meets MN Transfer Goals 2 and 9 - Critical Thinking and Ethical and Civic Responsibility. This course is designed to help students develop an informed and critical understanding of the nature of mass media, the techniques used by them, and the impact of these techniques on society. It is aimed to increase students' understanding and enjoyment of how the media works, how they produce meaning, how they are organized, and how they construct reality with an emphasis on social issues.
Course Outcomes:
* develop an awareness of the impact of media on cultural attitudes and values as applied to social issues
* understand the historical power structure and development of media
* develop an understanding of the mass communication process
* identify strategies for analyzing and discussing media messages
* develop an understanding of media content as a text that provides insight into our culture and our lives
* recognize historical group representation and its connection to discrimination
* develop the ability to understand and analyze media content as applied to social issues
* examine the ethical and moral obligations of media practitioners and the viewing, reading, and listening public
* understand implications of globalization on media ownership and diversity
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

CPTR 1205 - Basic Computer Skills
This course teaches the skills and basic concepts related to personal computer use. The course will include an introduction to the various components (hardware) found in desktop and laptop computers, common devices attached to computers (peripherals), current computer operating systems, keyboarding, basic productivity applications, file storage and management, electronic mail, internet and learning management systems. This course is intended for students with little or no prior computer experience.
Course Outcomes:
* identify and describe the major components of desktop and laptop computer hardware
* identify and describe the uses of common peripheral devices
* describe the functions of current computer operating systems
* customize an operating system to meet the needs of the user
* use correct keyboarding techniques
* introduce word processing, spreadsheet and slide show presentation applications
* save files locally, on removable media and on network drives
* demonstrate best practices for file management
* use common electronic mail systems to send, receive and manage electronic mail
* understand and practice the use of Internet browsers, safe Internet practices and Internet etiquette
* demonstrate the use of learning management systems
(2 C: 2 lect/pres, 1 lab, -1 other)

CPTR 1210 - Introduction to Computers
Students will gain an understanding of computer hardware and software in addition to becoming familiar with terminology used in the computer world. Emphasis will be placed on the moral and social implications of computer technology; computer applications used in today's society; the human factors involved in the use of computer; and the historical development of computers. Students will also gain hands-on experience with the word processing, database, spreadsheet and presentation applications found in the Microsoft Office suite of applications.
Course Outcomes:
* gain an understanding of computer hardware, software and terminology
* demonstrate effective interpersonal conflict resolution skills
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

CRTC 1300 - Introduction to Critical Thinking
Meets MN Transfer Goals 2 and 6 - Critical Thinking and Humanities. 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.
Course Outcomes:
* apply creative thinking and logical reasoning to problem solving situations
* identify and distinguish between facts, assumptions, inferences and implications in beliefs, arguments and theories
* apply effective problem solving techniques to monological and multilogical problems
* apply strategies for reducing bias and prejudice
* analyze the elements of thought in decision making and communication
* apply ethical reasoning to problem solving situations
* apply the affective qualities of thought (fairmindedness, independence, courage, humility, integrity, and perseverance) to evaluating and expressing beliefs, arguments and theories
* display intellectual standards of accuracy, precision, clarity, fairness, completeness, and depth in their coursework
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

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.
Course 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
(1 C: 1 lect/pres, 0 lab)

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

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CULN 1201 - 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, warewashing procedures, equipment identification and equipment usage.
Course Outcomes:
* utilize terminology
* perform dish room procedures
* understand kitchen math
* estimate food expenses and profit and loss statements
* knowledge of recipe utilization
* menu planning
* perform preparation procedures (Misen Place)
Prerequisite(s): MATH0380 or Appropriate Accuplacer Score.
(3 C: 2 lect/pres, 1 lab)

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.
Course 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 Appropriate Accuplacer Score.
(3 C: 2 lect/pres, 1 lab)

CULN 1203 - Introduction to Culinary Arts - Modified Course for Tech Prep
This course includes an introduction to the Food Service Industry, culinary terms, history, and use of weights and measures. This course also covers basic cooking techniques and knife identification and use.
Course Outcomes:
* provide an explanation of program expectations
* define industry segments
* identify employment opportunities
* identify industry equipment
* give an explanation of proper knife usage
( C: 0 lect/pres, 0 lab)

CULN 1204 - Basic Baking - Modified Course for Tech Prep
This course covers baking terminology, function of ingredients and texture of finished products such as quick breads, yeast breads, pies, cakes and cookies.
Course Outcomes:
* demonstrate proper safety and sanitation methods
* understand baking terminology
* show proper use of bakers scale and other weights and measures
* use techniques that will provide proper results in baking
* demonstrate skills in producing a final product
* display professionalism and team effort
( C: 0 lect/pres, 0 lab)

CULN 1205 - Basic Baking
This course covers baking terminology, function of ingredients and texture of finished products such as quick breads, yeast breads, pies, cakes and cookies.
Prerequisite(s): CULN1201
(3 C: 1 lect/pres, 2 lab)

CULN 1210 - Introduction to Pantry Food Preparation
This course covers proper techniques, procedures and responsibilities for the preparation of food, such as salads, salad dressings and sandwiches. Proper care and handling of ingredients and finished products are emphasized.
Course Outcomes:
* identify salad types
* demonstrate proper safety and sanitation methods
* understand pantry components
* comprehend the use of oils and vinegar
* identify sandwich ingredients

CULN 1215 - Servsafe Certification
This course includes an introduction to safe food handling, personal hygiene, food-borne illnesses, HACCP procedures. This course also provides the student an opportunity to pass a food management certificate through the State of MN.
Course 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)

CULN 1220 - Vegetables, Potato, Rice and Farinaceous Products
This course covers identification and preparation of vegetables, potatoes, rice and farinaceous products.
Course 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)

CULN 1230 - Vegetables, Potato, Rice and Farinaceous Products
This course covers identification and preparation of vegetables, such as salads, salad dressings and sandwiches. Proper care and handling of ingredients and finished products are emphasized.
Course Outcomes:
* identify different vegetable types: red, yellow, green, white, etc.
* demonstrate cooking methods
* develop an understanding of starch products (rice’s, pasta, potatoes, grains)
* understand storage procedures for vegetables
* determine sanitation techniques
Prerequisite(s): CULN1201
(2 C: 1 lect/pres, 1 lab)

CULN 1240 - Stocks, Soups, Sauces
This course will identify the preparation of classical and convenience stocks. From these stocks, various soups and sauces will be prepared using various techniques.
Course Outcomes:
* identify stock and sauce ingredients
* understand herbs and spices
* select and utilize proper equipment
* identify and prepare various types of sauces
* use thickening agents
* determine appropriate bases convenience vs. scratch
* prepare various soups
Prerequisite(s): CULN1201
(3 C: 1 lect/pres, 2 lab)

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items using the various moist and dry heat methods.
Course Outcomes:
* demonstrate proper safety and sanitation methods
* identify basic cooking principles and terminology
* prepare sauces to compliment meat, poultry, and fish
* apply skills necessary to produce a final product
* recall knowledge of procedures for specific cooking methods
* identify parts of meats, poultry and fish
* demonstrate fabrication of meat, poultry, and fish
Prerequisite(s): CULN1240
(4 C: 0 lect/pres, 4 lab)

CULN 1260 - Introduction to Breakfast
This course teaches the cooking of meats, eggs, cereals and the preparation of fruits and garnishes for breakfast. This course will include production techniques used in the preparation of breakfast foods.
Course Outcomes:
* identify breakfast food products
* demonstrate proper safety and sanitation methods
* know terminology
* demonstrate skills in producing breakfast eggs, meats and potatoes
* perform breakfast beverage preparation
* identify and properly serve pastries
* display professionalism and teamwork
Prerequisite(s): CULN1201
(2 C: 1 lect/pres, 1 lab)

CULN 1265 - Basic Food Production Principles
This course teaches the preparation of meat, fish, seafood, poultry, vegetables, fruits, pasta and other menu items using the various moist and dry heat cooking methods. This course will include production techniques used in the preparation of foods.
Course Outcomes:
* demonstrate proper safety and sanitation methods
* identify food production terminology
* prepare broiled/grilled meats, fish, seafood, and poultry
* recall techniques that will provide results at each stage of the production process
* prepare roasted/baked meats, fish, seafood, and poultry
* demonstrate teamwork and professionalism
Prerequisite(s): CULN1220, CULN1245, CULN1230, CULN1240, CULN1250, CULN1201
(3 C: 1 lect/pres, 2 lab)

CULN 1270 - Garde Manager
This course is designed to teach the student the fundamentals of garde manage decorating. This will include aspic sheets, chaud froid sauce, fruit carving, vegetable carvings and preparing centerpiece displays.
Prerequisite(s): CULN1250
(4 C: 1 lect/pres, 3 lab)

CULN 1280 - Foodservice Internship
This course includes a three-week internship at local restaurant operations. This course will also give the student an opportunity to sharpen their culinary skills in a fast paced environment. The student will also experience teamwork, problem solving, and a feel for the industry.
Course Outcomes:
* teamwork
* problem solving
* understand the different menu items and cooking procedures
* experience a full service restaurant in operation
* employment
(2 C: 0 lect/pres, 0 lab, 2 other)

CULN 1290 - Social Etiquette
This course is intended to give students basic information about etiquette. Students will understand why things are done as they are. Proper etiquette is dictated if one is to succeed in today’s business world.
(2 C: 0 lect/pres, 2 lab)

DEHY 1400 - Dental Hygiene Seminar I
This course is an introduction to dental hygiene clinical techniques and clinical practice. This course provides didactic instruction on patient medical history and data gathering, sterilization, infection control protocol, comprehensive patient treatment to include assessment, planning, implementation and evaluation of selective services.
Course Outcomes:
* describe theory in dental hygiene clinical techniques
* explain the rationale for preventive dentistry including assessment, planning, implementation and evaluation of selective services necessary for complete patient treatment
* explain the rationale for universal blood and body fluid precautions to include sterilization and infection control protocols
* discuss the concepts of health and wellness in relation to health
* relate the importance of communication to the profession of dental hygiene
* identify and describe how the knowledge of a health history relates to meeting the client’s human need for safety
* review common normal and atypical findings of skin and oral mucosa
* explain the purposes, characteristics and procedures of dental charting
* discuss how the dental hygienist can assist clients with disease prevention and oral health promotion at various stages of the life cycle
* explain the role of the dental hygienist in the prevention and treatment of periodontal disease within the dental hygiene process of care
* discuss the relationship of human need theory to the dental hygiene process
Prerequisite(s): DEHY1480, DEHY1424
(2 C: 1 lect/pres, 1 lab)

DEHY 1402 - Dental Hygiene Seminar II
This course is designed to continue the student’s education in the basic dental hygiene sciences with an emphasis on dental health education, primary preventive measures, and nutritional educational counseling. The course emphasizes the special needs of diabetes, mental retardation, therapy, epilepsy and eating disorders.
Course Outcomes:
* implement the scientific basis for dental hygiene care in the area of education and preventive care
* assess, plan and implement dental hygiene care in the area of nutritional counseling, tobacco counseling and xerostomia counseling
* evaluate the scientific basis for dental hygiene care with an emphasis on the special needs of diabetes, mental retardation, cancer therapy, epilepsy, eating disorders, persons with disabilities, autoimmune diseases, neurological and sensory disabilities, and HIV infection
Prerequisite(s): DEHY1482, DEHY1484
(2 C: 1 lect/pres, 1 lab)

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 planing techniques, powered scaling, sealants, dental materials, implant care and care for the client who is medically compromised.
Course Outcomes:
* understand the scientific basis for dental hygiene technology and methodology and transfer this knowledge first to the laboratory setting and then clinical practice
* 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
* assess management techniques for clients with special needs. This includes older adults, women and children, physical disability and mental disability
* recognize alteration in dental hygiene care for the client with special needs
* evaluate criteria for reporting child abuse
* discuss parameters, for the dental hygiene practitioner, for selection of new products for clients
* write a scientific paper on a consumer new product
* complete Minnesota Jurisprudence exam
* design an appropriate resume and cover letter for a dental hygienist
* write a letter accepting/refusing a job offer and a thank you letter after an interview
* discuss current trends in industry as evidenced by scientific articles
* develop an awareness of ethical dilemmas encountered in the practice of dental hygiene and formulate a basis for decision making
* identify legal issues relevant to the various roles of the dental hygienist
* advocate quality assurance activities in the oral healthcare environment
* explain how an understanding of a client’s cultural frame of reference improves the quality of dental hygiene care
* describe the dental hygienist’s role as a change agent

Corequisite(s): DEHY1420, DEHY1486
Prerequisite(s): DEHY1402, DEHY1482
(2 C: 1 lect/pres, 1 lab)

DEHY 1406 - Clinical Seminar IV

This course is a continuation of DEHY 1404 with continuing focus on care of the client with special needs, and continuing with emphasis on dental hygiene research, leadership, management, ethics and jurisprudence in dentistry, new products, consumer awareness and the role of the dental hygienist in alternative care settings.

Course Outcomes:
* assess management techniques for clients with special needs. This includes older adults, women and children, physical disability and mental disability
* recognize alteration in dental hygiene care for the client with special needs
* evaluate criteria for reporting child abuse
* discuss parameters, for the dental hygiene practitioner, for selection of new products for clients
* write a scientific paper on a consumer new product
* complete Minnesota Jurisprudence exam
* design an appropriate resume and cover letter for a dental hygienist
* write a letter accepting/refusing a job offer and a thank you letter after an interview
* discuss current trends in industry as evidenced by scientific articles
* develop an awareness of ethical dilemmas encountered in the practice of dental hygiene and formulate a basis for decision making
* identify legal issues relevant to the various roles of the dental hygienist
* advocate quality assurance activities in the oral healthcare environment
* explain how an understanding of a client’s cultural frame of reference improves the quality of dental hygiene care
* describe the dental hygienist’s role as a change agent
Corequisite(s): DEHY1488
Prerequisite(s): DEHY1404, DEHY1486
(2 C: 1 lect/pres, 1 lab)

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.

Course Outcomes:
* recognize agencies that regulate the manufacture of dental materials
* analyze the physical properties and biological characteristics of dental materials
* list and explain the characteristics of the ideal dental material
* explain how properties and characteristics of dental materials affect manipula-
* demonstrate manipulation, mixing and use of various dental materials
* demonstrate placement and contouring of sealants and restorative materials
* explain the benefits and limitations of the various types of materials used for inlays, crowns and bridges
* explain the major components in dental porcelains
* demonstrate competency in taking dental impressions
* demonstrate use of dental plaster and stone in model construction
* explain use of polymers and provisional restorations
* assess client needs, plan materials, implement procedures and evaluate results of material use
(2 C: 1 lect/pres, 1 lab)

DEHY 1418 - Introduction to Radiology

This lecture/laboratory course provides dental hygiene students with the knowledge of radiographic principles and exposure techniques. Course content includes theoretical concepts of radiation, radiation safety and monitoring, infection control, x-ray film, processing and mounting, operation of the x-ray unit, intraoral and extraoral radiographic techniques, anatomical landmarks, and exposing and processing errors. The laboratory portion of the course will prepare the student to demonstrate competence in exposing radiographs using the bisecting and paralleling techniques. Students will practice taking radiographs on phantoms, skulls and DXTTR.

Course Outcomes:
* explain the historical development of radiographs in dentistry
* understand the biological effects of radiation and necessary safety precautions
* understand the physics of dental radiology
* identify factors and principles in the imaging of diagnostically acceptable films
* identify the dental films used in intraoral and extraoral radiology
* expose and process intraoral dental radiographs correctly and with minimal errors
* explain and demonstrate paralleling and bisecting techniques when taking film surveys
* correctly mount intraoral dental radiographs
* identify images of anatomical structures and images recorded on bitewing and periapical dental radiographs
* identify radiographic errors and their specific method of correction
* relate radiology with diagnosis and treatment planning
* discuss radiology and the special needs patient
* identify future trends in radiology
* identify essential parts of the x-ray unit and the film processor
* operate the x-ray units and the film processor effectively and correctly
* accept responsibility in providing ethical and competent care in the dental radiology setting
(2 C: 1 lect/pres, 1 lab)

DEHY 1420 - Dental Hygiene Materials and Methods

This course is designed to introduce the student to materials and techniques utilized in clinical situations. The laboratory portion covers sealants, amalgams, impressions, study models, cements, ultrasonics, periodontal therapies, prophy jet polisher, dental records hypersensitivity/irrigation therapy, margins, implants and treatment planning. All topics will be taught to lab competency.

Course Outcomes:
* assess client needs, plan materials, implement procedures and evaluate results for dental hygiene procedures
* design client care plans, incorporating systematic documentation and relevance for client conditions
* utilize advanced fulcrums, furcation curettes, and ultrasonic debridement
* contrast and compare antibiotic and antimicrobial therapies for treatment and periodontal disease
* assess client needs and application of Sealants
* utilization of bleaching trays with study models
* assess client needs for treatment of hypersensitivity

Prerequisite(s): DEHY1484, DEHY1402
(2 C: 0 lect/pres, 2 lab)

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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.
Course 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)

DEHY 1424 - Orofacial Structures
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.
Course Outcomes:
* locate and identify head and neck muscles and bones and their landmarks on a diagram, skulls and patients
* identify routes of blood vessels of the head and neck on a diagram, skulls and patients
* describe landmarks of the maxilla and mandible
* describe origin, insertion and action of the muscles of head and neck
* identify nerve routes to oral cavity and the tissues innervated by each of the nerves of the head and neck
* integrate knowledge of head, neck, and dental anatomy into the clinical practice of patient exams and radiology
* describe the tooth tissues, their location within the tooth, their composition and function
* identify dental anomalies and describe intrinsic and extrinsic factors related to dental anomalies
* list the calcification dates and eruption sequence for the primary and permanent teeth
* differentiate between triangular, transverse, cusp, marginal and oblique ridges and various tooth landmarks
* describe development, form and function of primary and permanent dentitions
* identify primary and permanent dentitions using the Universal and Palmer notation systems
* identify and classify teeth according to class, arch, type and function
* describe root morphology in relation to instrument design and apply concepts of instrument design to root morphology
(3 C: 3 lect/pres, 0 lab)

DEHY 1426 - Oral Histology/Embryology
This course covers concepts of the embryological development of orofacial organs and structures.
Course Outcomes:
* provide the student with a theoretical basis of the development of the head, neck and masticatory system
* identify the embryonic stages and structures in the development of the facial and oral cavity
* describe the growth stages of tooth development
* describe the development of the gingiva and temporomandibular joint
(1 C: 1 lect/pres, 0 lab)

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.
Course Outcomes:
* recognize the theoretical basis of general disease processes including inflammato- and immunity
* identify, describe and differentiate pathology in the oral cavity and on radiographs
* recognize and describe deviations from normal health
* identify common etiologies of neoplasms
* differentiate between benign and malignant oral neoplasms
* describe oral manifestations of nutritional disturbances
* apply differential diagnosis theory to dental patient case studies
* explain how metabolic changes affect the oral cavity
* classify odontogenic cysts and tumors
* describe oral manifestations of systemic diseases
(3 C: 3 lect/pres, 0 lab)

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.
Course 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 it’s 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)

DEHY 1444 - Community Dental Health II
This lecture 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.
Course Outcomes:
* demonstrate theory and practice in instructional methods
* integrate the dental health program at St. Cloud Technical College with other health outreach programs
* plan, develop, implement and evaluate a children’s dental health presentation
* plan, develop, implement and evaluate a dental health presentation for a geriatric population
* create a portfolio consisting of community dental health based data and information regarding alternative dental hygiene careers
* create a pamphlet for consumer use
Prerequisite(s): DEHY1440
(2 C: 2 lect/pres, 0 lab)

DEHY 1448 - Dental Hygiene Radiology II
This lecture/lab 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. Students will also process

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DEHY 1460 - Periodontics
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.

Course Outcomes:
* define and explain periodontitis gingivitis
* describe pathogenesis of periodontal diseases
* explain the histopathology of early, moderate and advanced gingivitis
* describe the mechanisms of tissue destruction caused by bacterial plaque and calculus
* explain periodontal treatment planning and identify treatment modalities
* describe the clinical and radiographic changes characteristic of beginning, moderate and severe periodontitis
* identify and explain radiographic features of alveolar bone
* explain treatment mechanisms and prognosis for periapicalitis, periodontal abscess, periapical abscess, gingival cyst and periodontal cyst
* explain the implications of periodontal disease in patients with systemic diseases
* describe gingival enlargement associated with medications
* explain the importance of periodontal root planning therapy and periodontal maintenance therapy
* describe the AAP classification system used on patients seen in SCTCC dental hygiene clinic
* explain importance and effectiveness of various oral hygiene/plaque control aids to prevent plaque formation
* interpret current scientific journal articles as a resource for information on new treatment techniques and periodontal research
* write abstracts utilizing the criteria outlines in the syllabus from scientific articles

Prerequisite(s): DEHY1418
(2 C: 1 lect/pres, 1 lab)

DEHY 1468 - Pain Management
This course covers pain management techniques used in dentistry. The course will focus on preparing the dental hygiene students 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. Course information will be presented through discussion groups and lab/clinical experience. The laboratory sessions are designed to develop actual experiences in the administration of local anesthesia and nitrous oxide/oxygen inhalation. In the clinical sessions, students will be administering local anesthesia and nitrous oxide/oxygen to fellow students.

Course Outcomes:
* recognize the scientific basis and/or rationale for local anesthesia and nitrous oxide/oxygen inhalation analgesia for pain management
* competently, safely and effectively administer local anesthetic agents to control pain with a minimum of patient discomfort
* competently, safely, and effectively administer nitrous oxide/oxygen inhalation analgesia and to manage associated complications

Prerequisite(s): DEHY1424, DEHY1422
(2 C: 1 lect/pres, 1 lab)

DEHY 1480 - DH Pre-Clinical/Clinical Lab I
This lab course introduces the student to dental hygiene fundamentals, with emphasis on principles of disease transmission, preventive dental aids, data gathering, patient assessment, medical emergencies, dental deposits and entry-level instrumentation techniques.

Course Outcomes:
* demonstrate infection control protocols and techniques during lab and clinical procedures
* explain ethical and legal implications of medical histories and informed consent
* record and interpret patient medical and dental histories
* describe and demonstrate prevention and management of medical emergencies
* perform intraoral and extraoral examinations, interpret and record all findings
* demonstrate and explain usage of mouth mirror, explorers, periodontal probes and scalers
* explain and demonstrate instrument design in relation to crown and root morphology
* explain and demonstrate assembly of slow speed handpieces, straight attachments, prophy angles and contra-angle
* demonstrate cleaning and maintenance of dental instruments, handpieces and equipment
* explain rationale and demonstrate selective mechanical polish
* explain usage and demonstrate various preventive dental aids and adjuncts
* explain and demonstrate topical fluoride application
* demonstrate teamwork and professional rapport with peers, faculty, staff and patients
* chart and record all hard tissue findings and occlusion classification

Prerequisite(s): DEHY1424, DEHY1422
(3 C: 0 lect/pres, 3 lab)

DEHY 1482 - DH Pre Clinical/Clinical Lab II
This course covers pain management techniques used in dentistry. The course will focus on preparing the dental hygiene students 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. Course information will be presented through discussion groups and lab/clinical experience. The laboratory sessions are designed to develop actual experiences in the administration of local anesthesia and nitrous oxide/oxygen inhalation. In the clinical sessions, students will be administering local anesthesia and nitrous oxide/oxygen to fellow students.

Course Outcomes:
* recognize the scientific basis and/or rationale for local anesthesia and nitrous oxide/oxygen inhalation analgesia for pain management
* competently, safely and effectively administer local anesthetic agents to control pain with a minimum of patient discomfort
* competently, safely, and effectively administer nitrous oxide/oxygen inhalation analgesia and to manage associated complications

Prerequisite(s): DEHY1424, DEHY1422
(2 C: 1 lect/pres, 1 lab)
DEHY 1484 - Clinical Dental Hygiene II
This is a supervised clinical experience where students will provide fundamental clinical, preventive educational and therapeutic services to patients. Emphasis on treating periodontal disease, scaling, oral hygiene counseling, radiology and professionalism.
Course Outcomes:
* demonstrate instrument sharpening and maintain sharpness throughout all dental procedures
* demonstrate OSHA infection control standards and universal precautions during all clinical procedures
* demonstrate competency in areas of client communication, assessment, care planning, implementation of care and evaluation of success
* interpret the relationships between oral health and general health and the interrelationships between medical and dental care
* identify the conditions in the personal medical and dental history which contra indicate procedures
* categorize clinic patients using AAP case types
* demonstrate radiographic techniques on patients as prescribed by supervising dentist
* identify and differentiate supragingival and subgingival calculus
* demonstrate a thorough intraoral and extraoral inspection on all dental patients prior to dental treatment
* recognize any abnormality in the oral cavity and record observations according to size, color, character, and location
* describe methods used in clinic to minimize patient discomfort for tissue sensitivity and post-operative care
* assess each patient’s oral hygiene status based on plaque index scores, calculus index and bleeding index
* apply the concept of “selective polishing” to all clinic patients
* complete course requirements at stated competency levels
* demonstrate sharpening of instruments and maintain sharpness throughout all procedures for scaling and root planing
* summarize assessments, observations and procedures performed. Record all pertinent data in client’s progress notes
* implement ergonomic principles during patient and operator positioning
* demonstrate effective communication in area of client OHI counseling
* complete clinical/x-ray assistant rotations
Prerequisite(s): DEHY1480
(2 C: 0 lect/pres, 2 lab)

DEHY 1486 - Clinical Dental Hygiene III
This course is a continuation of Clinical DH II with supervised clinical experiences which includes advanced periodontal therapy, advanced ultrasonic instrumentation, chemotherapeutics and completion of procedural requirements. Clinical application of pain management techniques is also a focus. Radiographic interpretation is incorporated within the radiographic portion of this clinical experience.
Course Outcomes:
* refine clinical competency in areas of client assessment, care planning, implementation of care and evaluation of success
* complete course requirements at stated competency levels
* demonstrate effective communication in areas of client counseling
* prepare the workplace by progression in clinical competency in areas of time management, instrumentation, tissue management and radiography
* prepare for the workplace by incorporating methods used in current dental settings
* correlate the relationships between oral health and general health and the interrelationships between medical and dental care
* assess periodontal clients for advanced periodontal therapy and treatment; determine success/failure of initiated therapies
* evaluate sharpening of instruments and maintain sharpness throughout all procedures for scaling and root planing
* perform methods to minimize patient discomfort for tissue sensitivity and post-operative care
* evaluate pain management techniques on clinical clients
* summarize and record all assessments, observations and procedures in SOAP format
* prepare and present a table clinic for the Minnesota Dental Convention
* complete prison rotations
Prerequisite(s): DEHY1404, DEHY1486, DEHY1468
(6 C: 0 lect/pres, 6 lab)

DEHY 2400 - Dental Hygiene Integrated Board Review
This course is designed as a comprehensive review of dental hygiene in preparation for the National and Regional Board Examinations. It includes discussion and synthesis of dental hygiene theories and clinical applications.
Course Outcomes:
* formulate a plan of action for individual success
* determine individual success on case based test questions
* complete the pilot board to determine areas for extra study
* determine need for stress reduction and methods for control
* determine how individual student needs are met by various assessment tools
* evaluate study strategies for self determination of final grade
(2 C: 2 lect/pres, 0 lab)

DENT 1400 - Dental Sciences
This course is designed to provide fundamental knowledge of embryonic development of the face and oral cavity, oral histology and development of the hard and soft tissues, and terminology related to the oral cavity and teeth. The student will be introduced to the structures and functions of the head and neck as it relates to the oral cavity and dentistry. Characteristics supporting structures are studied. An introduction to basic body systems will also be covered.
Course Outcomes:
* recognize and label structures of the head and neck
* identify the purpose of the various body systems as they relate to the general health of the patient
* describe the development of the face and oral tissues
* identify the contents of the oral cavity

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* define terminology as it relates to the teeth and oral tissues
* note characteristics of individual teeth in the adult dentition

**Prerequisite(s):** READ0304 or Appropriate Accuplacer Score.

(3 C: 3 lect/pres, 0 lab)

**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.

**Course 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)

**DENT 1409 - Preclinical Dental Assisting**

This course will enable the dental assisting student to function effectively as part of the dental health team in medical and dental emergency situations. Evaluating and understanding medical conditions, symptoms, and treatments will be an integral part of this course. The student will be familiar with the fundamentals of pharmacology and the drugs used in dentistry and their effects and interactions.

**Course Outcomes:**
* identify the general concepts involved in pharmacology including types and sources of drugs, reference materials, routes of administration, drug interactions as well as medical abbreviations and symbols used on prescription writing
* familiar with drugs, indications, and contraindications, drug categories and relate them to medical conditions they are associated with
* recognize various medical conditions and demonstrate protocols for managing medical emergencies in the dental office
* identify the objectives of first aid and how they apply to the general rules of first aid in emergency situations

**Prerequisite(s):** READ0304 or Appropriate Accuplacer Score.

(1 C: 1 lect/pres, 0 lab)

**DENT 1412 - 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, bloodborne pathogen standards and hazard communications plans. It will also help to prepare the student to successfully write the ICE examination. This course provides essential background information on methods of sterilization and disinfection, barrier techniques, and infection control standards recommended by OSHA, CDC, Minnesota Board of Dentistry and the American Dental Association. Various types of microorganisms and infectious diseases will be discussed as well as their mode of transmissions. Other topics included in this course include terminology, occupational safety and management of hazardous materials utilized in the dental office.

**Course Outcomes:**
* recognize OSHA, CDC, ADA, and other dental agency standards for operator, patient and personal safety as well as the Bloodborne Pathogens Standards
* function as an infection control assistant in any type of dental office setting
* understand the concepts of cross-contamination and how microorganisms cause disease, types of infections, stages of infectious diseases, and function of the immune system
* process contaminated instruments and disinfect all contaminated environmental work areas according to specified guidelines
* maintain all components of a hazard communications program
* relate potential work-related environmental hazards associated with employment in a dental office

(3 C: 3 lect/pres, 0 lab)

**DENT 1424 - 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.

**Course 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

(2 C: 1 lect/pres, 1 lab)

**DENT 1434 - Dental Materials I**

This course is designed to introduce the student to those materials and techniques utilized for various laboratory and clinical applications. It includes both didactic information and laboratory practice with such products as gypsum, thermoplastic resins, impression materials, waxes and other dental materials. Safety is emphasized.

**Course Outcomes:**
* be aware of and function within OSHA, CDC, ADA, and other dental agency standards for patient, operator, and personal safety
* understand properties of dental materials and how they relate to their manipulation and use
* develop an understanding of the various laboratory and clinical materials
* demonstrate proper manipulation of the various laboratory, impression and thermoplastic resin materials

**Prerequisite(s):** DENT1400, DENT1409

(2 C: 1 lect/pres, 1 lab)

**DENT 1440 - Dental Radiology I**

This course combines lecture and laboratory practice to introduce dental assisting students to the knowledge and skills needed for working with dental radiology. The course introduces students to various full mouth radiographic surveys and provides instruction on the paralleling and bisecting techniques with emphasis on paralleling. Concepts including radiographic anatomy, intraoral and extraoral films, film processing, critiquing skills, quality assurance and infection control are included. Laboratory practice on skills and teaching manikins is provided.

**Course Outcomes:**
* be aware of and function within the OSHA, CDC, ADA and other dental agency standards for operator, patient and personal safety
* identify appropriate radiographic surveys, film types and sizes, and speed of film
* demonstrate periapical, bitewing and occlusal radiographic exposures using a variety of film holding devices while emphasizing the paralleling technique
* demonstrate proper use of the x-ray machine and the automatic processor
* demonstrate acceptable viewing conditions, mounting procedures and record keeping
* critique a full mouth series of radiographs by stating the error and the correction as it relates to exposure, image shifting principles and processing techniques
* interpret the appearance of normal radiographic anatomy, as well as develop mental abnormalities and artifacts
* follow the established quality assurance protocol

**PLEASE NOTE:** All program plans are preliminary and curriculum may change without notice.
* discuss panoramic radiography and other extra-oral radiographic exposures
* produce diagnostically acceptable radiographs on skulls and teaching manikins with appropriate radiation hygiene measures according to the MN Board of Dentistry Prerequisite(s): DENT1400
(4 C: 2 lect/pres, 2 lab)

DENT 1444 - Expanded Functions I
This course will prepare the student to perform the expanded functions that have been delegated to the licensed dental assistant in the State of Minnesota. The course combines lecture and laboratory practice of expanded duties. The development of skills is achieved on typodonts, teaching manikins as well as working on fellow classmates. Course Outcomes:
* be aware of and function within the OSHA, CDC, ADA and other applicable agency standards for patients and the dental health care workers (DHCW) safety, including the Bloodborne Pathogens Standards
* demonstrate competence, to preclinical or clinical levels, as indicated by the Minnesota Board of Dentistry for expanded functions covered in this course
* identify instruments, supplies and equipment associated with performing designated expanded functions
* provide pre-operative and post-operative instructions to dental patients
* be familiar with the ethical and legal ramifications of performing the duties of an expanded functions dental assistant
Prerequisite(s): DENT1400, DENT1409, DENT1412
(4 C: 2 lect/pres, 2 lab)

DENT 1460 - Internship I
This course is designed to allow the first year dental assisting student to transition into the second year by spending time in various specialty and general dentistry practices for observation during the summer between years. Students will spend approximately four (4) hours in each type of specialty office, as well as in both a smaller and a larger dentistry office and a full service dental laboratory. Course Outcomes:
* observe and document OSHA, CDC, ADA and other dental agency standards for operator, patient and personal safety
* recognize basic assisting skills performed by chairside assistants during both four-handed and six-handed dental procedures
* identify Infection Control procedures followed in all types of dental office settings
* be aware of Expanded Functions being delegated to the dental assistant and how they benefit both the patient and the practice
* identify treatments, as listed on an observation form, that are specific to each specialty area
(1 C: 0 lect/pres, 0 lab, 1 other)

DENT 2406 - Dental Health
This course will provide an overview of pathological conditions of the oral cavity. Students will recognize the appearance and maintenance of healthy oral tissue as well as anomalies of the teeth and surrounding tissues. Students will apply their knowledge while presenting group oral hygiene instructions and develop citizenship skills through service learning projects. Course Outcomes:
* recognize pathological lesions of the oral cavity
* recognize anomalies of the teeth and surrounding tissues
* identify the appearance of healthy oral tissue
* recognize the steps and techniques used in an oral examination
* plan and facilitate a group presentation on oral health education
* develop citizenship skills and understand what it means to be a contributing member to the community by completing service learning projects
Prerequisite(s): DENT1424
(1 C: 1 lect/pres, 0 lab)

DENT 2412 - 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. Course 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 employment professional portfolio
* prepare a resume, cover letter and follow-up letter necessary to attain employment
* relate staff/patient interactions as the pertain to the dental business office through the use of role-play scenarios
Prerequisite(s): DENT2424
(3 C: 3 lect/pres, 0 lab)

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. Course Outcomes:
* be aware of and function within the OSHA, CDC, ADA and other dental agency standards for operator, patient and personal safety as well as the Bloodborne Pathogens Standards
* identify instruments utilized in all dental specialties
* select and arrange armamentarium necessary for treatment in restorative dentistry and dental specialties
* demonstrate job entry level competence required for assisting with various dental specialties as they relate to the practice of general dentistry
* apply patient management skills appropriate for each procedure
* provide pre-operative and post-operative instructions to patients
Prerequisite(s): DENT1424
(4 C: 2 lect/pres, 2 lab)

DENT 2440 - Dental Materials II
This course is designed to introduce the student to those materials and techniques utilized for various restorative and clinical applications. It includes both didactic information and laboratory practice with such products as cements, amalgams, bonding agents, esthetic restorative materials, synthetic resins, and provisional restorations. Safety is emphasized. Course Outcomes:
* be aware of and function within the OSHA, CDC, ADA and other dental agency standards for patient, operator, and personal safety
* understand properties of dental materials and how they relate to their manipulation and use
* develop an understanding of the various restorative and clinical materials
* demonstrate proper manipulation of restorative and clinical materials
Prerequisite(s): DENT1434
(2 C: 1 lect/pres, 1 lab)

DENT 2446 - Dental Radiology II
This course combines lecture and laboratory practice to expand on the dental assisting student’s knowledge and skills working with dental radiology. Principles of radiation physics, production and control are discussed. Concepts including radiographic imaging, x-ray characteristics and biological effects are included. Processing skills, radiographic techniques and various darkroom exercises are enhanced. Operator and patient safety procedures are incorporated and the clinical practice is expanded to include patients. Digital radiography is introduced. Course Outcomes:
* be aware of and function within the OSHA, CDC, ADA and other dental agency standards for operator, patient and personal safety as well as the Bloodborne Pathogens Standards...
Pathogens Standards
* understand the components and workings of a dental x-ray machine and how it relates to the production of x-rays
* understand the basic principles and characteristics of dental radiation
* understand factors affecting the quality of the x-ray beam and the radiographic image
* explain dosimetry, the effects of ionizing radiation on living tissue and protection procedures for the patient and operator
* demonstrate darkroom techniques to include maintenance of the automatic processor, duplicating films and troubleshooting poor quality radiographs
* discuss alternate imaging modalities
* produce diagnostically acceptable radiographs on teaching manikins and patients according to the MN Board of Dentistry while demonstrating appropriate radiation hygiene measures
* discuss legal issues relating to dental radiography
* explain supplementary techniques and patient management procedures for those with special needs
* describe roentgenogenesis
Prerequisite(s): DENT1440
(4 C: 2 lect/pres, 2 lab)

DENT 2454 - Expanded Functions II
This course is a continuation of Expanded Functions I and will provide the student with the background knowledge and prepare the student to perform the expanded functions that are legally performed by a licensed dental assistant according to the Minnesota Dental Practice Act. This course combines lecture, laboratory and clinical practice which expand on the dental assisting students’ current knowledge and skills to perform the advanced functions on typodonts, manikins and patients in the dental clinic.
Course Outcomes:
* be aware of and function within the OSHA, CDC, ADA and other dental agency standards for operator, patient and personal safety as well as the Bloodborne Pathogens Standards
* identify instruments, supplies and equipment and prepare tray set-ups necessary for each expanded function
* demonstrate competence to preclinical and clinical levels as indicated by the Minnesota Board of Dentistry for expanded functions covered in this course
* provide pre-operative and post-operative instructions to patients
* be aware of the ethical and legal ramifications of performing Expanded Functions
Prerequisite(s): DENT1444
(4 C: 2 lect/pres, 2 lab)

DENT 2460 - Internship II
This experience will consist of two rotations in different extramural assignments. The first assignment of approximately 6 weeks (160 hour MINIMUM) will be in a general practice or a specialty dental office. The second assignment of approximately 6 weeks (160 hours MINIMUM) will be in a different general practice or a specialty dental office. Students will be expected to work the same hours that the office works. 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. The student is given the opportunity to work with one or more dentists and staff in a real-life situation for each rotation.
Course Outcomes:
* comply with all ADA Accreditation requirements for clinical in a General/Specialty practice
* function as a chairsided assistant and expand skills previously learned in the college setting
* function as a business office assistant and expand skills learned previously in the college setting
* function as a laboratory assistant and expand skills previously learned in the college setting
* demonstrate technical competence, professional attributes and ethical standards during patient care
* manage infection control and hazard control protocols consistent with published professional guidelines
Prerequisite(s): DENT2454, DENT2424, DENT2446, DENT2440, DENT2406
(6 C: 0 lect/pres, 0 lab, 6 other)

DENT 2485 - Internship Seminar
Internship seminar is a pass/fail course that combines the didactic training with the internship experience in preparation for the (DANB) National General Chairside and the Minnesota State Licensure examinations. In coincides with Internship II and provides the opportunity for students to share clinical experiences with their classmates and complete and turn in written reports relating to functions performed in the clinical facility. The course will also provide the necessary information to apply for registration with the State Board of Dentistry and to establish and maintain a professional portfolio.
Course Outcomes:
* complete and hand in weekly time sheets, frequency charts 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 DANB (National 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, DENT2446, DENT2454, DENT2440, DENT2406
(2 C: 2 lect/pres, 0 lab)

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.
Course 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)

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.
Course 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, BLGY2310, BLGY2320
(1 C: 1 lect/pres, 0 lab)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
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 as it relates to the ultrasound examination.
Course Outcomes:
* Identify normal sonographic cross-sectional anatomy and sizes of the abdominal organs
* Describe functions of the abdomen organs
* Identify normal sonographic cross-sectional anatomy and sizes of the neck, musculoskeletal and non-cardiac chest
* Describe functions of the thyroid and parathyroid glands
* Identify normal ultrasound appearances and locations of abdomen vessels
* Describe functions of the abdomen vessels
* Describe normal neonatal brain anatomy and functions
* Identify normal ultrasound appearances of the neonatal head
Prerequisite(s): DMSG1401, DMSG1405
(3 C: 3 lect/pres, 0 lab)

DMSG 1404 - Diagnostic Medical Sonography I
Detailed study of the normal and pathological ultrasound images of the abdomen, thyroid and neonatal head as related to scanning techniques, patient history and laboratory data, transducer selection, and scanning protocols.
Course Outcomes:
* Identify normal and abnormal ultrasound appearances of the abdomen
* Identify normal and abnormal ultrasound appearances of the thyroid and parathyroid glands
* Define pertinent patient history and laboratory data that apply to the abdomen, thyroid and parathyroid
* Describe scanning techniques, transducer selection and scanning protocols of the abdomen, thyroid and neonatal head
* Identify ultrasound artifacts
* Identify Doppler principals of the abdomen and thyroid
Prerequisite(s): DMSG1405, DMSG1401
(3 C: 3 lect/pres, 0 lab)

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.
Course 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
Prerequisite(s): DMSG1405, DMSG1401
(3 C: 0 lect/pres, 3 lab)

DMSG 1408 - Clinical Ultrasound Internship I
This course is designed to provide an initial exposure to several sonography departments in hospitals and clinical settings. Students will observe the role of clinical sonographers in a clinical setting. This course will provide the opportunity to apply didactic knowledge to the clinical environment by observing normal and abnormal sonographic anatomy of the human body. Students will also be scanning in the simulated clinical lab to help them maintain their scanning skills throughout the summer.
Course Outcomes:
* Define the role of the sonographer
* Understand the obligations of the sonographer to patients, institution, and self
* Recognize patient reactions to illness
* Apply infection control and safety measures when working in the lab and clinical setting

DMSG 2402 - 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 technology as it relates to the ultrasound field.
Course Outcomes:
* Describe sonographic cross-sectional anatomy and functions of the male and female reproductive systems
* Demonstrate the normal ultrasound appearance of the gestational sac, embryo, and fetus
* Identify normal sonographic anatomy of the second and third trimester
* Define functions of the placenta
* Describe how to perform sonographic measurements of the fetus during the first, second, and third trimester
* Identify functions of the breast
* Identify normal sonographic appearances of the female breast
* Identify normal sonographic anatomy of the extracranial cerebrovascular and peripheral vascular systems
Prerequisite(s): DMSG1402, DMSG1404, DMSG1406, DMSG1408
(3 C: 3 lect/pres, 0 lab)

DMSG 2404 - Diagnostic Medical Sonography II
Detailed study of normal and pathological ultrasound images of the male and female reproductive systems, obstetrics covering all trimesters, breast sonography and vascular technology as related to scanning techniques, patient history and laboratory data, transducer selection and scanning protocols.
Course Outcomes:
* Describe sonographic technique and protocols used to evaluate the male and female pelvis
* Identify normal and abnormal sonographic appearances of the male and female pelvis
* Describe sonographic technique and protocol used to evaluate the female breast
* Identify normal and abnormal sonographic appearances of the female breast
* Describe 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
* Define obstetric measurements used for gestational age and fetal growth assessment
* List risk factors associated with vascular disease
* Describe sonographic technique and protocol used to evaluate the extracranial cerebrovascular and peripheral vascular systems
* Identify 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, DMSG1440, DMSG1408
(3 C: 3 lect/pres, 0 lab)

DMSG 2406 - 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.
Course Outcomes:

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* demonstrate aspects of patient care pertaining to Ultrasonography
* demonstrate proper ultrasound instrumentation, transducer care and maintenance
* perform abdominal, thyroid, pelvic, obstetric and vascular ultrasound scans following set protocols
* practice scanning on a breast phantom following a set protocol
* describe ultrasound protocol on the scrotum and prostate
* perform various ultrasound measurements following set protocols
* demonstrate the documentation of recording patient history, measurements and technologist comments on an ultrasound technologist worksheet
Prerequisite(s): DMSG1402, DMSG1404, DMSG1406, DMSG1408
(5 C: 0 lect/pres, 5 lab)

**DMSG 2407 - Sonography Board Reviews**

This course will help the student 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.

Course Outcomes:
* apply test taking strategies to successfully complete registry exams and specialty exams
* demonstrate test taking strategies by using mock exams and test review books
* identify testing strengths and weaknesses through self assessment
* perform mock examinations in a simulated exam room
* interpret mock examination results
Prerequisite(s): DMSG2402, DMSG2404, DMSG2406
(1 C: 1 lect/pres, 0 lab)

**DMSG 2409 - Clinical Ultrasound Internship II**

This course is a continuation of Clinical Ultrasound Internship I. The student will focus on becoming proficient in the scanning of the human body under the guidance of registered sonographers in abdomen, superficial structures, pelvis, obstetrics, and vascular systems. Students will broaden and perfect their skills through hands-on participation and observation.

Course Outcomes:
* identify and perform appropriate patient care in a hospital or clinical setting
* understand the day-to-day operations of an ultrasound department
* demonstrate teamwork in an ultrasound department
* perform and observe an examination of any abdominal and pelvic organs, gravid uterus, superficial structures and vascular procedures routinely examined in a diagnostic ultrasound department
* record and process for display the images necessary for a diagnostic ultrasound examination
* interpret ultrasound exams that are performed in an ultrasound department
* demonstrate the ability to identify normal and pathological conditions on a sonogram that are routinely examined in an ultrasound department
* record patient history, measurements, and ultrasound findings on an ultrasound technologist worksheet
* translate ultrasound findings to a reading physician
Prerequisite(s): DMSG2410
(2 C: 0 lect/pres, 2 lab)

**DVRS 1304 - Diversity and Social Justice**

Meets MN Transfer Goals 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. This course can be used in place of GBEH 1300 - Human Relations.

Course Outcomes:
* critically examine and understand their ideas about people, perspectives and experiences that are different than their own, and recognize and explore how their experiences impact how they view others
* learn to examine critically and to challenge unexamined, stereotypical of false beliefs, values and opinions
* critically examine the dehumanizing biases and oppression that various groups in society experience
* gain a beginning understanding of the national debates which provide a societal context in which these behaviors occur (violence and degradation in the media, freedom of speech issues, etc.)
* gain skills in detecting ideological messages and social control in our culture
* critically examine harassment, discrimination and disrespectful behaviors and the misinformation, prejudices, privilege and power that motivate them
* define, recognize and analyze the background and context of individual and institutional classism, racism, sexism, heterosexism, and other forms of oppression
* understand the interrelationships of various forms of oppression

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* describe constructive ways of dealing with conflict and of channeling personal power towards societal change
* develop respectful interpersonal behaviors, personal actions for challenging disrespectful behaviors, discrimination and harassment, and skills in creating a more supportive community for all people

Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

**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.

Course 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

**EAP 0300 - EAP College Writing I**
EAP College Writing I is the first-level course for non-native speakers of English. In this course, students increase proficiency in the writing skills necessary for basic personal and academic communication. Students use process writing techniques to write simple paragraphs, outlines and essays, and gain mastery in the use of the basic structures of the English language while immersing themselves in culturally and contextually relevant writings and readings. This course does not fulfill a general studies or general education requirement. Students with serious writing difficulties can expect to attempt this course multiple times. In order to receive a passing grade at the end of this course, students will submit a writing sample completed in class which demonstrates the focus, development, clarity, and coherence necessary for success in EAP College Writing II.

Course Outcomes:
* use prewriting devices (e.g. brainstorming, outlining, drafting) to compose paragraphs
* write as a way of discovering ideas
* generate, select, develop, and relate ideas coherently
* use the conventions of academic English focusing on writing clear and concise sentences
* write complete simple sentences, compound and complex clauses with basic tenses
* begin to vary writing for different social contexts, readers, and purposes
* work within a community of writers
* demonstrate correct use of paragraph organization and structure by discussing and reading about a culturally and contextually relevant issue and writing a well-organized narrative and expository paragraph
* demonstrate correct use of paragraph unity and coherence by discussing and reading about a culturally and contextually relevant issue, and writing multi-paragraph narrative, comparison/contrast and response papers with thesis statements, topic sentences and conclusions
* employ essay structure in simple and annotated five-paragraph and six-paragraph outlines and write at least one essay
* revise and edit their work for structural, grammatical and mechanical errors
* use basic technology commonly expected in general studies and general education courses including Word, D2L, and peer editing software

(4 C: 3 lect/pres, 1 lab)

**EAP 0301 - EAP College Writing II**
EAP College Writing II is the second-level structure course for non-native speakers of English. In this course, English Language Learners increase proficiency in the writing skills necessary for personal and academic communication. Students use process writing techniques to write multiple-paragraph assignments through short expository, response or researched essays. Students use sophisticated grammar structures in their writings while immersing themselves in culturally and contextually relevant writings and readings.

Course Outcomes:
* select appropriate topics for academic writing
* use the conventions of standard American English in writing complete sentences with appropriate and sophisticated grammar structures and variety
* use writing processes including brainstorming, freewriting, defining and restricting topics, creating thesis statements, developing supporting information, formulating conclusions, revising and editing
* research, read, discuss and respond to academically appropriate reading selections
* write well-developed, focused paragraphs using various methods of development
* write unified, coherent, and well-developed short essays, using various methods of development
* work within a community of writers
* develop skills in summarizing, paraphrasing, and incorporating ideas from other writers into essays without plagiarizing
* use technology commonly expected in general studies and general education courses in a professional manner including internet subscription databases, D2L, turnitin, e-mail, peer editing software, and internet resources

Prerequisite(s): EAP0300 or Appropriate Accuplacer Score.
(4 C: 3 lect/pres, 1 lab)

**EAP 0310 - EAP Listening I**
EAP Listening I is designed to provide non-native speakers of English with the foundational academic listening skills necessary to improve performance at the college level. Students entering this course will have scored between 70-89 on the ESL Accuplacer or between 0-27 on the Regular Accuplacer or will have been identified as expected to benefit by participation in this course. EAP Listening I is intended as a complimentary course EAP Reading I and EAP Writing I so students are encouraged to take all three classes during the same semester.

Course Outcomes:
* listen for main ideas and supporting details
* understand the theme and outline of academic lectures
* apply specific note taking techniques in a lecture
* understand news stories about past, present, and future events
* make/respond to requests and follow/give directions
* employ new words in speaking and writing situations
* use new words encountered in other classes
* utilize study behavior techniques to improve academic performance
* adapt and transfer study skills to a wide variety of learning contexts
* access D2L and other online resources

(4 C: 3 lect/pres, 1 lab)

**EAP 0320 - EAP Listening II**
EAP Listening II is designed to provide non-native speakers of English with the academic listening skills necessary to improve performance at the college level. Students entering this course will have scored between 70-89 on the ESL Accuplacer or between 28-50 on the Regular Accuplacer or will have been identified as expected to benefit by participation in this course. EAP Listening II is intended as a complimentary course to EAP Reading II and EAP Writing II so students are encouraged to take all three classes during the same semester.

Course Outcomes:
* comprehend lectures in academic content areas
* recognize the organization of lecture
* take and organize notes using specific note taking methods
* interpret verbal and nonverbal language markers in a lecture
* predict the content of lectures and evaluate information
* understand elements of natural speech, such as digressions

(4 C: 3 lect/pres, 1 lab)
course emphasizes key atmospheric concepts that enable students to understand
demonstrating 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

EASC 1310 - Meteorology
This course emphasizes 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

EAP 0330 - EAP College Reading I
This is the first course in the developmental sequence of reading for non-native speakers of English. In this preparatory course, students will expand their ability to successfully use reading strategies for success in college courses, with an emphasis on academic vocabulary, cultural context development, and comprehension. Students will explore reading through a variety of materials including novels, newspapers, textbooks, Internet, and technical resources. This course is developmental and does not fulfill a general education or general studies requirement.

Course Outcomes:
* practice reading a variety of texts to strengthen the comprehension and understanding of written materials for success in college classes
* recognize the common roots, suffixes and prefixes of general vocabulary for greater word identification and meaning
* demonstrate usage of the different parts of a textbook for vocabulary and reading comprehension
* develop and apply techniques to manage personal strengths and weaknesses in reading comprehension and in vocabulary building
* respond to and evaluate readings through writing and class discussion
* develop vocabulary at both the receptive and productive levels
* demonstrate understanding of cultural contexts of reading to develop and activate cultural schemata
* develop and apply techniques to manage personal strengths and weaknesses in reading comprehension and in vocabulary building
* respond to and evaluate readings through writing and class discussion
* develop vocabulary at both the receptive and productive levels
* demonstrate understanding of cultural contexts of reading to develop and activate cultural schemata

(4 C: 3 lect/pres, 1 lab)

EAP 0331 - EAP College Reading II
This is the second course in the developmental sequence of reading for non-native speakers of English. In this preparatory course, students will expand their ability to successfully use reading strategies for success in college courses, with an emphasis on active reading, activating schemata, and comprehension development. Students entering this course will have scored between 70-89 on the ESL Accuplacer Test. This course is developmental and does not fulfill a general education or general studies requirement.

Course Outcomes:
* practice reading to strengthen the comprehension and understanding of written materials for success in college classes
* understand and utilize a reading process including tasks used before, during, and after reading
* practice using different patterns of organization commonly used in college-level textbooks to understand meaning
* respond to and evaluate college-level readings through writing and class discussion
* develop critical reading skills
* demonstrate and apply strategies for vocabulary development

Prerequisite(s): EAP0330 or Appropriate Accuplacer Score.
(4 C: 3 lect/pres, 1 lab)

ECON 1310 - Personal Finance
Meets MN Transfer Goal 9 - Ethical and Civic Responsibility. The students will learn what it means to make responsible economic decisions and analyze the social and personal impact on these choices. Techniques for dealing with ethical questions and solutions based on economic consumption in a technology driven society will be identified.

Course Outcomes:
* understand how to improve one’s standard of living based on income, career choice, and time constraints
* examine issues of personal and civic responsibility
* apply ethical standards to economic decision-making
* examine the impacts of short-term and long-term economic decision-making
* collaborate successfully with other students in economic problem solving activities
* examine the concepts of freedom and responsibility as they relate to economic decisions
* examine the connection between personal economic choices and social issues
* demonstrate an understanding of consumer credit and alternatives to accumulating debt
* use economic skills to build a budget and statement of net worth

Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
ECON 1320 - Introduction to Macroeconomics
Meets MN Transfer Goal 5 - History and the Social and Behavioral Sciences. This course is a study of the topics and issues related to economic growth, national income, measurement of economic performance, understanding of economic fluctuations, determination of output, price level, inflation, deficits, knowledge of monetary and fiscal policy, and unemployment in the United States.
Course Outcomes:
* discuss and analyze the difference between microeconomics and macroeconomics
* explain and analyze relationships among economic efficiency, growth and employment
* explain and analyze the laws of supply and demand, and the equilibrium within a market
* discuss and analyze characteristics of the market system, and international trade and currency exchange
* understand Gross Domestic Product
* explain and analyze the business cycle, unemployment, and inflation
* distinguish between income-consumption and income-saving relationships
* discuss and analyze the factors that determine aggregate expenditures
* explain and analyze aggregate demand and supply
* discuss and analyze fiscal and monetary policies and their role within the business cycle
* understand the functions of money and the money supply
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

ECON 1330 - Introduction to Microeconomics
Meets MN Transfer Goal 5 - History and the Social and Behavioral Sciences. This course is a study of the economic topics concerned with individual units such as industries, firms, and households; plus determination of prices and quantities, measurement of costs and productivity, individual markets, specific goods and services, and product and resource prices.
Course Outcomes:
* discuss and analyze the difference between microeconomics and macroeconomics
* explain the nature and methods of economics, and analyze production possibilities
* explain and analyze the laws of supply and demand, and the equilibrium within a market
* discuss and analyze characteristics of the market system
* distinguish between elasticity of demand and supply
* examine consumer behavior and utility maximization
* determine the costs of production
* discuss and analyze pure competition and the impacts of this market structure on economic efficiency
* discuss and analyze pure monopoly and the impacts of this market structure on economic efficiency
* explain and analyze monopolistic competition and oligopoly and the impacts of this market structure on economic efficiency
* distinguish among technology, RandD, and efficiency
* explain and analyze the effects of this market structure on economic efficiency
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

ELEC 1502 - Basic Wiring and Materials I
This course enables you to perform basic wiring of general lighting circuits, switching, receptacles and appliances. Identification of electrical materials and proper installation practices will be carefully evaluated. Service layout and installation calculations will be incorporated with safety habits, tools and romex wiring materials.
Course Outcomes:
* effectively apply safety requirements
* demonstrate circuit calculations and layout
* perform service calculations
* understand and follow National Electrical Code
* maintain professional integrity
(5 C: 2 lect/pres, 3 lab)

ELEC 1506 - Basic Wiring and Materials II
This course will enable students to address and install special lighting, appliances, smoke and fire, low voltage and identify installation methods for spa and pool wiring. Introduction to conduit, wire-mold, PVC and flex wiring systems for installation and safety will be emphasized.
Course Outcomes:
* combine National Electrical Code knowledge with circuit installations
* possess skills for installing raceways and conductors
* perform special circuit installations
* exhibit an ability to calculate conductor, conduit, and box fill requirements
* incorporate service installations with load management
Prerequisite(s): ELEC1502, ELEC1510, ELEC1518, ELEC1522
(5 C: 2 lect/pres, 3 lab)

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.
Course 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)

ELEC 1514 - National Electrical Code II
The student will identify code requirements for the installation of wire, cable, conduit and wiring systems, also boxes, switches, transformers, lighting equipment, motors, and motor controls. Identify hazardous wiring locations. Identify the code requirements for installation of basic wiring.
Course Outcomes:
* utilize the general code requirements for building, outdoors and underground wiring methods
* interpret code tables for the selection of conductors and wiring methods for specific application
* identify and select cable and conduit systems for specific applications
* select proper boxes, switches and other devices to meet code requirements
* identify proper connection and installation of transformers, lighting equipment, motors, and motor controls
* identify hazardous wiring locations
Prerequisite(s): ELEC1510
(2 C: 0 lect/pres, 2 lab)

ELEC 1518 - Applied Electrical Principles and Formulas
This course will enable the student to utilize ohms’ law in the application series, parallel and combination circuits. Calculate voltage current and resistance in these applications. Apply power calculations for circuits. Utilize electrical meters. Apply resistance values in the calculations used for equipment and conductors. Apply magnetic principles to operation of electrical equipment. Describe uses and application of a battery type in industry. Identify basic transformer types and operation. Apply appropriate electrical formulas in solution of electrical problems.
Course Outcomes:
* identify electrical safety issues and act accordingly for personal safety and safety of others
* calculate series, parallel and combination circuits for voltage, amperage, resistance and power using Ohm’s law
* calculate voltage drop and select conductors in compliance with the national electric code
* calculate power usage of electrical equipment
* connect ammeters, volt meters and use of VOM to read circuit values
* identify the most common nominal voltages

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* Identify resistor types and usage in electrical industry
* Identify capacitor types and usage in electrical industry
* Calculate capacitor values
* Identify electromagnetic principles and usage in electrical industry
* Test capacitors and connect into RC circuits for timing
* Identify battery types, functions, complete schematic drawings and usage in electrical industry
* Identify transformer types, functions, complete schematic drawings and usage in electrical industry
* Calculate basic single-phase transformer values for volts, amps, ratio and volt-amp ratings
* Make transformer connections

Prerequisite(s): MATH0380 or Appropriate Accuplacer Score.
(5 C: 2 lect/pres, 3 lab)

**ELEC 1522 - Drafting Blueprint Reading and Specification**

This course teaches students to identify construction design of residential and commercial building. Application of proper symbols and layout of a workable electrical plan along with specifications will enable students to draft a complete set of electrical plans including circuit layout, heating, cooling, and other equipment as required along with the support of a specifications sheet.

Course Outcomes:
* Recognize electrical, plumbing, heating and general construction symbols and details
* Illustrate electrical circuit layout design
* Perform service calculations, sizing and location
* Demonstrate National Electrical Code requirements
* Draft electrically related building code requirements

(3 C: 2 lect/pres, 1 lab)

**ELEC 1526 - Applied Electrical Principles and A.C. Fund.**

This course teaches students to identify differences in DC and AC current. Use trigonometric formulas to calculate voltage, current, impedance values in AC circuits. Identify resistive circuits, pure inductive circuits, resistive inductive circuits, resistive-capacitive circuits, and inductive-capacitive circuits. In-phase and out of phase conditions will be discussed. Calculate leading and lagging power factor. Calculate power factor correction of equipment and feeders.

Course Outcomes:
* Identify electrical safety issues and act accordingly for personal safety and safety of others
* Identify use, connections and modification of meters
* Describe and calculate AC effects on resistive and inductive loads
* Identify and use trigonometric functions in the solutions of AC impedance problems
* Calculate AC voltage values for peak, effective, instantaneous and average values
* Calculate volts, amps, resistance, and power in AC inductive/capacitive series and parallel circuits
* Calculate circuits for power factor correction

Prerequisite(s): ELEC1518
(5 C: 2 lect/pres, 3 lab)

**ELEC 1530 - Electric Heat**

This course will teach students to identify various types of electric heat systems and heat transfer methods. Critical thinking will be applied in calculating heating needs and service load. Students will be required to install and connect various heating controls and electric heat units.

Course Outcomes:
* Possess entry level skills beneficial for an apprenticeship
* Exhibit an ability to calculate and layout electric heat
* Identify electric heat design requirements and components
* Be aware of load management configurations and connections
* Actively demonstrate terminating line voltage and low voltage installations

Prerequisite(s): ELEC1502, ELEC1510, ELEC1522
(2 C: 0 lect/pres, 2 lab)

**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.

Course Outcomes:
* Achieve OSHA 10 certification
* Achieve safety certifications on specified equipment/operations
* Operate tools/machinery according to OSHA outlines practices
* Explore alternative energy options
* Participate effectively in team activities
* Interpret construction blueprints
* Perform basic welds
* Demonstrate safe welding practices

(3 C: 1 lect/pres, 2 lab)

**ELEC 1538 - Industry Skills Development**

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. The student will be responsible for developing a working knowledge of the electrical industry, as well as a personal resume, an example of a cover letter, and interviewing skills.

Course Outcomes:
* Develop team building skills
* Identify thinking patterns
* Identify personal accountability skills
* Organize thinking and learning patterns
* Describe the organization of the Electrical Industry
* Create a working resume, cover letter and other job seeking skills
* Identify and perform examples of community involvement and a humanitarian responsibility
* Evaluate harassment and discrimination issues in the electrical industry
* Describe liability issues in the electrical industry
* Identify “benefits vs wages”
* Participate in the MESA club

Prerequisite(s): ELEC1506, ELEC1514, ELEC1526
(1 C: 0 lect/pres, 1 lab)

**ELEC 2502 - Residential Wiring I**

The student will work on the installation of temporary service and installation of permanent service for a residential dwelling and enhance his wiring skills by the rough-in wiring for a residential dwelling. Job seeking skills will be developed as part of this class.

Course Outcomes:
* Produce a job seeking plan for their careers
* Plan and layout the rough-in of a house
* Install material and use tools and equipment on a house site for a rough-in

(2 C: 1 lect/pres, 1 lab)

**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.

Course 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)

**PLEASE NOTE:** All program plans are preliminary and curriculum may change without notice.
ELEC 2510 - National Electrical Code III
This course will develop a working knowledge of the National Electrical Code in commercial and industrial situations as they apply to chapters 1-4 in the NEC. Students will be given electrical situations and they should describe the minimum NEC standards.
Course Outcomes:
* analyze technical functions of a transformer
* use Trig to solve electrical circuits
* solve practical problems
* participate as a member of a team during lab performance activities
* 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)

ELEC 2526 - A.C. Motor Control II
This course is a continuation of ELEC 2522. Students will examine complex motor control circuits, develop motor control problem solving skills, and design working motor control diagrams.
Course Outcomes:
* 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)

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. Course Outcomes:
* recommend proper lighting
* troubleshoot light problems
* interpret NEC code for lighting
* apply industry standard safety practices
Prerequisite(s): ELEC1506, ELEC1518
(3 C: 1 lect/pres, 2 lab)

ELEC 2514 - National Electrical Code IV
This course will develop a working knowledge of the National Electrical Code in commercial and industrial situations as they apply to chapters 5-9 in the NEC. The student will be given electrical situations and they should describe the minimum NEC standards.
Course Outcomes:
* analyze safety aspects of the NEC
* develop test taking skills
Prerequisite(s): ELEC1514
(2 C: 1 lect/pres, 1 lab)

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, amperages and derating of conductors; develop their pipe bending skills by lab projects in EMT with 1/2 inch and 3/4 inch conduit. MC cable and AC cable lab projects will enhance the students’ knowledge of other wiring installations for commercial wiring.
Course Outcomes:
* bend conduit to industry standards
* apply NEC Code de-rating factors to installations
* recommend proper lighting
* interpret NEC code for commercial applications
* apply industry standard safety practices
Prerequisite(s): ELEC2510
(2 C: 1 lect/pres, 1 lab)

ELEC 2515 - National Electrical Code II
Complete lab projects demonstrating appropriate safety practices
* develop test taking skills
Prerequisite(s): ELEC1515
(2 C: 1 lect/pres, 1 lab)

ELEC 2510 - National Electrical Code III
This course will develop a working knowledge of the National Electrical Code in commercial and industrial situations as they apply to chapters 1-4 in the NEC. Students will be given electrical situations and they should describe the minimum NEC standards.
Course Outcomes:
* participate as a member of a team during lab performance activities
* identify technical (electrical code) jargon and vocabulary
* develop reading comprehension skills
* analyze safety aspects of the NEC
* develop test taking skills
Prerequisite(s): ELEC1514
(2 C: 1 lect/pres, 1 lab)

ELEC 2516 - National Electrical Code IV
This course will develop a working knowledge of the National Electrical Code in commercial and industrial situations as they apply to chapters 5-9 in the NEC. The student will be given electrical situations and they should describe the minimum NEC standards.
Course Outcomes:
* perform calculations of real life examples (as presented in the 1999 NEC)
* determine the safety aspects of the NEC
* organize thought patterns by using the index and glossary of the NEC
* use occupational specific technical vocabulary defined in the NEC
* perform calculations per code from Blueprint information
Prerequisite(s): ELEC2510
(2 C: 1 lect/pres, 1 lab)

ELEC 2521 - Electrical Control
This course will develop a working knowledge of the National Electrical Code in commercial and industrial situations as they apply to chapters 5-9 in the NEC. The student will be given electrical situations and they should describe the minimum NEC standards.
Course Outcomes:
* perform calculations of real life examples (as presented in the 1999 NEC)
* determine the safety aspects of the NEC
* organize thought patterns by using the index and glossary of the NEC
* use occupational specific technical vocabulary defined in the NEC
* perform calculations per code from Blueprint information
Prerequisite(s): ELEC2510
(2 C: 1 lect/pres, 1 lab)

ELEC 2512 - Electrical Control
This course will develop a working knowledge of the National Electrical Code in commercial and industrial situations as they apply to chapters 5-9 in the NEC. The student will be given electrical situations and they should describe the minimum NEC standards.
Course Outcomes:
* perform calculations of real life examples (as presented in the 1999 NEC)
* determine the safety aspects of the NEC
* organize thought patterns by using the index and glossary of the NEC
* use occupational specific technical vocabulary defined in the NEC
* perform calculations per code from Blueprint information
Prerequisite(s): ELEC2510
(2 C: 1 lect/pres, 1 lab)

ELEC 2522 - A.C. 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.
Course 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)

ELEC 2532 - Solid State and PLC Controls
This course will enable you to analyze solid state devices and use the knowledge in a lab to assemble solid state devices such as diodes, rectifiers, filters and transistors. Then the course will develop into PLC basics and eventually complex PLC motor control situations.
Course Outcomes:
* participate as a member of a team during lab performance activities
* complete lab projects demonstrating appropriate safety practices
* analyze the basic solid state devices and identify where they will be found in industry
* program various PLCs
* analyze the basic components of PLCs
* describe fundamental operating procedure of PLCs
* evaluate basic fire alarm control circuits
Prerequisite(s): ELEC2522
(4 C: 1 lect/pres, 2 lab)

ELEC 2533 - National Electrical Code II
This course will examine wiring practices associated with industrial plants and operations. Students will assemble industrial services, bus ducts, and fire alarm systems. The students will also analyze hazardous areas as defined in the NEC, and interpret various job blueprints.
Course Outcomes:
* identify customer relationships and needs
* 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)

ELEC 2528 - 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.
Course 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

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
EMSC 1400 - Principles of First Aid
This is an intermediate and in-depth First Aid course. Topics covered in this course will include: how to recognize a situation needing emergency care, how and when to access the EMS system, and how to care for the victim with and without accessing further medical care. Prevention, medical emergencies and injuries will be the major focus of the course. This course will cover first aid care and treatment of adults and children including Sudden Infant Death Syndrome. This course is taught to the standards of the American Heart Association and the National Safety Council.
Course Outcomes:
* describe how and when to access the EMS system
* identify legal considerations and patient consent
* describe the need for and show proficiency in emergency rescue and moving of victims
* identify urgent care priorities, scene safety and victim assessment
* identify common signs and symptoms, prevention and treatment of common injuries and medical emergencies
(1 C: 1 lect/pres, 0 lab)

EMSC 1404 - First Aid and CPR for Child Care Providers
This is a general First Aid and CPR course. Topics covered in this course will include: how to recognize a situation needing emergency care, how to access the EMS system, and how to care for the victim until help arrives. Prevention, medical emergencies and injuries will be the major focus of the course. This course will cover first aid care and treatment of adults and children including Sudden Infant Death Syndrome. Emphasis is on pediatric first aid. This course is taught to the standards of the American Heart Association and the National Safety Council.
Course Outcomes:
* describe how and when to access the EMS system
* identify steps of prevention, recognition of injuries
* perform CPR and Choking intervention, for adults, children and infants according to the latest standards of the American Heart Association at the Heart Saver level
* describe how and when to access the EMS system
* identify steps of prevention, recognition of injuries
* perform CPR and Choking intervention, for adults, children and infants according to the latest standards of the American Heart Association at the Heart Saver level
* describe the need for and show proficiency in the use of semi-automatic defibrillators
* identify common medical emergencies and describe/demonstrate treatment
* identify common injuries and describe/demonstrate treatment
(1 C: 1 lect/pres, 0 lab)

EMSC 1420 - Basic Emergency Care
This is a general First Aid and CPR course. Topics covered in this course will include: how to recognize a situation needing emergency care, how to access the EMS system, and how to care for the victim until help arrives. Prevention, medical emergencies and injuries will be the major focus of the course. This course will cover first aid care and treatment of adults and children and will include CPR and Sudden Infant Death Syndrome. This course is taught to the standards of the American Heart Association and the National Safety Council.
Course Outcomes:
* describe how and when to access the EMS system
* identify steps of prevention, recognition of injuries
* perform CPR and Choking intervention, for adults, children and infants according to the latest standards of the American Heart Association at the Heart Saver level
* describe the need for and show proficiency in the use of semi-automatic defibrillators
* identify common medical emergencies and describe/demonstrate treatment
* identify common injuries and describe/demonstrate treatment
(1 C: 1 lect/pres, 0 lab)

EMSC 1430 - Emergency Medical Services 1 (EMS1)
Students will be able to apply the fundamental skills and knowledge required to function as an entry level First Responder. Emphasis will be placed on skills needed for the recognition of, and emergency care of sick or injured people, utilizing basic EMS equipment and assisting Emergency Medical Technicians once they have arrived.
This is a Department of Transportation designed course for non-ambulance personnel such as law enforcement, fire, rescue, DNR, industry, and private citizens who are involved in pre-hospital emergency care and are first on the scene in an emergency.
The course is taught utilizing the 1995 US DOT First Responder Curriculum and is approved by and taught to the standards of the Minnesota Emergency Medical Services Regulatory Board (EMSRB).
Upon passing this course the student will be registered with the Minnesota EMSRB as a First Responder. First Responder Certification is valid for two (2) years. This course is approved for Minnesota Peace Officers Standards and Training (POST).
Course Outcomes:
* recognize the seriousness of the patient’s condition or extent of injuries in assessing the requirements for emergency medical care
* demonstrate the ability to administer appropriate emergency medical care for life threatening conditions relative to airway, breathing and circulation
* demonstrate the ability to function safely and effectively as an entry level First Responder
(4 C: 0 lect/pres, 0 lab, 4 other)

EMSC 1432 - Emergency Medical Services 2 (EMS2)
Students will be enabled to apply the fundamental skills and knowledge required to function as an entry level Emergency Medical Technician Basic. Emphasis will be placed on skills needed for the recognition of, and emergency care of sick or injured people, utilizing basic and advanced EMS equipment and assisting Paramedics once they have arrived.
This is a Department of Transportation designed course for ambulance personnel and is also sometimes required by law enforcement, fire, rescue, DNR, industry, and private citizens who are involved in pre-hospital emergency care and are first on the scene in an emergency.
The course is taught utilizing the 1994 US DOT Emergency Medical Technician Basic Curriculum and is approved by and taught to the standards of the Minnesota Emergency Medical Services Regulatory Board (EMSRB).
Upon passing this course the student will be eligible to take the National Registry of Emergency Medical Technicians Basic (EMT-B) exam and the Minnesota Emergency Medical Technician Basic practical exam. Successful completion of both of these exams will certify the student as both a Nationally Registered EMT-B and a Minnesota EMSRB EMT-B. Certification is valid for (2) years.
This course is approved for Minnesota Peace Officers Standards and Training (POST).
Course Outcomes:
* recognize the seriousness of the patient’s condition or extent of injuries in assessing the requirements for emergency medical care

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* demonstrate the ability to administer appropriate emergency medical care for life threatening conditions relative to airway, breathing and circulation
* demonstrate the ability to function safely and effectively as an entry level Emergency Medical Technician Basic
(4 C: 2 lect/pres, 2 lab)

**EMSC 1440 - Emergency Medical Technician Basic (EMT-B)**

This course is required for students who intend to work on a Basic Life Support Ambulance. It is an excellent course for any student wishing to pursue a career in medicine or law enforcement.

This course focuses on recognition and treatment of a variety of medical and trauma patients. It also emphasizes appropriate care for patients in transit to a hospital.

Throughout this course the student will attain their American Heart Association (AHA) CPR for Healthcare Provider card.

Upon successful completion of this course a student will be eligible to take the Practical National Registry of EMT-B’s exam. Successful completion of that exam will allow a student to sit for the National Registry Computer Based Test (CBT). Successful completion of both these exams (along with a state mandated background check) will certify the students as a Nationally Registered and EM SRB certified EMT-B. This course is both DOT and POST approved. Certification is valid for two years expiring on March 31.

If you have questions about the EMSRB mandated check for felonies and misdemeanors please call the EMSRB directly at 651-201-2800.

Course Outcomes:
* recognize the synthesizing patient presentation into a clinical picture of seriousness based on signs symptoms--both initially and after appropriate follow-up
* demonstrate the ability to administer appropriate emergency medical care for conditions related to airway, breathing, circulation, bleeding shock, and other life threatening emergencies
* demonstrate the ability to effectively communicate with co-workers, other health professionals, patients and their families, and first responders
* employ the use of appropriate body substance isolation techniques when performing patient care
* operate safely and effectively as an entry level EMT-B

Prerequisite(s):EMSC1480 currently certified in CPR at the level of Health Care provider by the American Heart Association.

(6 C: 4 lect/pres, 2 lab)

**EMSC 1444 - Emergency Medical Technician Basic Refresher (EMT-B)**

This US Department of Transportation course is designed to review and enhance the knowledge and skills of certified First Responders.

This course is taught utilizing the most current US DOT Emergency Medical Technician Basic Curriculum and is approved by and taught to the standards of the Minnesota Emergency Medical Services Regulatory Board (EMSRB). This US Department of Transportation course is designed to review and enhance the knowledge and skills of certified First Responders.

Upon passing this course the student will be re-registered with the Minnesota EMSRB as a First Responder. First Responder Certification is valid for two (2) years. This course is approved for 16 clock hours of Minnesota Peace Officers Standards and Training (POST).

Course Outcomes:
* recognize the seriousness of the patient’s condition or extent of injuries in assessing the requirements for emergency medical care
* demonstrate the ability to administer appropriate emergency medical care for life threatening conditions relative to airway, breathing and circulation
* demonstrate the ability to function safely and effectively as an entry level First Responder

(2 C: 1 lect/pres, 1 lab)

**EMSC 1464 - First Responder Refresher**

This US Department of Transportation course is designed to review and enhance the knowledge and skills of certified First Responders.

This course is taught utilizing the most current US DOT First Responder Curriculum 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 re-registered with the Minnesota EMSRB as a First Responder. First Responder Certification is valid for two (2) years. This course is approved for 16 clock hours of Minnesota Peace Officers Standards and Training (POST).

Course Outcomes:
* recognize the seriousness of the patient’s condition or extent of injuries in assessing the requirements for emergency medical care
* demonstrate the ability to administer appropriate emergency medical care for life threatening conditions relative to airway, breathing and circulation
* demonstrate the ability to function safely and effectively as a First Responder

(1 C: 1 lect/pres, 0 lab)

**EMSC 1480 - Emergency Cardiac Care**

This course is designed for health care providers. This course will cover how to prevent heart attacks and how to perform CPR in the event that someone does go into respiratory or cardiac arrest or is choking. The course will focus on CPR, stroke and choking procedures for an adult, child and infant one rescuer and two rescuer. The course will then focus on the advanced procedures of two rescuer CPR, including: special situation CPR, special patient CR, cardiac arrest management with integration into the EMS system, infection control, barrier devices, breathing devices and semi-automatic defibrillation.

Course Outcomes:
* describe how and when to access the EMS system
* identify steps of prevention, recognition and risk factors along with treatment of stroke and heart attack
* perform CPR and Choking intervention for adults, children and infants according to the latest standards of the American Heart Association
* perform advanced CPR techniques for the adult and pediatrics to the standards of the EMSRB
* describe the need for and show proficiency in the use of the semi-automatic defibrillators
* describe CPR in special situations

(1 C: 1 lect/pres, 0 lab)

**EMSP 1400 - Paramedicine I**

This is an introductory course for the Paramedicine student reflective of the 1998...
National Standards Curriculum. This course will enable the student to advance in knowledge from their EMT-B education to the advanced roll of the paramedic in topics such as medical-legal issues, roles and responsibilities, communication, personal wellness and the etiology of trauma.

Course Outcomes:
* describe roles and responsibilities of all levels of care within an EMS system and the value of personal wellness, stress management and injury prevention in a health care environment
* describe effective communication with patients and other allied healthcare providers with in legal and ethical boundaries
* integrate pathophysiological principals to form an understanding of the kinetics and kinematics of trauma and the etiology behind any traumatic emergency
* describe safe management techniques at the scene of an emergency with regards to themselves, the patient(s), other allied health care professionals and the public

Corequisite(s): EMSP1402
Prerequisite(s): HLTH1440, BLGY1351
(3 C: 3 lect/pres, 0 lab)

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 skills of the advanced 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.

Course 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

Corequisite(s): EMSP1400
(3 C: 0 lect/pres, 3 lab)

EMSP 1404 - Emergency Pharmacology for Paramedics
This course covers the pharmacology portion of the 1998 National Standards 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.

Course Outcomes:
* define indications, contraindications, dosage, routes of administration, precautions and side effects of various medications used in the emergency setting
* understand the basics of pharmacology including but not limited to drug schedules, pharmacokinetics, pharmocodynamics and drug profiles
* demonstrate the ability to calculate formulas commonly used in medical mathematics

Prerequisite(s): EMSP1400, EMSP1402, EMSP1430
(2 C: 2 lect/pres, 0 lab)

EMSP 1406 - Paramedicine II
This course will cover the Pulmonary and Cardiology portion of module five of the 1998 National Standard Paramedic Curriculum. Emphasis is placed on pathophysiological principals 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.

Course Outcomes:
* demonstrate the cognitive ability to integrate pathophysiological principles and assessment findings to formulate a field impression and implement the treatment plan for the patient with cardiovascular disease
* demonstrate the ability to interpret various types of cardiac arrhythmias and understand the origin and pathology
* demonstrate an understanding of the pathophysiology of the cardiovascular and respiratory systems and functions

Corequisite(s): EMSP1408
Prerequisite(s): EMSP1402, EMSP1430
(3 C: 3 lect/pres, 0 lab)

EMSP 1408 - Paramedicine Skills II
This course is the skills component of EMSP 1406 and EMSP 1404, reflective of the 1998 National Standards Paramedic Curriculum. It will continue to enhance and refine the skills learned in EMSP 1402. 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.

Course Outcomes:
* demonstrate the ability to 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
* demonstrate the ability to effectively manage a traumatic, respiratory and cardiovascular emergency, including cardiac arrest for patients of all ages
* demonstrate the ability to employ advanced invasive procedures when needed to manage a patient's airway, cardiovascular and hemodynamic status

Prerequisite(s): EMSP1400, EMSP1402, EMSP1430
(3 C: 0 lect/pres, 3 lab)

EMSP 1430 - BLS Ambulance Clinical
This course is designed to introduce the student to the BLS and ALS ambulance operations. The student will observe the operations, procedures, and cares provided by the pre-hospital personnel along with performing BLS level skills and advanced patient assessment.

Course Outcomes:
* develop an understanding of the day to day operations of an Advanced Life Support ambulance service
* attain understanding for why out of hospital emergency care exists and the rational for the treatment provided
* demonstrate skills for patient assessment, communication and documentation and basic life support skills

(1 C: 0 lect/pres, 1 lab)

EMSP 1432 - Critical Care Clinical
This course is designed to allow the Paramedic student to refine basic and advanced airway management skills and knowledge along with I.V. 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.

Course Outcomes:
* demonstrate the ability to effectively provide basic and advanced airway management skills and techniques to a variety of patients of all ages
* demonstrate the ability to effectively provide I.V. venipuncture and I.V. therapy on a variety of patients of all ages
* demonstrate ability to perform a history and physical exam and discuss procedures and equipment used to care for the critical care patient

Prerequisite(s): EMSP1408, EMSP1404, EMSP1406
(2 C: 0 lect/pres, 2 lab)

EMSP 1434 - Support Services Clinical
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

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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.

Course Outcomes:
* demonstrate an understanding for invasive and interventional cardiology and how this applies to patients who are treated using these various methods
* demonstrate ability to correlate various heart dysrhythmias to disease pathology and cardiac output
* demonstrate ability to utilize all skills and knowledge acquired to this point to determine pathology of various illness and injuries
* demonstrate ability to 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): EMSP1408, EMSP1406
(2 C: 0 lect/pres, 2 lab)

EMSP 1440 - ALS Ambulance Clinical
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.

Course Outcomes:
* understand the roles and responsibilities of a Paramedic within an EMS system, apply the basic concepts of development, pathophysiology and pharmacology to assessment and management of emergency patients, be able to properly administer medications, and communicate effectively with patients
* establish and/or maintain a patient airway, oxygenate, and ventilate
* take a proper history and perform a comprehensive physical exam on any patient, and communicate the findings to others
* integrate pathophysiological principles and assessment findings to formulate a field impression and implement the treatment plan for the trauma patient
* integrate pathophysiological principles and assessment findings to formulate a field impression and implement the treatment plan for the medical patient
* integrate pathophysiological principles and assessment findings to formulate a field impression and implement the treatment plan for neonatal, pediatric, and geriatric patients, diverse patients, and chronically ill patients
* integrate pathophysiological principles and assessment findings to formulate a field impression and implement the treatment plan for patients with common complaints

Prerequisite(s): EMSP1406, EMSP1408
(3 C: 0 lect/pres, 0 lab, 3 other)

EMSP 2410 - Paramedicine III
This course covers the medical portion of the 1998 National Standard Paramedic Curriculum. Topics covered are Hematology, OB/GYN, Toxicology, Gastroenterology, Neurology, Endocrinology and others. Emphasis is placed on understanding pathology and how this applies to patients who are treated using these various methods.

Course Outcomes:
* describe and explain the etiology behind various types of medical emergencies to include OB/GYN, Neonatal, geriatric, psychiatric and chronic condition patients

Prerequisite(s): EMSP2410
Corequisite(s): EMSP2410
(2 C: 0 lect/pres, 2 lab)

EMSP 2438 - Emergency Department Clinical
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.

Course Outcomes:
* understand the roles and responsibilities of a paramedic. Apply the basic concepts of development, pathophysiology, pharmacology, medication administration, effective communication, assessment, and management
* establish and/or maintain a patient airway, oxygenate, and ventilate
* take a proper history and perform a comprehensive physical exam on any patient, and communicate the findings to others
* integrate pathophysiological principles and assessment findings to formulate a field impression and implement the treatment plan for the trauma patient
* integrate pathophysiological principles and assessment findings to formulate a field impression and implement the treatment plan for the medical patient
* integrate pathophysiological principles and assessment findings to formulate a field impression and implement the treatment plan for neonatal, pediatric, and geriatric patients, diverse patients, and chronically ill patients
* integrate pathophysiological principles and assessment findings to formulate a field impression and implement the treatment plan for patients with common complaints

Prerequisite(s): EMSP2410
(3 C: 0 lect/pres, 3 lab)

EMSP 2442 - Acute Care Clinical
This course includes 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.

Course 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
* take a proper history and perform a comprehensive physical exam on any patient, and communicate the findings to others
* use the appropriate techniques to obtain a medical history from a patient
* explain the pathophysiological significance of physical exam findings
* integrate the principles of history taking and techniques of physical exam to perform a patient assessment
* apply a process of clinical decision making to use the assessment findings to help form a field impression
* follow an accepted format for dissemination of patient information in verbal form, either in person or over the radio
* effectively document the essential elements of patient assessment, care and transport
* describe and demonstrate safe, empathetic competence in caring for patients

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
with behavioral emergencies
* utilize gynecological principles and assessment findings to formulate a field impression and implement the management plan for the patient experiencing a gynecological emergency
* apply an understanding of 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): EMSP2410
(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.

Course 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)

EMSP 2462 - PHTLS Provider
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.

Course 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)

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.

Course 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)

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.

Course 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 post delivery 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

Prerequisite(s): EMSP1406, EMSP1408
(1 C: 1 lect/pres, 0 lab)

EMSP 2480 - Paramedicine Externship
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.

Course Outcomes:
* develop a comprehensive understanding of the pathophysiology of disease and trauma as well as all aspects of ambulance operations and standard operating procedures
* demonstrate out of hospital treatments as a team member and team leader for a vast variety of patient presentations in accordance with the U.S. D.O.T. National Paramedic Curriculum and local protocol
* understand the rational for the treatments rendered and how the treatments alter

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Course Outcomes:
* write well-developed, focused paragraphs using various methods of development
* select, analyze, and use appropriate support from extensive reading materials in essay writing
* understand and evaluate critical reviews
* write critical reviews
* work within a community of writers
* use the conventions of standard English
* understand the correct use of MLA format in documenting sources
* develop critical awareness of one’s own writing and the writing of others
* use technology commonly expected in general studies and general education courses in a professional manner including internet subscription databases, D2L, turnitin, e-mail, peer editing software, internet resources

Prerequisite(s): ENGL0300 or ENGL0306 or ENGL0350 or EAP0301 or Appropriate Accuplacer Score. 

(3 C: 3 lect/pres, 0 lab)

ENGL 0352 - Mosaic Fast Track
Mosaic Fast Track is designed to provide non-native speakers of English with the fundamental academic listening and study skills necessary to improve performance at the college level. Students entering this course will have scored between 50-69 on the ESL Accuplacer Test or between 0-27 on the Regular Accuplacer or will have been identified as expected to benefit by participation in this course. This course does not fulfill a general studies or general education requirement. This course carries institutional credit but will not transfer and may not be used to meet degree requirements.

Course Outcomes:
* listen for main ideas and supporting details
* understand the theme and outline of academic lectures
* apply specific note taking techniques from a lecture
* understand news stories about past, present, and future events
* employ new words in speaking and reading situations
* identify academic and personal goals, outline steps to reach them, and evaluate their commitment to their goals
* identify learning styles and apply the principles to identify and capitalize on their dominant styles
* demonstrate an understanding of the value of identifying priorities and the important role of time management in meeting deadlines and achieving goals
* apply critical and creative thinking to specific problems and challenges they face in classes and in life
* select and apply appropriate memory devices to various kinds of information related to content in college courses
* apply critical thinking to test preparation and test taking
* demonstrate knowledge and use of: D2L, the college's online catalog, electronic access to the SCTCC library resources and databases, the internet for specific information, various search engines and index/directories

(4 C: 3 lect/pres, 1 lab)

ENGL 0355 - Foundations for College Success
This course provides students with preparatory skills necessary for college success including reading, writing and class presentation. In addition, students will cover personally relevant topics of learning styles, study strategies, and group dynamics. Finally students will be introduced to and use technology relevant to their general course work.

Course Outcomes:
* understand and apply learning styles in essay writing
* identify and apply personally relevant study strategies
* produce quality work efficiently in a group setting
* comprehend full length high interest reading selections, ie, novel or novel length non-fiction
* select, analyze, and use appropriate support from extensive reading material in essay writing
* understand and evaluate critical reviews
* write critical reviews
* prepare and deliver a short class presentation
* use technology commonly expected in general studies and general education courses in a professional manner including internet subscription databases, D2L, turnitin, e-mail, peer editing software, internet resources

(3 C: 3 lect/pres, 0 lab)
ENGL 1100 - Writing for the Workplace
This course emphasizes writing skills that have an impact on academic success, personal development and social/cultural involvement. Organization, tone, purpose, mechanics and forms of development are addressed along with general communication issues. Course Outcomes:
* demonstrate correct spelling, punctuation, grammar and sentence structure
* understand the need for professionalism in workplace communication
* analyze written material for purpose, organization, tone and point of view
* demonstrate forms of development
* demonstrate clarity and coherence in writing
* demonstrate planning, writing, revising, and editing
* apply critical thinking skills to achieve clarity, accuracy, precision, depth and fair-mindedness to reading, writing and communication issue
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

ENGL 1302 - Analytical Writing
Meets MN Transfer Goal 1 - Written Communication. This 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.”
Course 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 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(4 C: 4 lect/pres, 0 lab)

ENGL 1321 - Introduction to Modern Fiction
Meets MN Transfer Goal 6 - Humanities. This course is designed to be an interesting survey of modern literature representing the traditional to the avant garde. Students will read, interpret, discuss and write about this literature.
Course Outcomes:
* critically read, analyze, and appreciate representative works of modern fiction
* recognize and use the content, structure and terminology of fiction
* apply perspective gained from literature to personal and global situations using academic writing and oral convention
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

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.
Course 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

ENGL 1330 - American Literature About War
Meets MN Transfer Goal 6 - Humanities. This course introduces students to the history, culture, and social implications of war through the experiences of soldiers and civilians of countries at war. In this class, students will gain a better understanding of the hardships that people endure during wartime and reasons that countries go to war.
Course Outcomes:
* compare and contrast examples of literature about war
* analyze literature about war in relationship to the values, culture and artistic expressions of society
* demonstrate an informed personal response to literature about war
* analyze literature about war as expressions of literature
* analyze literature about was as expressions of humanity’s values within historical periods
* apply critical thinking skills to achieve clarity, accuracy, precision, depth and fair-mindedness to reading, speaking, writing and listening skills
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

ENGL 1340 - Introduction to Multicultural Literature
Meets MN Transfer Goals 6 and 7 - Humanities and Human Diversity. This course provides a broad introduction to multicultural literature. Students will read, discuss, and analyze various types of multicultural literature. Multicultural literature refers to works written by African American, Asian American, Native American, and Latino authors. It can also refer to works that deal with issues of race, gender, class, ethnicity, religion, sexuality, and nationality.
Course Outcomes:
* define multicultural literature
* recognize cultural distinctions
* explore the possibilities and the problems present by cultural diversity
* differentiate types of multicultural literature
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 the present in relation to themselves, their children and their male counterparts.
Course 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, writing, speaking, and listening skills
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

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.
Course 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
* 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

ENGL 1345 - Gender in Literature
Meets Mn Transfer Goal Areas 6 and 7 - Humanities and Human Diversity.
This course explores the portrayal of gender in terms of roles (experience and perspectives) and sexual identity/orientation, and in context of historical, social, and cultural structures and values in literature.
Course Outcomes:
* define literary terms and gender terms
* differentiate types of gender issues in literature
* identify gender themes and issues within literature
* 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
* examine and relate gender themes to culture and tradition
* analyze gender issues in literature as expressions of humanity’s values within historical periods
* examine gender issues as expressions of literature
* analyze/examine literature about gender issues in relationship to the values, culture, and artistic expressions of society
* apply critical thinking to achieve clarity, accuracy, precision, depth and fair-mindedness to reading, speaking, writing, and listening skills
Prerequisite(s): ENGL0304, READ0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

ENGL 2302 - Advanced Argument and Research Writing
Meets Mn Transfer Goal 1 - Written Communication. This is a topic-based course which emphasizes research, critical thinking, organized writing, argumentation and proper documentation of sources while building on skills learned in the freshman composition course. Assignments will focus on using primary and secondary sources to develop writing and analytical skills for in-depth researched argumentative writing.
Course Outcomes:
* understand the ethical issues surrounding plagiarism and avoid such plagiarism
* develop proficiency in finding and selecting trustworthy information from library and internet sources
* enhance skills for drafting, revising and editing
* reinforce documentation and parenthetical citation requirements for researched writing and argument
* develop ability to paraphrase, summarize or analyze primary or secondary sources
* create well-organized, well-supported arguments that acknowledge the many facets of an issue
* formulate your ideas and effectively express those in writing and in group discussion
* adjust writing style for particular audiences and purpose
* recognize argumentative fallacies
Prerequisite(s): ENGL1302 Or Comp I at another college.
(3 C: 3 lect/pres, 0 lab)

ENGL 2310 - Introduction to Creative Writing
Meets Mn Transfer Goal Area 1 - Written Communication. Students will learn the tenets and methods of basic creative writing for poetry and fiction. They will study different genres in both poetry and fiction, and learn to emulate and draw inspiration from these examples. Students should come out of the class with the ability to express themselves through poetry or fiction, and an appreciation for works of the past and present.
Course Outcomes:
* develop the students’ creative thought process and ability to express themselves through writing poetry and fiction
* compare methods of creative writing in a variety of works
* explore methods in their own work
* examine different genres of fiction and poetry
* identify what best inspires them, and how to convey themes to others
* examine their work and those of others in the class
* examine up-to-date studies in the field
* improve their ability to express themselves
* be familiar with and to understand works of the past and present
Prerequisite(s): ENGL1302
(3 C: 3 lect/pres, 0 lab)

ETEC 1507 - Digital Electronics
This is a first course in 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.
Course Outcomes:
* draw and read digital logic and schematic diagrams
* write Boolean logic statements
* read and interpret truth tables
* design and build basic digital logic decision and interface circuits
* design and build basic timing, counter circuits
* design and build basic digital to analog and analog to digital circuits

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* convert between binary, octal, hexadecimal, and decimal number systems
* use a Programmable Logic device to implement a Boolean logic statement

(3 C: 1 lect/pres, 2 lab)

ETEC 1508 - AC/DC Fundamentals I - Modified Course for Tech Prep
This is a foundational course in direct current 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.

Course Outcomes:
* analyze series and parallel DC circuits using Ohm’s law
* measure DC voltage, current, and resistance
* draw and read basic electrical schematic diagrams
* test DC power sources
* select the appropriate size of wire for specific applications
* calculate power consumption and losses in basic electrical systems
* identify and apply appropriate safety procedures

(C: 0 lect/pres, 0 lab)

ETEC 1511 - AC/DC Fundamentals I
This is a foundational course in direct current 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.

Course Outcomes:
* analyze series and parallel DC circuits using Ohm’s law
* measure DC voltage, current and resistance
* draw and read basic electrical schematic diagrams
* test DC power sources
* select the appropriate size of 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)

ETEC 1512 - AC/DC Fundamentals II
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.

Course Outcomes:
* measure single and three phase voltage
* analyze single and three phase capacitor circuits
* analyze single and three phase inductor circuits
* measure phase angles between voltage and current
* draw and read basic electrical schematic diagrams

Prerequisite(s): ETEC 1511

(3 C: 1 lect/pres, 2 lab)

ETEC 1515 - Industrial Safety
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, HAZMAT, tool safety, confined spaces, and others.

Course Outcomes:
* identify appropriate safety procedures in given situations
* read and interpret MSDS sheets
* apply OSHA standards to given situations
* list the steps to be followed for lockout and tagout procedures

(2 C: 2 lect/pres, 0 lab)

ETEC 1521 - Analog Circuits
This course is designed for students who have a good working knowledge of basic AC and DC electricity. The primary goals of this course are to help individuals acquire the knowledge and skills required to analyze and troubleshoot electronic equipment comprised of semiconductor devices and circuits. Individuals will apply these skills through problem solving, simulation, and laboratory exercises and projects.

Course Outcomes:
* draw and read basic schematic diagrams
* identify semiconductor components and terminal connections
* remove and replace components on a two sided printed circuit board
* test regulated and unregulated power supplies
* troubleshoot and repair power switching circuits
* troubleshoot and repair operational amplifier circuits
* test opto-electronic devices

Prerequisite(s): ETEC 1512

(3 C: 1 lect/pres, 2 lab)

ETEC 1523 - Print Reading
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 concept, and machine layout tools to transfer measurements from drawing to stock. Piping and instrumentation diagrams (PandID) will be studied throughout this course.

Course Outcomes:
* explain the purpose of common mechanical drafting equipment including the protractor, compass, scale and angles
* recognize commonly used drafting lines and briefly explain what each line represents
* describe the three principle 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
* perform basic sketching techniques
* explain the basic rules of interpreting a mechanical drawing
* demonstrate a working knowledge of mechanical drafting concepts and practices by accurately drawing a drill gauge
* 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

(3 C: 1 lect/pres, 2 lab)

ETEC 1531 - Instrumentation I
This course covers the fundamental principles of process measurement and control equipment and systems. Students 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.

Course Outcomes:
* describe and apply proper safety procedures for working with process systems
* 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 valves, and pumps
* describe the operation and application of temperature and pressure transducers
* 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 valves, and pumps
* describe the operation and application of temperature and pressure 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

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
ETEC 1541 - Mechanical Systems
This course teaches students the basic knowledge and skills required to install, and maintain pumps, compressors, hoists, rigging and power transmission systems.
Course Outcomes:
* identify basic mechanical drive components
* assemble and disassemble mechanical mechanisms
* perform coupling and shaft alignment
* check and adjust belt and chain drive tensions
* perform vibration analysis
* perform routine maintenance of mechanical mechanisms
* troubleshoot mechanical systems
(3 C: 1 lect/pres, 2 lab)

ETEC 2511 - Fluid Power
This course is an introductory course in Fluid Power. This course is designed for students who have no previous experience in fluid power or hydraulics. The primary goals of this course are to help individuals acquire a practical knowledge of fluid power and hydraulic components and systems and to apply these skills through problem solving, simulation, and laboratory experiments. Topics include: pressure, flow, properties of fluids, fluid conductors, seals, reservoirs, contamination control, actuators, directional control valves, pressure controls, flow controls, proportional and servo valves, pumps, motors, accessories, hydraulic circuits and systems.
Course Outcomes:
* solve practical problems in all topic areas
* install, maintain, adjust, and repair hydraulic components, devices and systems
* perform design and analysis of basic hydraulic systems
* demonstrate and apply critical thinking skills to solve a variety of problems
* demonstrate the ability to work as a member of a team to achieve a common goal, by showing respect for other peoples 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
(2 C: 1 lect/pres, 1 lab)

ETEC 2512 - Hydraulics
This course is an introductory course in hydraulics. This course is designed for students who have no previous experience working with hydraulic systems. The primary goals of this course are to help individuals acquire the knowledge and skills required to install, troubleshoot and maintain hydraulic systems.
Course Outcomes:
* read and draw schematics of hydraulic systems
* plumb basic hydraulic circuits
* connect electro-hydraulic control devices
* interpret hydraulic device specifications
* assemble and disassemble hydraulic components
* perform routine maintenance of hydraulic actuators, control valves, and pumps
(3 C: 1 lect/pres, 2 lab)

ETEC 2513 - Pneumatics
This course is an introductory course in pneumatics. This course is designed for students who have no previous experience working with pneumatic systems. The primary goals of this course are to help individuals acquire the knowledge and skills required to install, troubleshoot and maintain pneumatic systems.
Course Outcomes:
* read and draw schematics of pneumatic systems
* plumb basic pneumatic circuits
* connect electro-pneumatic control devices
* interpret pneumatic device specifications
* assemble and disassemble pneumatic components
* perform routine maintenance of pneumatic actuators, control valves, compressors, and air supply equipment
(3 C: 1 lect/pres, 2 lab)

ETEC 2516 - Mechanical Systems II
This course teaches students a higher level of knowledge and skills required to install, and maintain pumps, compressors, hoists, rigging and power transmission systems.
Course Outcomes:
* identify major components of mechanical drive systems
* disassemble, inspect, refurbish and reassemble mechanical mechanisms
* perform coupling and shaft alignment using the three different procedures
* check and adjust belt and chain drive tensions, along with belt pitch, size, and material
* 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
* understand proper rigging equipment and setup procedures for different applications
* troubleshoot, repair, and analyze mechanical systems
Prerequisite(s): ETEC1541
(4 C: 1 lect/pres, 3 lab)

ETEC 2531 - Instrumentation II
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.
Course Outcomes:
* calibrate temperature, pressure, flow, and level transmitters
* perform routine maintenance on control valves and actuators
* read and draw piping and instrument diagrams
* configure operator interface and data acquisition programs
* configure and install process control loops
* perform loop tuning on basic control loops
* perform routine maintenance on instrument air systems
Prerequisite(s): ETEC1531
(3 C: 1 lect/pres, 2 lab)

ETEC 2541 - Electric Motor Control I
This course provides students with the fundamental knowledge and skills necessary to install, and maintain a variety of single phase and three phase AC motors and AC motor controllers used in industry.
Course Outcomes:
* interpret DC motor specifications
* connect solid state DC drives to DC motors
* read and draw electrical motor control diagrams
* connect reversing DC motor starters
* connect and test overload protection and monitoring devices
* perform routine maintenance on DC motors
Prerequisite(s): ETEC1521
(3 C: 1 lect/pres, 2 lab)

ETEC 2542 - Electric Motor Control II
This course provides students with the fundamental knowledge and skills necessary to install, and maintain a variety of single phase and three phase AC motors and AC motor controllers used in industry.
Course Outcomes:
* interpret AC motor specifications
* connect solid state AC drives to AC motors
* read and draw electrical motor control diagrams
* connect reversing AC motor starters
* connect and test overload protection and monitoring devices
* perform routine maintenance on AC motors

**Prerequisite(s):** ETEC1512, ETEC1531, ETEC2516

(3 C: 1 lect/pres, 2 lab)

**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 PLC's.

**Course Outcomes:**
- * read and draw basic ladder logic diagrams and programs
- * read and 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 a PLC control system

**Corequisite(s):** ETEC2542

**Prerequisite(s):** ETEC2541

(3 C: 1 lect/pres, 2 lab)

**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 is a capstone course that pulls everything together to include problem solving and communication skills.

**Course Outcomes:**
- * perform modifications of existing automated system
- * system maintenance tasks
- * identify systemic problems
- * implement safety systems
- * demonstrate ability to work as part of a team
- * demonstrate effective communication skills

**Prerequisite(s):** ETEC1507

(3 C: 1 lect/pres, 2 lab)

**ETEC 2545 - Networking Systems**

This course covers the foundation of electronic communication networks and the associated wiring and equipment. Networks included are field bus, profibus, ethercat, and divicenet.

**Course Outcomes:**
- * identify types of networks
- * differentiate between different networks
- * test network cables and wiring
- * assemble network cables
- * identify components of a given network

**Corequisite(s):** ETEC1521, ETEC1507

**Prerequisite(s):** ETEC1521, ETEC1507

(2 C: 1 lect/pres, 1 lab)

**ETEC 2546 - Powerplant Technology**

This course teaches basic powerplant technology, powerplant engineering, and energy conversion offered in departments of mechanical engineering and nuclear engineering. The main focus is on fossil and nuclear power plants.

**Course Outcomes:**
- * develop an understanding of thermodynamics
- * understand condensate-feederwater systems and circulating-water Systems
- * principles of powerplant operation
- * understand thermal fission reactors
- * understand nuclear power generation
- * understand alternative power generation
- * understand the environmental aspects of powerplant generation
- * troubleshoot, repair, and analyze powerplant equipment

**Prerequisite(s):** ETEC1512, ETEC1531, ETEC2516

(4 C: 2 lect/pres, 2 lab)

**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.

**Course 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):** ETEC1507, ETEC1521

(3 C: 2 lect/pres, 1 lab)

**ETEC 2552 - Structured Programming Logic for Control Systems**

This course gives students a fundamental understanding of programming structures, procedural and object oriented programming, pseudocode and the use of flow charts. Students will use those structures to implement automated processes and control systems.

**Course Outcomes:**
- * use common programming control structures to develop and implement solutions for automated control problems
- * use pseudocode and flow charts to show the required logical steps of an automated process
- * model professional and responsible behavior by being on time, participating in class discussions and performing assigned tasks on time
- * work as a team to achieve a common goal, by showing respect for other peoples needs, ideas and feelings

(3 C: 2 lect/pres, 1 lab)

**ETEC 2562 - Instrumentation Flex Lab**

This is a capstone course that allows students to expand their knowledge and skills in a specific area of interest. Students may work as an individual or as a member of a 2 person team. Students choose their project, perform the necessary research, design, build, test, demonstrate the working project and submit a written paper about the project.

**Course Outcomes:**
- * model professional and responsible behavior by being on time, participating in class discussions and performing assigned tasks on time
- * work as a member of a team to achieve a common goal, by showing respect for other peoples needs, ideas and feelings
- * apply common safety practices when working with electricity, hand and power tools, and other equipment
- * demonstrate the ability to apply scientific methods to solve technical problems
- * use multiple resources for research
- * demonstrate time management and organization skills by keeping a journal, documenting all project activities and time spent on activities
- * use computers for research, word processing, spreadsheets, simulation and CAD
- * apply technologies to solve practical problems
- * demonstrate effective oral, written and listening communication skills

**Prerequisite(s):** ETEC2540

(3 C: 2 lect/pres, 1 lab)

**FBMT 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, recordkeeping, and business projects to provide the foundation for personal and business management progress. Current issues affecting business management are an integral part of the course.

**Course Outcomes:**
- * maintain production and financial business records
- * interpret business analysis
- * utilize business analysis to improve business organization and efficiency

**PLEASE NOTE:** All program plans are preliminary and curriculum may change without notice.
This course introduces basic farm business management concepts. Students will

- manage risk
(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. The course will emphasize tax planning, completing inputs to livestock and crop enterprises, and emphasize cash and liabilities accuracy. A completed business and enterprise analysis will be the course focus.

Course Outcomes:
- maintain production and financial business records
- demonstrate strategic decision-making skills
- evaluate personal and business goals and plans
- manage risk
(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.

Course 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 and filing, and cash and liabilities checks.

Course 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 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 a number of vehicles such as balance sheets, farm personal and managerial inventories, enterprise reports and historical data.

Course 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 1121 - 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.

Course Outcomes:
- maintain production and financial business records
- 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 1213 - Managing a Farm System in a Global Economy**
This course assists the students in achieving awareness of development in 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.

Course Outcomes:
- demonstrate strategic decision-making skills
- evaluate personal and business goals and plans
- manage business and human resources and technologies
- manage risk
(2 C: 0 lect/pres, 0 lab, 2 other)

**FBMT 1223 - Using System Analysis in Total Farm Planning**
This course enables study of concepts related to farm business analysis, and exploration of possible implications and/or solutions to these concepts. A systematic method to assess farm business strengths and weaknesses based on the analysis will be used.

Course Outcomes:
- 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 risk
(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.

Course Outcomes:
- maintain production and financial business records
- interpret business analysis
- utilize business analysis to improve business organization and efficiency
- demonstrate strategic decision-making skills
- manage risk
(2 C: 0 lect/pres, 0 lab, 2 other)

**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.

Course 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 2142 - Interpreting Trends in Business Planning**
This course examines whole farm, enterprise, balance sheet, and inventory trends.

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

Course 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 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.

Course 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 and human resources and technologies
* manage risk

(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 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.

Course 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 and human resources and technologies
* manage risk

(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.

Course 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 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.

Course Outcomes:
* maintain production and financial business records
* interpret business analysis
* utilize business analysis to improve business organization and efficiency

(4 C: 0 lect/pres, 0 lab, 4 other)

FBMT 2160 - 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.

Course 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 2150 - 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.

Course 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 2140 - 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.

Course 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)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* 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
(2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2205 - 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. Course 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
(2 C: 0 lect/pres, 0 lab, 1 other)

FBMT 2206 - 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. Course 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
(2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2207 - 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. Course 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
(2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2208 - 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. Course 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
(2 C: 0 lect/pres, 0 lab, 2 other)

FBMT 2209 - 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. Course Outcomes:
* maintain production and financial business records

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* 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 2221 - Special Topics - Crops
Analysis of special topics in crop production for students actively engaged in the operation and management of a farm business.
Course 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 2222 - Special Topics - Crops
Analysis of special topics in crop production for students actively engaged in the operation and management of a farm business.
Course 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 2223 - Special Topics - Crops
Analysis of special topics in crop production for students actively engaged in the operation and management of a farm business.
Course 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 2224 - Special Topics - Crops
Analysis of special topics in crop production for students actively engaged in the operation and management of a farm business.
Course 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 2230 - Special Topics - Livestock
This course covers special topics of interest in livestock.
Course 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, 2 other)

FBMT 2231 - Special Topics - Livestock
This course covers special topics of interest in livestock.
Course 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, 2 other)

FBMT 2232 - Special Topics - Livestock
This course covers special topics of interest in livestock.
Course 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, 2 other)

FBMT 2233 - Milker Training School
The objective of this two-day milking school is to provide practical training for dairy farmers and/or dairy employees in the following:
the importance of milk quality, cow handling and behavior, proper milking machine operation and maintenance, effective implementation of mastitis control measures and guidelines for effective treatment, residue avoidance and record keeping, cow comfort and sanitation, effective post milking equipment clean-up, and employment skills.
Course 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 2234 - Special Topics - Livestock
Analysis of special topics in crop production for students actively engaged in the operation and management of a farm business.
Course 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 2235 - Special Topics - Livestock
This course covers special topics of interest in livestock.
Course 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 2236 - Special Topics - Livestock
This course covers special topics of interest in livestock.
Course 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 special topics of interest in livestock.
Course 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)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
FBMT 2238 - Special Topics - Livestock
This course covers special topics of interest in livestock.
Course 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 2239 - Special Topics - Livestock
This course covers special topics of interest in livestock.
Course 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 the way in which both earnings and financial progress can be measured.
Course 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
(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 systems plans and projections, and the interaction of possible implications and/or solutions of these concepts.
Course Outcomes:
* 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 risk
(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 topics will vary depending on student need, location, and time.
Course 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 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.
Course 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.
Course 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.
Course 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

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* 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.
Course 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 skills.
(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.
Course 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.
Course 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
* implement their personal business plan
* create a business plan for their business
* determine the strengths and weaknesses of their business
* develop a mission statement for the continuation of their business
* develop a vision 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.
Course 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.
Course 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.
Course 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.
Course 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.
Course 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.
Course 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.
Course 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)

**FNCR 1205 - Professional Expectations**
Students will identify credit and finance industry expected skills, abilities, and character traits and incorporate strategies to exhibit the ability and willingness to meet the expectations of the credit and finance industry.
Course Outcomes:
* improve decision making/problem-solving skills
* determine priorities and set goals
* budget time, energy, and money
* incorporate the use of daily/weekly/monthly lists of things to do
* compete in credit and finance-related events
* have a positive attitude and be friendly and courteous to others
(1 C: 1 lect/pres, 0 lab)

**FNCR 1206 - Professional Expectations I**
Finance and Credit industry expected skills, abilities, and character traits are identified and discussed. Strategies to demonstrate and document the student’s ability and willingness to meet these expectations are presented.
Course Outcomes:
* describe good decision making/problem-solving techniques
* examine priorities and goals
* explain their time and money management plans
* discuss professionalism
* recognize the importance of ethical behavior
(1 C: 1 lect/pres, 0 lab)

**FNCR 1207 - Professional Expectations II**
Students will learn from experts in the banking, finance, collections, investment, insurance, credit, and real estate industries. Industry presentations will provide students with insight into the current issues of their respective industries and discuss what students can do to be successful in those industries.
Course Outcomes:
* explain the current issues in the various sectors of the finance and credit industry
* recognize their strengths and opportunities for self-improvement as they relate to career success
* prepare and present solutions to simulated business problems
Prerequisite(s): FNCR1206
(1 C: 1 lect/pres, 0 lab)

**FNCR 1208 - Professional Expectations III**
Students will prepare a portfolio demonstrating mastery of the skills, abilities, and character traits required to be successful in the finance and credit industry.
Course Outcomes:
* demonstrate the attainment of the technical skills needed to be successful in the field
* value the kind of attitude and personal characteristics that are expected in the field
Prerequisite(s): FNCR1207
(1 C: 1 lect/pres, 0 lab)

**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.
Course 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 pro-

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FNCR 1240 - Supervision
This course concentrates on the managerial functions of planning, organizing, staffing, leading, and controlling, including goal setting, time management, motivation techniques, communications, problem solving, and decision making.
Course Outcomes:
* explain the current issues affecting supervisory management
* apply decision-making/problem-solving steps
* demonstrate critical thinking skills by writing a strategic plan
* explain the principles of organizing and using scarce resources
* explain the supervisor’s role in employee recruitment, selection, orientation, training, performance and appraisal
* identify commonly used control tools
(3 C: 2 lect/pres, 1 lab)

FNCR 1250 - Credit Law
This course reviews our legal system and contract law covered in BUSM 1275. Focus is then placed on laws dealing more specifically with credit extension, reporting, billing, and collections; bank loan documentation, negotiable instruments, and bankruptcy; real estate, employment, insurance and probate.
Course Outcomes:
* explain the affect of property laws
* explain the purpose of probate law
* demonstrate knowledge of negotiable instruments
* explain insurance contract content
* identify proper documentation for secured credit transactions
* explain the bankruptcy process
* explain legal rights and obligations of employers and employees
* explain contract obligations based on the formation of a business
(3 C: 3 lect/pres, 0 lab)

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.
Course 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)

FNCR 2270 - Collection Techniques
This course covers information regarding regulations as they pertain to collections and the tools and techniques used by credit grantors and collection agencies in skip tracing and collecting.
Course Outcomes:
* describe the importance of being familiar with the client, the client’s service or product, and how the client wants his/her accounts to be collected
* identify the eight steps of a collection call, the skills that contribute to the success of each, and the importance of communication in making collection calls
* discuss and practice, through role playing, common stalls and objectives and effective responses for each
* apply the content of the Fair Debt Collection Practices Act as it relates to telephone collections
(3 C: 2 lect/pres, 1 lab)

FNCR 2273 - Internship
This will be available to students who have demonstrated readiness and willingness to work in an on-the-job situation. It usually will be a training culmination and an opportunity to apply the skills learned.
Course Outcomes:
* apply accounting concepts, principles, and practices
* make good decisions and solve problems
* determine priorities and set goals, budget the required time, energy, and money to reach those goals
* demonstrate good financial management
* understand and follow rules and policies
* make consumer credit decisions by evaluating the applicants credit bureau report and applying the C’s of credit
* demonstrate ethical character traits (honest, fair, dependable)
* understand how laws affect general business transactions including transactions involving creditors, debtors, and depositors
* demonstrate professional appearance (dress and grooming)
* make commercial credit decisions by conducting a financial statement ratio analysis to determine the applicant’s current financial condition and trend
* demonstrate professional behavior (good attitude, friendly and courteous to others)
* use a computer for basic word-processing and spreadsheet applications
* demonstrate good communication skills
* understand how a market economy lets supply and demand automatically redirect societies scarce resources for optimum satisfaction within society
* demonstrate selling skills
* understand the role of money, the banking system, and the federal reserve relative to the level of economic activity (inflation/recession)
* work in teams
* plan marketing strategies
* understand the objectives of depositors, borrowers, and lenders and how their needs are met through the lending process
* understand the importance of professional development
* negotiate the collection of past due debts
(4 C: 0 lect/pres, 0 lab, 4 other)

GBEH 1300 - Human Relations
Analyzes human relationships in social, institutional, and cultural contexts. Analyzes the effects of attitudes, values and beliefs on communication and behavior. Examines the roots of privilege, oppression, and cultural change.
Course Outcomes:
* identify and apply varied communication skills and strategies to improve interpersonal communication
* examine the origins of attitudes, values and beliefs
* examine issues of diversity and social justice
* examine and relate ethical standards to personal and occupational situations
* apply critical thinking skills to achieve clarity, accuracy, precision, depth, and fairmindedness in reading, speaking, writing, and listening in the Human Relations discipline
* value the impact of human relations skills on an individual’s ability to function

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
examine the biological, social, psychological and economic aspects of aging

**Course 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)

**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.

**Course Outcomes:**
- participate in team activities to increase their ability to perform as a team member.
- Activities include: fund-raising, attending meetings, Parade of Homes, Home Shows, goal setting, and Internet search

(1 C: 1 lect/pres, 0 lab)

**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.

**Course 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)

**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.

**Course Outcomes:**
- acquire an increased awareness and knowledge of the interconnectedness 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):** READ0304, ENGL0304 or Appropriate Accuplacer Score.

(3 C: 3 lect/pres, 0 lab)

**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.

**Course 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)

**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.

**Course 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

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

HART 1510 - Sheetmetal
This course will enable you to use sheet metal hand tools, squaring shear and brake to make simple sheetmetal fittings. Students will lay out and make many different sheetmetal projects in residential heating and air conditioning.
Course Outcomes:
* construct duct work
* layout sheetmetal elbows
* assemble sheetmetal duct work
* operate squaring shears and sheetmetal break
(1 C: 0 lect/pres, 1 lab)

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.
Course 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)

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.
Course 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)

HART 1522 - Installation of Heating and A/C
This course will enable you to install furnaces and A/C in residential homes. 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.
Course 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)

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.
Course 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)

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.
Course 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)

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.
Course 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)

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.
Course 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)

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.
Course 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

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

HART 2506 - Commercial Refrigeration I
Students will study fundamental principles of commercial refrigeration. Students will study accessories and perform troubleshooting on commercial applications. Course 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)

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. Course 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)

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. Course 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)

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.

Course 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)

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. Course 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
* 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)

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. Course 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)

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. Course Outcomes:
* determine the operation of a two position control system and proportional control system
* determine the use and operation of limit controls

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
HASL 1404 - American Sign Language II
Review and expansion of basic vocabulary and grammatical structure, conversational practice. Must be taken in sequence.

Course 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): HASL1400
(3 C: 3 lect/pres, 0 lab)

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.

Course 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)

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.

Course 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)

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.

Course 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

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.

Course 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)
This course encompasses the core skills necessary for a transcriptionist. Template construction and use of transcription software are emphasized. Document storage, retrieval, and major editing will be used. The course provides background and practice in transcribing across all medical specialties and types of healthcare facilities. Dictated materials is presented in a variety of formats, including tape, digital, and voice recognition. The ability to proofread accurately is stressed.

Course Outcomes:
* describe the importance of the confidential nature of medical reports
* describe the content and purpose of eight types of medical reports used at a particular medical center
* transcribe documents from the date of admission through the date of discharge or death using correct report format and grammar with 95% accuracy
* identify and/or define the knowledge, skills, abilities and responsibilities required of a medical transcriptionist
* produce documents utilizing digital transmission, tapes and voice recognition
* introduce to dictators with varying English language skills
* apply organization-wide health record documentation guidelines
* maintain the accuracy and completeness of the patient record as defined by organizational policy and external regulations

Prerequisite(s): HITM1228
(3 C: 2 lect/pres, 1 lab)

HITM 1226 - CPT Coding
This 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.

Course 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
* evaluate 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
* define IPPS, RBRVS, payment systems and methodologies

Corequisite(s): HITM1228
(3 C: 3 lect/pres, 0 lab)

**HITM 1227 - ICD Coding**
This course covers the basics of coding with ICD coding system. The course introduces the basic principles, guidelines, and conventions of ICD coding. Coursework includes classification and indexing of diagnoses and procedures for the purposes of standardization, retrieval, and statistical analysis. Coursework will include application of coding principles to actual patient health records and textbook case studies. Students will see encoding software in coding scenarios across all major specialties.

Course Outcomes:
* describe the history and future of the ICD classification system and define the Uniform Hospital Discharge Data Set and Prospective Payment System with 95% accuracy
* evaluate diagnoses and select appropriate ICD codes using the index to diseases and tabular list with 80% accuracy for infectious and parasitic diseases, neoplasms, all major body systems, symptoms, signs, and ill-defined conditions, injury and poisonings
* evaluate all diagnoses for utilization of E and V codes and select the appropriate ICD code(s) using the index to diseases and tabular list with 80% accuracy
* apply knowledge of medical terminology, anatomy and physiology of the human body while evaluating each ICD code
* identify significant co-existing medical conditions and select the appropriate ICD code(s) using the index to diseases and tabular list with 80% accuracy
* use coding resources, including coding software to argue the selection of ICD code upon critical evaluation of the diagnostic information and define the selection based on medical necessity (I.A.2,1.C.8,IV A.3)

Prerequisite(s): HITM1228
(3 C: 3 lect/pres, 0 lab)

**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.

Course 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

Prerequisite(s): HITM1228
(3 C: 3 lect/pres, 0 lab)

**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.

Course 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

Prerequisite(s): HITM1228
(3 C: 3 lect/pres, 0 lab)

**HITM 1240 - Computerized Health Information**
Course covers the basic concepts of an information system and development of life cycle. Discussion of database and data warehouses and their relationship to decision making will be undertaken. Immersion into electronic health records from the aspect of electronic document management systems to comprehensive systems which integrate clinical data from all potential source applications. Standardized healthcare data sets and the data needs for an electronic health record will be reviewed. Security measures to protect organization-wide information systems, measures to protect data integrity and validity using software or hardware technology, contingency planning and data recovery procedures will be introduced. The concepts of integration of computer systems, testing, evaluation and support for organization-wide information systems will be discussed. Within Medisoft, the students will experience an electronic health record, including scheduling appointments and billing applications. Students will experience working in project teams to adopt an EHR for a medical facility.

Course Outcomes:
* explain how the Health Insurance Portability and Accountability Act of 1996 (HIPAA) Electronic Transaction and Code Sets standards relate to insurance claims
* identify the initiatives and framework of the electronic health record, including technologies such as databases, data exchange standards, data retrieval, data capture, clinical decision support, networks and storage technology (IV.C.4)
* use software application to build database employing the elements of data security and data integrity when creating database (IV.D.1, IV.D.2)
* 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
* demonstrate a conceptual understanding of data warehousing, data integrity and validity as applicable to software and hardware technology
* participate in the planning, design, selection, implementation, integration, testing, evaluation, and support for organization-wide information systems (V.E.1)
* investigate the use of audit trails in EHRs (IVD.4)
* investigate the PHR (personal health record) and its integration into EHRs
* experience an EHR environment by working within Medisoft, be able to schedule patients, enter charge transaction and payments based on the chargemaster, and create/edit insurance claims, patient statements, collection letters and collection reports (I.A.3,III.B.6)

(3 C: 2 lect/pres, 1 lab)

**PLEASE NOTE:** All program plans are preliminary and curriculum may change without notice.
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, genetics, and the following body systems: immune, endocrine, respiratory, cardiovascular, neurologic, blood, digestive, renal, and musculoskeletal systems.
Course Outcomes:
* understand the mechanism of disease
* understand how and why alterations in body structure and function lead to the signs and symptoms of disease
* describe and distinguish between the etiology and pathology associated with common diseases of the above-mentioned body systems
* identify treatment modalities, including surgical intervention, immunotherapy and radiological techniques for specific conditions
* apply medical terminology pertaining to diseases, injuries, and abnormalities of the human body
* introduce the latest treatment for diseases and disorders
* understand how genetics plays a role in many common disorders
* introduce diagnostic tests for disease processes
Prerequisite(s): HLTH1444
(3 C: 3 lect/pres, 0 lab)

HITM 2206 - HIT Professional Practice Experience
This course emphasizes interaction between the student and PPE supervisor with emphasis on the supervisory role. Human relations and working within a team environment are emphasized. This is the capstone course for the program; course should be completed during the student’s final year. Student must have a cumulative GPA of 2.5 or greater. Students will also participate in 30 hours of virtual coding experience.
Course Outcomes:
* apply organizational health record documentation guidelines
* accept responsibility for HIT job functions and personal behavior while at the Professional Practice Experience facility
* apply policies and procedures in compliance with regulations of the PPE facility
* follow confidentiality policies and procedures consistent with the Professional Practice Experience
* promote ethical standards of practice
* maintain the accuracy and completeness of the patient record with minimal supervision
* follow the safety guidelines of the PPE facility
* work with a variety of providers and disciplines while at the PPE facility
* follow guidelines as applicable to release of patient-specific data while at the PPE facility
* work smoothly on a computerized network with minimal supervision
* apply the knowledge of database architecture to meet PPE facility needs with minimal supervision
* comply with department security policies while at the PPE facility
* work within the team environment while at the PPE facility
* prioritize job functions and activities with minimal supervision
* contribute to work policies and procedures in relation to job function while at the PPE facility
* project good company image while assisting patients via telephone
* perform most HIT functions with little or no supervision
(3 C: 0 lect/pres, 0 lab, 3 other)

HITM 2212 - Quality Improvement and Healthcare Statistics
This course covers the components of quality improvement systems using practical tools for problem-solving, decision-making, time management, and implementation of quality concepts. Activities that provide the process of reviewing and evaluating health care services will be examined as well as topics related to utilization review and risk management will be explored. This course is also a study of collecting, analyzing, interpreting, and presenting numerical data relating to health care services.
Course Outcomes:
* define a sentinel event vs. near-miss and their impact on quality healthcare
* define critical care pathways and their impact on quality healthcare
* discover the impact of quality outcomes on cost-effective healthcare
* discuss the selection of data collection tools, such as brainstorming, fishbone, rank order, etc.
* create a storyboard to portray data and outcomes of study
* define and compute commonly-used healthcare statistics
* define minimum data set criteria and its impact on quality of care
* abstract data from secondary databases
* critically evaluate abstracted data as to relevance and significance to project
* discuss basic research principles, including IRB policies and procedures
(3 C: 3 lect/pres, 0 lab)

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.
Course 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 steps of systems analysis and design process
* develop policies, procedures, and identify areas of improvement based on HIM functions (I.A.3)
* identify key activities associated with human resource management
* understand the continuum of employee training and prepare training/development plan relative to HIM department
* describe financial management functions of HIM professionals, including chargemaster, budgets, and budget reconciliation
* describe and apply the elements of project management, including the use of software for data collection, data storage and data reporting (IV.A.1)
Prerequisite(s): HITM1225
(3 C: 3 lect/pres, 0 lab)

HITM 2220 - Legal Aspects of Health Information
This course covers the fundamental aspects of legalities within the healthcare settings. Topics of study include patient/physician relationship, professional liability and medical malpractice, duties of the physician, confidentiality, and HIPAA. The course discusses contracts, consent forms, Medical Practice Acts, Uniform Anatomical Gift Act, and other statues related to the healthcare field. The course introduces professional approaches to ethical and bioethical issues, including genetic engineering, quality of life, and choices in life and death. Models for examining ethical dilemmas are explored.
Course Outcomes:
* identify the different types of courts in the legal system
* explain the trial process and differentiate between civil and criminal law
* describe the difference between licensure and certification
* distinguish appropriate conduct for healthcare personnel
* apply medical ethics as relevant to patients, doctors, and the sustaining relationship (III.B.7)
* summarize Patient’s Bill of Rights
* explain the difference between implied consent and informed consent

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* restate the aspects of professional liability and medical malpractice
* explain Good Samaritan Laws
* discuss and apply federal regulations affecting the medical profession
* define and discuss the legal components of a medical record vs. legal record
* apply ways to protect patient confidentiality
* describe and apply the ethical-decision making model when making difficult ethical decisions
* analyze ethical issues relating to life as in genetic testing, research, sterilization and contraception
* identify the five stages of dying as described by Dr. Kubler-Ross
* identify HIPAA and the penalties for noncompliance
Corequisite(s): HITM1225
(3 C: 3 lect/pres, 0 lab)

HITM 2224 - Advanced Medical Coding
This course is a continuation of previous coursework in CPT and ICD coding. This course will provide more complex cases to allow the student to coordinate CPT, HCPCS, and ICD coding in diverse healthcare setting and across all major specialties. The application of coding principles will include coding patient health records and case studies to develop proficiency and to apply advanced concepts of coding. Reimbursement methodologies, including analysis of claims denials, will be covered. Students will use computerized encoding software, including DRG assignment to coding scenarios.
Course Outcomes:
* apply CPT, HCPCS, and ICD codes to clinic outpatient services, procedures, and visits
* abstract office visits, consultations, hospital discharge summaries to apply appropriate E/M codes for these events
* extrapolate pertinent information from clinical documents relevant to assigning insurance codes
* apply medical terminology pertaining to disease, injuries and abnormalities of the human body
* discriminate between third party payer differences and apply coding guidelines (ICD, CCE edits, and others) to analyze and rework claim denials (I.D.2, III.A.3, V.B.3)
* argue the selection of CPT, ICD, and HCPCS upon critical evaluation of the diagnostic information
* apply appropriate modifiers to the code selection
* understand the uses of these classification systems, including reimbursement monitoring and reporting (1.C.7)
* verify the completeness of data and data sources for the billing process
Prerequisite(s): HLTH1444, HITM1226, HITM1227
(3 C: 3 lect/pres, 0 lab)

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. Course 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)

HLTH 1402 - Nursing Assistant
The student will be introduced to concepts of basic human needs for a variety of populations, safe environment, emergency measures and basic nursing skills. Skills are performed in a supervised laboratory and clinical setting. This course is intended to prepare students for employment as Nursing Assistants. The Federal and State OBRA laws and MN Department of Health requirements are met in this course.
Course Outcomes:
* focus on the Nursing Assistant as an important team member providing a needed service to the community
* introduce a mind, body, and spirit approach to care for residents of many cultures/beliefs/religions
* summarize acceptable behavior, which complies with the Resident Bill of Rights, Vulnerable Adult Act, ethics and etiquette
* discuss effective communication and observation skills through conversation, active listening and gathering of facts related to resident’s care
* demonstrate basic nursing skills as identified in the procedure checklist
* develop an awareness of safety needs for the Nursing Assistants and the residents
* examine the importance of adequate food and fluid balanced with elimination
* examine the process of death and dying related to resident’s care needs
* identify situations requiring emergency action and appropriate follow through
(3 C: 2 lect/pres, 1 lab)

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.
Course 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)

HLTH 1430 - Introduction to Health Careers
This course will focus on information essential to the success of the healthcare technician at SCTCC. Discussion of working with others, communication skills, legal and ethical responsibilities, cultural considerations in the healthcare industry, problem solving, decision making, and basic college skills will be provided. This course will equip students to develop skills helping them to accept personal responsibility, self-management and self-awareness. It will also provide an introduction and review of a variety of health care careers and their respective work settings to the beginning health care student. An overview of health occupations will provide a foundation from which the student will be able to decide upon furthering their health care career plans and goals.
Course Outcomes:
* identify and describe personal qualities and commitments of a health care worker
* demonstrate interpersonal relationships and communication skills
* discuss legal, ethical responsibilities, and personal boundaries of a health care worker
* discuss basic problem solving and decision making skills
* identify personal responsibility and its relationship to outcomes and experiences
* demonstrate self-management to make purposeful actions in pursuit of goals
* develop self-awareness of behaviors and attitudes which attribute to success as a college student
* describe steps in preparing for service learning
* discuss the healthcare programs available at St. Cloud Technical and Community College
* identify different health care career options
(2 C: 2 lect/pres, 0 lab)

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. Course Outcomes:
* define and pronounce medical terms
* identify medical prefixes/root words/suffixes

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
This course is an introduction to the basic principles of nutrition. This course provides instruction on the principles of assessing, diagnosing, planning, implementing, and evaluating total care of clients and helps the student contribute to the nutritional well-being of clients.

Course Outcomes:
* describe the basic principles of nutrition
* explain the rationale for sound nutrition principles in assessing, diagnosing, planning, implementing, and evaluating total care of clients
* relate the importance of the nutritional well-being of clients
* 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
* relate the effects of nutritional status to systemic diseases such as diabetes, heart disease, cancer, eating disorders, renal and liver disease

Prerequisite(s): READ0304 or Appropriate Accuplacer Score. (2 C: 2 lect/pres, 0 lab)

**HLTH 1484 - Ethics for Health Careers**

This course prepares health and human service students and graduates for situations they will face in their professional lives that have an ethical component. The students will learn basic ethical theory and concepts. This theory will be used as they apply practical approaches to identify and deal with common problems in their chosen fields.

Course Outcomes:
* identify the basic concepts of ethics
* apply the basic concepts of ethics to common problems in their chosen field
* distinguish between ethical situations and ethical problems
* implement problem solving principles in ethical decision-making
* differentiate between “confidential information” and “confidentiality”
* list and evaluate six guidelines that can help a professional to respond more constructively to a patient
* define peer review and assess its usefulness
* identify the ethical norms present in ethical dilemmas related to allocation decisions

Prerequisite(s): READ0304 or Appropriate Accuplacer Score. (2 C: 2 lect/pres, 0 lab)

**HPER 1310 - Life Wellness**

This course is designed to provide the groundwork for students to be able to design their own total fitness program. This course provides information that is relevant to each person’s particular fitness goals, showing students how to alter their programs as their fitness needs change. Individual physical limitations, weight problems and cardio-vascular fitness levels are all significant parts of this course design.

Course Outcomes:
* define Wellness and Fitness and describe parameters that comprise good physical health
* explain why CV endurance is the most important component of fitness and how the main energy systems contribute to various forms of physical exertion
* determine body composition and explain the importance of a desirable ratio of lean to fat body tissue
* describe the benefits of having reasonable flexibility and how it relates to low back pain
* understand the overload principle and how one maintains appropriate muscle strength and/or endurance throughout one’s lifetime
* design a diet that conforms to a healthy lifestyle
* discuss the major lifestyle behaviors that are associated with heart disease and how to reduce one’s risk
* identify the risk factors and warning signs for various forms of cancer, diabetes, and osteoporosis
* explain the role of heredity, exercise and diet in weight control
* describe how the body responds to stress, identify potential stressors and establish strategies to reduce stress
* design a personal program for developing and maintaining a healthy lifestyle

(2 C: 1 lect/pres, 1 lab)
* 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: 0 lect/pres, 0.5 lab, 0.5 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.

Course Outcomes:
* realize the origins of water contaminants
* understand the relationship between the atomic structure of a water contaminant and its behavior
* use 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)

HPWT 2504 - Reverse Osmosis Principles
Reverse Osmosis (OR) principles develop 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.

Course 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)

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.

Course 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
* develop methods for breaking down and characterizing RO system performance
* apply methods for analyzing RO system problems

(2 C: 2 lect/pres, 0 lab)

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.

Course 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/scalced RO system

(2 C: 2 lect/pres, 0 lab)

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.

Course 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)
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.

Course Outcomes:
- understand how bacteria are able to survive and propagate in different environments
- 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 the potential of ultraviolet light as a bacterial control method
- 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)

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.

Course 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 system
- 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
- 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)

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.

Course 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 feed-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)

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.

Course 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)

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 achieving even higher purity effluent water in the EDI process.

Course Outcomes:
- understand the relationship between ion 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 ion conductivity
- quantify the ionic movement processes using Faraday’s Law when given a quantity if 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)

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

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.
Course 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)

HPWT 2526 - Deionized (DI) Water Principles
Deionized (DI) Water Principles develops an understanding of the nature of deionized (DI) water, how it is created, and how it is used. It includes a discussion of the various DI water requirements from different industries, 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.
Course 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)

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.
Course 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)

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.
Course Outcomes:
* recognize the importance of scheduled instrument calibrations
* apply particular measurements to the identification of DI equipment concerns
* 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)

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.
Course 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)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
HUMN 1320 - Holocaust and Genocide Studies
Meets MN Transfer Goal Areas 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. Course 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

HUMN 1300 - Introduction to the Humanities
Meets Mn Transfer Goal Area 6 - Humanities. Introduction to Humanities allows students to explore, celebrate, and experience the human need to create thought, visual and performing art, literature, and architecture. Course Outcomes:
* develop and communicate a basic understanding of the disciplines included in the humanities
* develop and communicate an understanding of the human need to create
* hone critical opinions of creative works of visual and performing artists, writers, and thinkers
* examine the creative impulse documented in biographies and/or autobiographies of selected artists, composers, architects, writers and/or philosophers
* create and present original works including but not limited to, photography, collage building, architectural design, musical composition, poetry and fiction writing
* document and analyze decisions made during the creative process
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

HUMN 1340 - Middle Eastern Cultures
Meets MN Transfer Goal Areas 6 and 8 - Humanities and Global Perspectives. This course will explore and examine a number of Middle Eastern cultures. It focuses on central characteristics, beliefs, and insights, which have shaped their values, practices, and aspirations over the centuries. Course Outcomes:
* examine the dynamics of living cultures
* analyze the influence of religion, environment, and other factors on Middle Eastern cultures
* examine cultural conditioning
* examine the philosophical viewpoints and arguments developed within the Middle Eastern cultures
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

HUMN 2350 - Film and American Culture
Meets MN Transfer Goal Area 6 - Humanities. This course examines contemporary American culture and society through film. We will investigate the culture in which we live and the movies our culture produces. By watching, discussing, and writing about these films, we will examine how motion pictures create a window into modern American society. Course Outcomes:
* gain a working knowledge of American film history
* develop cinematic literacy
* understand how the technology of movies relates to film
* explore the place of Hollywood film in American popular culture
* understand the role of genre in American film history, and the relationship between genre and American social history
* understand how the concept of “realism” relates to motion pictures
* question our roles as passive spectators and to develop the ability to think critically about popular culture
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

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 first hand. Course 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(1 C: 1 lect/pres, 0 lab)

ICVT 1402 - Cardiovascular Anatomy and Physiology
A study of the anatomy, physiology, and structural relationships of the human heart and vascular system. Focus on hemodynamics and electrocardiography. Course 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
* given a diagram of an EKG complex, identify the waves, intervals, and segments, and describe their significance
* given EKG rhythm strips, identify the arrhythmias and describe their significance
Prerequisite(s): BLGY2310
(4 C: 3 lect/pres, 1 lab)

ICVT 1422 - Cardiovascular Instrumentation
A study of concepts that serve as the foundation for the cardiovascular technology field. Topics include basic electricity and electrical safety, physiological monitoring instrumentation, x-ray tubes and bio-effects of radiation. Course 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
* 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

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
ICVT 1423 - Catheterization Lab Fundamentals I
This course focuses on the cath lab procedures, scrub and circulate, equipment set-up, hemodynamic monitoring, and the coronary angiography procedure itself. Course Outcomes:
* define selected terms related to cath lab procedures, hemodynamic monitoring, and coronary angiography
* analyze hemodynamic data and calculate valve area for both aortic and mitral valves
* analyze oxygen saturations for shunt detection studies
* 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
Corequisite(s): ICVT1443
Prerequisite(s): ICVT1422
(2 C: 2 lect/pres, 0 lab)

ICVT 1440 - Introduction to Clinics
Topics address patient scheduling, patient preparation, patient histories, and physical signs. Lecture and simulated laboratory experience prepares the student to perform patient care utilizing critical thinking and clinical skills. Course Outcomes:
* describe the safety concerns for patients and health care workers
* list the components of good body mechanics
* describe the correct patient-transfer methods
* 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
* define and implement patient confidentiality
(1 C: 1 lect/pres, 0 lab)

ICVT 1443 - Cardiovascular Clinic I
Introduction to the aspects of cardiac cath lab in a hospital or simulated clinical laboratory setting. Emphasis placed on instrumentation, entry-level scrub/circulate, and lab set-up. Course 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 gloving 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
Prerequisite(s): ICVT1422
(5 C: 0 lect/pres, 5 lab)

ICVT 2405 - Cardiovascular Pathology
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. Course 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 selected 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
Prerequisite(s): ICVT1402
(3 C: 3 lect/pres, 0 lab)

ICVT 2426 - Catheterization Lab Fundamentals II
A continuation of Catheterization Lab Fundamentals I with emphasis on pharmacology, advanced cardiovascular diagnostic and therapeutic procedures, percutaneous coronary intervention procedures, and cardiac surgical procedures. Course 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 Tech’s 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 Tech’s role in electro-physiology studies, temporary and permanent pacemaker procedures
* discuss the use and function of an intra-aortic balloon pump
Corequisite(s): ICVT2446
Prerequisite(s): ICVT1423,
(4 C: 4 lect/pres, 0 lab)

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. Course 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,
(5 C: 0 lect/pres, 5 lab)

ICVT 2450 - Applied Clinical Internship
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. Course 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 professional-
ism, courtesy to patients and clinical staff, and a willingness to learn
Prerequisite(s): ICVT2426, ICVT2446
(13 C: 0 lect/pres, 0 lab, 13 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 op-
portunities 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.
Course Outcomes:
* recognize how to take personal responsibility, gaining greater control over the
outcomes and experiences created both in college and in life
* contrive greater inner motivation by discovering their own personally meaning-
ful goals
* identify and employ numerous strategies for taking control of their time and
energy, allowing them to move more effectively and efficiently toward the ac-
complishment 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 off-
ered 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)

INTS 1160 - Academic Foundations
This course is designed as a foundation course for student success in college.
Through a structured curriculum, students will become acquainted with the ser-
vices and resources of St. Cloud Technical College and the tools and skills neces-
sary to be successful in college. Through these services, resources, tools, and
skills, students are empowered to take ownership and control of their academic
and personal life outcomes and experiences.
Course Outcomes:
* define methods and tools for student success
* recognize skills necessary for student success
* identify and locate support services and resources
* set, outline/write, and continually appraise individual goals regarding personal
and academic plans
* identify and draw personal conclusions about success strategy skills and at-
titudes
* put into action success strategies by utilizing tools presented (learning styles
inventory, D2L/online venue, college planner, and so on)
* access support services and resources necessary in personal and academic plan
* identify and investigate various academic program offerings
* assess and prioritize commitments to maximize college success
* synthesize identified services, resources, tools, and skills for individual success
(3 C: 3 lect/pres, 0 lab)

LEGL 1201 - Paralegal Basic Law I
This course presents the fundamentals of paralegal skills needed to succeed in the
workplace including paralegal and attorney ethics and professional responsibility;
elements of sources of American law; the court system; introduction to tort law,
product liability, consumer law, contracts, intellectual property law, insurance
law, real property, alternative dispute resolution; constitutional law, and Supreme
Court opinions.
Course Outcomes:
* explain the duties and responsibilities of a paralegal
* describe the general organization of the federal and state court system
* explain the basic process and procedure of civil law
* examine and define statutory law, administrative law, tort law, insurance law,
contract law
* demonstrate an understanding of constitutional law
* read and interpret case law
* discuss and apply ethical standards regarding paralegals and attorneys
* identify and analyze unauthorized practice of law
* apply legal writing form and substance rules
(4 C: 4 lect/pres, 0 lab)

LEGL 1202 - Paralegal Basic Law II
This course presents an introduction to administrative law and government
regulations; forms of business organizations; employment law; bankruptcy law
and reorganizations; civil litigation; conducting interviews and investigation;
trial procedures; criminal law and procedures; constitutional law; Supreme Court
opinions, and legal research and analysis.
Course Outcomes:
* explain the basic process and procedure of civil litigation
* demonstrate an understanding of criminal law and procedures
* understand development of a trial preparation notebook
* examine and define wills, trusts and estate law, family law, laws affecting busi-
ness, bankruptcy and environmental law
* demonstrate an understanding of constitutional law
* read and interpret case law
* demonstrate a basic understanding of legal research
* apply legal writing form and substance rules
* discuss and apply ethical standards regarding the law
(4 C: 4 lect/pres, 0 lab)

LEGL 1203 - Legal Research and Writing
This course will provide a comprehensive working knowledge of and an under-
standing of the research materials, research tools, research strategies and other
skills necessary to write legal memoranda in order to assist attorneys to write
briefs and other legal research-based documents. Students will be instructed to
use a law library to locate and use both primary and secondary research data,
to use Westlaw or LexisNexis legal research sources to solve legal problems,
including federal and state cases, digests, statutes, regulations, treatises, ency-
locales, law reviews, citators and practice works.
Course Outcomes:
* identify and define the terminology associated with legal research
* recognize, identify, locate, and apply primary and secondary legal sources
* acquire Westlaw certification
* identify the steps necessary to research a legal issue by retrieving relevant
primary and secondary print and electronic sources of law
* apply research and library skills to data collection and research methodology;
* demonstrate competencies in using research tools
* find and interpret the various federal and state cases, digests, statutes, regula-
tions, treatises, encyclopedias, law reviews, citators and practice works
* demonstrate the ability to apply cases to legal writing; use mandatory and
persuasive authority to validate written legal documents
* demonstrate the ability to brief cases
* demonstrate correct use of legal citation
* draft legal documents using correct terminology, English grammar, and rules of
writing
* compose in a clear and concise legal memorandum and other research docu-
ments
Prerequisite(s): ENGL1302
(4 C: 3 lect/pres, 1 lab)

EGL 1204 - Administrative Legal Transcription
Students will use computers to digitally transcribe and prepare legal correspon-
dence and legal documents from digitized dictation; they will also use tape
analyze and discuss the fundamental principles underlying the marital
analyze and interpret the domestic relations statutes and case law in Minnesota
handles domestic relations cases
Course Outcomes:
* demonstrate job entry-level skills to accurately transcribe and format docu-
ments routinely prepared in a law office
* spell and define legal terminology and use correctly in legal documents
* apply rules of legal citations in legal documents
* apply rules of grammar, punctuation, and spelling to produce mailable docu-
ments from transcription
* proofread legal documents for content, spelling, punctuation, and format and
revise documents in as short a time as possible
* follow dictation instructions
* develop accuracy and speed during legal transcription
* apply basic legal transcription guidelines
* compile a portfolio of transcribed documents suitable for presentation to a
prospective employer and used as a legal document template resource book
Prerequisite(s): ADMI1204
(3 C: 2 lect/pres, 1 lab)

**LEGL 1205 - Administrative Legal Office Procedures**
This course is an overview of law office procedures including docket control,
ticker files, records management, billing, law office management fundamentals,
communication skills, filing, and machine transcription. Ethical considerations
in the law office and an introduction to the preparation of legal documents are
emphasized.
Course Outcomes:
* describe the general organization of a legal office as well as the rules and func-
tions of the law office personnel
* explain the objectives and process of law office management, including inter-
view and evaluation, compensation, and management skills
* define features of timekeeping, billing, financial management and client funds
trust accounts
* examine the importance of ethical and moral decisions and the implications and
consequences of these decisions as it relates to everyone who works in the legal
field
* demonstrate an understanding of the many administrative functions performed
by the legal administrative assistant/paralegal in the legal office such as telephone
techniques and etiquette, processing, notating and logging incoming and outgoing
mail, time and billing, and docket control
* apply the twelve basic filing rules and procedures by filing cards and miniature
correspondence containing names of individuals, businesses, and organization
* apply formatting and punctuation rules for preparing correspondence, court
papers and legal documents
* transcribe court documents and correspondence
* introduce students to various forms of management systems within law offices,
including personnel communications and attorney/paralegal/legal administrative
assistant relationships
(4 C: 4 lect/pres, 0 lab)

**LEGL 2204 - Family Law**
The purpose of the family law course is to give legal assistants a better under-
standing of domestic relations law and show students how those laws governing
family situations are applied. The content of the course includes formation of
the marital relationship, dissolution, child custody and support, adoption, abortion,
paternity, domestic violence, child neglect, and surrogacy.
Course Outcomes:
* define the skills necessary to become an effective paralegal in an office that
handles domestic relations cases
* analyze and interpret the domestic relations statutes and case law in Minnesota
* analyze and discuss the fundamental principles underlying the marital
relationship
* define the parent/child relationship, and the law of child custody
* define child support calculations and evaluate the rules and regulations regard-
ing child support and child care
* demonstrate powers of reasoning and problem solving
* examine and practice client interviewing skills to gather information
* list the procedural steps involved in a domestic relations case
* identify the court and social systems that administer the state’s statutes concern-
ing the family
* employ research and writing skills to create domestic relations documents
* examine, explain and discuss how paralegals fit into the family law practice
* analyze and discriminate how to be sensitive to the client’s distress when she/he
seeks legal help for a family problem
Prerequisite(s): LEGL1201,LEGL1202, ENGL1302
(3 C: 3 lect/pres, 0 lab)

**LEGL 2205 - Wills, Trust and Estate Planning**
This course will introduce students to the concepts, forms and procedures
necessary for estate planning and drafting of wills and trusts, and the process of
conducting an informal probate of a will. Topics studied will include analysis of
relevant statutes; examination of the components of wills and trusts; probate of
wills; durable powers of attorney; intrafamily gifts; charitable transfers; living
wills; and health care proxies.
Course Outcomes:
* demonstrate an understanding of basic substantive law of wills, trusts and
estates
* identify, define, and apply the terminology associated with wills, trusts, and
estate planning
* demonstrate an understanding of the rules of transfer of property upon death
and the rules of transfer of property by intestate statutes and by will provision
* demonstrate an understanding of the nature and function of wills and trusts and
the purpose and overall process of estate administration
* construct a simple will and a simple trust
* compare and contrast formal and informal probate of wills and prepare an
informal probate
* demonstrate an understanding of the uses and procedures for durable powers of
attorney, intrafamily gifts, charitable transfers, living wills and health care proxies
* apply document drafting skills using correct terminology, English grammar, and
rules of writing
* identify, understand, and explain the ethical employment responsibilities of
practicing legal assistants in the field of wills, trusts, and estate administration
Prerequisite(s): ENGL1302
(3 C: 3 lect/pres, 0 lab)

**LEGL 2206 - Real Estate**
This course is an introduction to real estate law. Topics of study include property
rights, principles of land ownership, sale, contracts, liens, mortgage financing,
mortgages or deeds of trust, deeds, recording, settlement concepts, condominiums
and cooperatives, leasing and other property concepts. The student will be famil-
iar with the processing of a real estate transaction from beginning through closing
and post closing procedures.
Course Outcomes:
* demonstrate an understanding of basic substantive and procedural laws that
govern real estate law
* identify, define and apply the terminology associated with real estate law
* distinguish and explain the four types of concurrent ownership; the difference
between individual and community property, private encumbrances, and uses of
an easement
* explain the requirements of a valid real estate contract and the remedies for
default under a real estate contract and prepare a real estate contract for the sale
and purchase of a home and commercial real property
* identify type of deeds used in modern real estate practice; explain the basic
requirements of a valid deed and prepare a deed
* understand the basic provisions contained in a promissory note and a guaranty
and prepare a promissory note and a guaranty
* understand and review a title examination report; identify title problems that are
not insured by a title insurance policy, and prepare a title insurance commitment

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* prepare a closing checklist for the purchaser and the seller
* understand the legal procedures required for the closing of a sale of real property
* understand the condominium, cooperative, and time-sharing forms of property ownership, and the related legal documents
* read and understand three types of land descriptions and prepare a legal description from a land survey
* identify key provisions of a commercial lease
* define the various methods to compute rent under a commercial lease
* identify, understand and explain the ethical employment responsibilities of practicing legal assistants in the field of real estate law
Prerequisite(s): ENGL1302
(3 C: 3 lect/pres, 0 lab)

LEGL 2207 - Litigation
This course will provide a comprehensive working knowledge and understanding of the principles of civil litigation in federal and state courts. Topics studied will include cases of action and defenses, introduction to rules of procedure and discovery, and ethical responsibilities. Pretrial practice, including discovery, pretrial motions, and trial preparations will be covered, together with the basics of a civil trial, post-trial motions, appeal and alternative dispute resolution. Electronic discovery and e-filing will also be studied. The principles learned will be applied to practical case studies.
Course Outcomes:
* describe, access and discuss the role of the paralegal on the litigation team, in court, and during the stages in the civil litigation process
* use substantive and procedural law in the litigation context
* recognize, identify, and locate both the federal and state rules of evidence and civil procedure and develop an understanding of the importance and application of those rules
* create forms, checklists, pleadings, documents, motions and other materials relevant to the litigation process
* recognize, identify, and demonstrate the procedures involved in interviewing clients and witnesses, filing court documents, assisting in discovery, serving papers, and assisting at trial and other litigation processes
* complete the electronic discovery process and electronic filing tutorial
* define, compare and contrast alternative dispute resolution methods
* identify, define, and apply the terminology associated with litigation
* apply document drafting skills using correct terminology, English grammar, and rules of writing
* examine the ethical and professional responsibilities of the lawyer and the paralegal in civil litigation
Prerequisite(s): ENGL1302
(3 C: 3 lect/pres, 0 lab)

LEGL 2208 - Corporate Law
This course will cover the formation, operation, and dissolution of various kinds of business corporations including: sole proprietorships, corporations, partnerships, the law of agency and employment agreements. Minnesota corporations will specifically be examined. This course will also include in-depth analysis of contract law, including common law and Uniform Commercial Code; elements of a contract; performance; status of frauds; and contract interpretation. Students will learn the fundamental principles of law and how to prepare documents necessary to each topic. In addition, this course examines the ethical considerations relating to business and contract law practice.
Course Outcomes:
* demonstrate an understanding of the law pertaining to business organizations
* locate, evaluate and apply relevant sources of law to the formation of business organizations
* understand and evaluate the business application of the basic principles of business formation, including sole proprietorships, partnerships, general, limited and professional partnerships and corporations
* research and analyze statutory requirements for drafting partnership agreements, filing fictitious name certificates and the relevant steps for incorporation
* demonstrate knowledge of those elements necessary to contract formation
* understand problems encountered in contract performance, including discharge of performance and resulting damages and remedies for breach of contract
* demonstrate the ability to apply Uniform Commercial Code provisions to contract formations and disputes
* examine Minnesota business law and procedures relating to formation of business organizations
* demonstrate the ability to draft contract provisions
* apply document drafting skills using correct terminology, English grammar, and rules of writing
* identify, understand and explain the ethical employment responsibilities of practicing legal assistants in the fields of business organizations and contract law
* examine the ethical and professional responsibilities of the lawyer and the paralegal in civil litigation
Prerequisite(s): ENGL1302
(3 C: 3 lect/pres, 0 lab)

LEGL 2209 - Paralegal Internship
This is a cooperative work-study program that will be available to students who have demonstrated readiness and willingness to work in an on-the-job situation. The experience will be a training culmination and an opportunity to apply the skills learned from their coursework. The student will work under the supervision of an attorney or experienced paralegal in day-to-day, on-site office work. The student's internship hours will vary at the internship site, which may be a private or public law office, corporate or government legal department, or other appropriate law-related setting.
Course Outcomes:
* gain hands-on experience in a law office or other appropriate law-related work environment
* apply and expand skills learned in course work in the work environment
* apply ethical and professional work standards and values relating to client confidentiality, conflicts of interest, and the unauthorized practice of law
* demonstrate continuous improvement of professional-level skills in legal-related matters, including oral and written communications, terminology, English grammar, and rules of writing
* recognize, identify, and locate both the federal and state rules of evidence and their internal systems
* formulate a firm understanding of law-related office organizations and their internal systems
* apply problem-solving and decision-making skills to work-related tasks and assignments
* obtain a professional reference and recommendation for future employment
* complete all required documentation, evaluations and reports related to the internship experience
( C: 0 lect/pres, 0 lab)

LSCE 1502 - Surveying Principles I
The student 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, positioning of corners per Public Land Survey System. Students will study historical development, description and land boundary elements related to platting, which includes, deed interpretation and boundary systems.
Course Outcomes:
* locate and calculate positions of government and property corners according to Federal, State, and local established guidelines
* perform outside traverse and topographical surveys with Total Stations
* analyze and compute traverse adjustments and section breakdowns
* identify and examine the PLSS system, convergence and error propagation
* identify coordinate geometry functions and public land survey terms
* identify and interpret boundary rights
Prerequisite(s): LSCE1526
(3 C: 1 lect/pres, 2 lab)

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 and property line surveying and precise leveling. This course includes practical field applications including total station and data collector and data transfer.

Course Outcomes:
* perform basic and complicated field surveys
* perform, understand and analyze precise level loops and traverses
* perform topographical surveys with total stations and data collectors
* transferring 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 work with others in a group situation
* demonstrate effective writing and communication skills

Prerequisite(s): LSCE1530, LSCE1502 or concurrent registration

(5 C: 1 lect/pres, 4 lab)

LSCE 1510 - Civil Drafting Methods
This course is designed to develop the student’s technical skills in map making and construction document drafting. Also to give an introduction to interpreting legal descriptions and exposure to the coordinate system, and basic concepts of the public land surveying system. Students will study and practice survey and civil engineering drafting techniques. Drafting work includes horizontal and vertical alignments with horizontal and vertical curves. Course will focus on hand drafting methods.

Course Outcomes:
* understand and select proper hand drafting methods
* produce hand drawn and hand lettered drawings
* design and produce contour, profile and cross section drawings
* analyze and calculate slope, volume, topographical data, grading, magnetic declination and angles
* recognize and understand survey and construction terms associated with cross sections, profiles, grades and coordinates
* knowledge of PLS system and horizontal curves
* exhibit safe work habits, safe equipment handling and proper interpersonal skills
* select correct drafting tools and use scaling devices accurately

(3: 1 lect/pres, 2 lab)

LSCE 1514 - Civil CADD I
Students will develop a knowledge of system configuration, hardware operations and interactive graphics software (“AutoCAD” and “Softdesk”). The student will input drafting commands to develop civil/survey drawings, store data and produce digital drawings.

Course Outcomes:
* use fundamental CADD drafting methods to create drawings
* use fundamental CADD editing techniques to edit and modify drawings so they are neat and will accurately convey ideas
* work cooperatively with others
* perform dimensioning, hatching and plotting functions on a drawing file
* download survey field data collector files into a CADD drawing

Prerequisite(s): LSCE1510

(3 C: 1 lect/pres, 2 lab)

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. The student will be introduced to materials testing. Students will study construction materials, construction methods, inspection and quality control. The students will study standard contracts and specification documents.

Course Outcomes:
* identify construction and material terms
* read and interpret plans and specifications
* perform materials testing procedures

* evaluate and analyze testing procedures through written reports
* identify and recognize construction procedures as related to civil engineering and land surveying
* estimate cost and materials for civil engineering projects
* recognize 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)

LSCE 1522 - Technical Computations I
Students will study percents, signed numbers, algebraic operation, equation manipulation, ratios, geometric principles, trigonometric functions, area and volume calculations and physics concepts.

Course Outcomes:
* computing civil engineering problems concerning areas, volumes, and vectors
* apply trigonometric functions and geometric principles to civil engineering and land surveying procedures
* understand and perform equation manipulation
* apply formulas and mathematical procedures to land surveying and engineering problems beyond basic fundamental mathematics

Prerequisite(s): MATH0380 or Appropriate Accuplacer Score.

(3 C: 1 lect/pres, 2 lab)

LSCE 1526 - Technical Computations II
Students will study the laws that govern the relationship between work, force, motion, energy and power. Students will apply this knowledge through practical lab experiments and problem solving. Students will perform the basic computations in the civil engineering/land surveying field. These include: volumes, bearings/azimuths, latitudes/departures, area traverse and various curve calculations. The student will also study elementary concepts involving coordinate geometry and route-survey methods.

Course Outcomes:
* identify and calculate physics problems involving force, equilibrium, accelerated motion
* perform related horizontal and vertical curve calculations to civil engineering and land surveying
* perform related traverse adjustments and calculations to civil engineering and land surveying practices

Prerequisite(s): MATH1300, LSCE1510 or LSCE1510, TECH1500 or LSCE1510, LSCE1522

(4 C: 3 lect/pres, 1 lab)

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.

Course 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)

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, advanced traversing, triangulation, resection, areas, volumes, section breakdown and subdivision surveys. Field projects will use total station and data collections procedures.

Course Outcomes:

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* demonstrate ability to perform ALTA surveys
* overview of ALTA survey requirements and calculations
* perform star shot procedures and calculations
* work in collaborative groups with acceptable communication skills
* perform calculations and problem solving in traverses, vertical curves and horizontal curves
* perform section breakdown in a lab situation in a collaborative group setting
* recognize and understand PLSS and GPS terms
Prerequisite(s): LSCE1506, LSCE2514
(5 C: 1 lect/pres, 4 lab)

**LSCE 2506 - Construction Design and Surveying Principles**

Students will focus on construction survey techniques and systems used in construction projects. The student will use practical field techniques for staking profile, blue tops, slope and grade staking, sanitary and storm, curb and gutter, water mains, buildings and some aspects of platting. Emphasis will be on both Total Station with data collection and traditional methods.

Course Outcomes:
* perform 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
* perform field survey of existing subdivision lots and boundary
* interpret results of the survey
* cooperate in a work group environment

Prerequisite(s): LSCE2502, LSCE2522
(5 C: 1 lect/pres, 4 lab)

**LSCE 2510 - Surveying Principles II**

Students will study Minnesota State Statutes, county and city ordinances relating to platting and surveying methods, along with techniques for record research. Emphasis will also be on writing of land descriptions and easements. Students will study professional duties of surveyor and civil engineer responsibilities and liabilities, tracing land boundaries, boundary establishment through riparian rights, deed descriptions, plats, survey evidence, metes and bounds and Public Land Survey System.

Course Outcomes:
* write, read and interpret land descriptions
* identify client-consultant-agency-contractor expectations and requirements
* study historical context and mechanics of Public Land Survey Systems (PLSS)
* examine professional practices and ethics relating to Civil Engineering and Land Surveying
* examine the evolution of property rights and practices relating to Civil Engineering and Land Surveying
* identify research methods used in property retracement

Prerequisite(s): LSCE2526
(3 C: 1 lect/pres, 2 lab)

**LSCE 2514 - Civil CADD II**

Students will focus on interactive Computer Aided Drafting and Design software 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.

Course Outcomes:
* draw, dimension and detail survey plat maps using coordinate geometry
* download field survey data using description keys and various automated mapping tools
* create triangulated irregular network (TIN) models
* produce detailed topographic maps
* produce American Land Title Association (ALTA) maps
* design roadway alignments and profiles
* produce erosion control plans

Prerequisite(s): LSCE1502, LSCE1514, LSCE1526
(3 C: 1 lect/pres, 2 lab)

**LSCE 2518 - Utility Design I**

Students will study basic fluid mechanics. Focus will be on fluid flow characteristics of gravity sanitary sewer and storm sewer systems. Students will be introduced to storm water hydrology, storm water management, and various wetland issues. Students will design storm sewer systems including piping, inlet structures, storm water facilities and site grading and will prepare plan and profile drawings.

Course Outcomes:
* produce a drainage report for a housing subdivision project
* study field and office survey methods for determining watershed limits
* use the Rational method to estimate watershed runoff
* calculate pipe flow and open channel flow geometry and flow quantities
* use the Continuity Equation and Manning’s equation to analyze flows through hand calculations and by using computer programs
* design storm water collection system and produce grading plans, plan and profile drawings and related appurtenances
* study current NPDES requirements and produce erosion control documents
* read and interpret construction specifications

Prerequisite(s): LSCE1506
(3 C: 1 lect/pres, 2 lab)

**LSCE 2522 - Civil CADD III**

Students will study civil engineering and land surveying design tasks using advanced Autodesk engineering and surveying software. Topics include advanced principles of coordinate geometry, digital terrain modeling, roadway plan and profile, cross sections and earthwork design.

Course Outcomes:
* use grading design functions to create grading plans and earthwork functions to compute earthwork volumes
* perform traverse adjustment calculations using compass rule and least squares methods. These will be done by both hand and computer methods
* design urban street-plan and profile construction drawings
* design rural road-plan and profile construction drawings
* upload survey data to data collectors for field use
* produce personal resume and cover letter

Prerequisite(s): LSCE2514
(3 C: 1 lect/pres, 2 lab)

**LSCE 2526 - Subdivision Design**

Students will focus on subdivision design. Topics include plat layout, grading and earthwork, hydrology, and storm water management. The student will also study wetland issues, existing land use factors, and zoning considerations. Minnesota State Statutes, county and city ordinances relating to platting, along with techniques for record research will also be discussed.

Course Outcomes:
* identify subdivision design constraints found in the State Statutes and in various County, City and local ordinances
* use design constraints to produce sketch plats
* design a preliminary and final plat
* design horizontal and vertical alignment of roadways. This will include vertical curves, horizontal curves and other geometric elements of roadway design
* produce grading plans and roadway construction documents
* read and interpret construction specifications

Corequisite(s): LSCE2514
Prerequisite(s): LSCE1502
(4 C: 3 lect/pres, 1 lab)

**LSCE 2530 - Utility Design II**

Students will study basic fluid mechanics and flows in both gravity and pressure systems. Focus will be on flow characteristics in sanitary sewer systems and water supply systems. Students will design a water distribution system and become familiar with materials, valves, flow control devices, appurtenances and construction.

Course Outcomes:
* create a preliminary design report for a sewer and water construction project in a housing subdivision
* devise a basic sewer collection system for a housing subdivision. Includes the

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**PLEASE NOTE:** All program plans are preliminary and curriculum may change without notice.
selection of appropriate materials, slopes, quantities, capacities and system sizing
* devise a basic water distribution system for a housing subdivision. Includes the selection of appropriate materials, slopes, quantities, capacities and system sizing
* develop construction drawings for utility construction project
* read and draw conclusions from construction specifications
Corequisite(s): LSCE2522
Prerequisite(s): LSCE2518, LSCE2526
(3 C: 1 lect/pres, 2 lab)

MACH 1500 - Machine Tool Technology I - Modified Course for Tech Prep
This course will cover first level instruction in the setup and operation of common machine tools as well as the use of hand and precision tools. Machining of projects will begin with basic cutoff saw, lathe, milling machine and drill press setup and operation. Complimentary skills will be demonstrated in off-hand grinding and bench work operations.
Course Outcomes:
* complete milling projects on vertical mill
* complete various lathe projects on the engine lathe
* complete bench projects utilizing hand tools
* understand the importance of proper machine setup
* proficiency using bandsaws to complete machining projects
* complete drilling projects on metal working 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
( C: 0 lect/pres, 0 lab)

MACH 1503 - Machine 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.
Course Outcomes:
* completion of milling projects on vertical mill
* completion of various lathe projects on the engine lathe
* 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: 0 lect/pres, 4 lab)

MACH 1505 - Machine Tool Technology II - Modified Course for Tech Prep
This course is part of a Tech Prep articulation agreement. The students participating will be required to attend this class the full semester. This course will cover the operations of a drill press, pedestal grinder, milling machines, lathe, vertical, horizontal band saw and bench tools. Machine safety and machine component identification are also a part of the components listed above. The student will perform part layout, as well as milling, taper turning, boring, threading, drilling and proper hand tool use. The student will also learn the care and use of inspection and layout tools.
Course Outcomes:
* completion of milling and boring, parallel and step milling projects utilizing milling machine
* completion of facing, turning, external threading, taper turning projects utilizing engine lathe
* completion of precision layout using height gage
* develop and apply safe work habits around all metalworking equipment and co-workers
( 5 C: 0 lect/pres, 5 lab)

MACH 1510 - Machine 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 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.
Course 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: 0 lect/pres, 4 lab)

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 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.
Course Outcomes:
* develop projects requiring indexing, keyway cutting, radius, boring, pocket and slot milling utilizing a milling machine
* create projects on the engine lathe that will produce tapes, 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 metal working equipment and co-workers
Prerequisite(s): MACH1510, MACH1517
(5 C: 0 lect/pres, 5 lab)

MACH 1514 - Introduction to Swiss Machining
This course is an introduction course to Swiss machining and programming. Upon completion of this course the student will become familiar with Swiss turning machine equipment, components, features, tooling, set-up and programming. Students will also work on advanced projects on manual equipment when assigned. Several units of advanced inspection procedures and equipment will be part of this course.
Course 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

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* 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): MACH1517, MACH1510
(2 C: 0 lect/pres, 2 lab)

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.
Course Outcomes:
* interpret different lines
* understand view arrangements
* proficiency in reading blueprints
* interpret dimensioning
* interpret surface texture callout
* interpret classification of fits
Corequisite(s): MACH1503, MACH1510
(1 C: 0 lect/pres, 1 lab)

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.
Course 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)

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 and keeping information will also be provided for students.
Course Outcomes:
* understand ANSI 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 GD&T symbols and controls
* complete on a sketch pertinent feature control frames on a part’s features(s) to symbolize exact GD&T 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 GD&T symbology
* job seeking and keeping requirements
(1 C: 0 lect/pres, 1 lab)

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.
Course 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)

MACH 1530 - CNC Fundamentals
This course is intended to give the student an introduction into the computer numerical control segment of machine tool technology. The student’s time will be spent learning the fundamentals of CNC machine, programming aspects, coordinate systems, word address system, computer download routines and basic setups.
Course Outcomes:
* demonstrate safety habits consistent with industry standards and college policy
* demonstrate the ability to manipulate cnc machines to turn them on and to perform startup procedures
* learn dimensioning systems required for programming parts from blueprint dimensions
* demonstrate the ability to work with others
* demonstrate the ability to use a computer to send and receive programs to cnc machine
* explain the code necessary for simple CNC programs
* recognize critical components of cnc machines and their function
(2 C: 1 lect/pres, 1 lab)

MACH 2502 - Introduction to CNC Turning
This is a basic programming and CNC lathe operation course. The student will learn the basics of the word address system as applied to CNC turning centers. Programs will be written manually and with computer-assist (CAM) and proved out using simulation software prior to running on the CNC turning center. Students will machine their own parts and inspect for dimensional accuracy using appropriate precision tools.
(3 C: 1 lect/pres, 2 lab)

MACH 2506 - Introduction to CNC Milling
Basic programming and milling course. Students will learn the CNC word address programming language. The primary activities of this course are to program, setup and operate a CNC milling machine. Programming will involve drilling and milling operations, using manual and computer-assist (CAM) methods. Students will input programs using manual data input or download through a personal computer. Programs will be input, saved and simulated on a personal computer prior to downloading into the CNC mill.
Course Outcomes:
* understand a CNC milling machine and its control
* proficiency in CNC word address language and its proper format in writing a CNC program
* experience in proper setup of CNC milling machine to perform milling and drilling programs
* utilize CNC programming software to write basic milling and drilling programs and to simulate the same

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* proficiency in writing CNC program documentation via setup sheets

(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, cermet, diamond and cubic boron carbide type cutting inserts will be examined as to their use in machining and manufacturing.

Course 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, 2 lab)

(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.

Course Outcomes:
* understand steel types and their application in the metalworking industry
* proficiency in using correct tests to determine tensile strength and hardness of materials and metals
* 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)

(MACH 2518 - Advanced CNC Milling)
This course will emphasize the setup and operation of (CNC) machining centers to produce multiple and/or complex machined piece-parts. The programs will be written both manually and computer-assist and simulated on the computer prior to running on the machine. Program entry will be performed through downloading from the computer.

Course Outcomes:
* understand machining center setup and modes of operation
* proficiency in CNC machining centers to write programs and operate the machine to execute these programs
* experience in proper setup of CNC machining centers to select the proper tooling and maintain it during the run of the piece-parts
* utilize computer-assist programming software to describe geometry, generate tool path and post-process data for machining center programs
* utilize programming software to write and edit engraving program to run on a machining center

Prerequisite(s): MACH2506

(3 C: 1 lect/pres, 2 lab)

(MACH 2523 - High Performance Manufacturing)
This course is designed to help students understand the practical use of basic quality management as well as production tools and procedures. Students will be engaged in the use of various statistical process control charting and exercises which stress quality in the workplace. Corrective and preventive action techniques will be used in assessing non-conforming product. Information on the control and documentation of production will be stressed.

Course Outcomes:
* understand quality concepts and tools of quality as used in typical metalworking industries
* proficiency in using correct statistical charts to measure processes and establishing process capability
* experience in determining process capability and control values using statistical formulæ
* utilize the pocket calculator to determine statistical values for given data
* understand the components of producing a product to customer requirements
* experience in small group problem-solving techniques to find causes of variation and determine best methods of solving these problems
* identify the steps involved in building quality into the product
* experience the importance of data collection and analysis to qualify a process
* identify when to use preventive action and when to use corrective action

(1 C: 0 lect/pres, 1 lab)

(MACH 2526 - Advanced CNC Turning)
This course will emphasize the setup and operation of a (CNC) slant bed turning center with a Fanuc control. Students will be required to perform setups and program complex shaped piece-parts using internal and external tools. The programs will be written both manually and computer-assist (CAM) and simulated on the computer prior to running on the machine. Program entry will be performed through downloading from the computer.

Course Outcomes:
* understand various tooling designed for turning center application
* proficiency in CNC turning center setup and operation to generate programs which include internal and external features
* experience in proper setup of CNC turning center to produce complete piece-parts
* utilize computer-assist programming software to describe geometry, generate tool path and post-process data for CNC turning center
* utilize control screens efficiently to control machine operation
* proficiency in the setup of the tooling for turning center operation of single piece-part or production quantities of piece-parts

Prerequisite(s): MACH2502

(3 C: 1 lect/pres, 2 lab)

(MACH 2528 - Electrical Discharge Machining)
This course is intended to give the student an opportunity to learn the area of electrical discharge machining. Students will setup, operate and program these machines to produce parts to blueprint requirements.

Course Outcomes:
* demonstrate safety habits consistent with industry standards and college policy
* demonstrate the ability to setup and operate CNC EDM and manual EDM machines
* demonstrate the ability to setup and operate EDM manual sinker machines
* demonstrate the ability to program CNC wire-feed 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: 0 lect/pres, 2 lab)

(MACH 2530 - 3D Milling)
This course will emphasize the setup and operation of computerized (CNC) machining centers to produce three-dimensional shaped piece-parts. The projects will be programmed using manual and computer-assist techniques. Three-dimensional programs using sub-programming will also be addressed. The machining in three axes will be performed on metal parts and mold shapes.

Course Outcomes:
* understand various methods to produce three-dimensional shapes
* demonstrate proficiency on CNC machining centers to generate programs in the X, Y and Z axis simultaneously
* perform setup of CNC machining centers to allow for three-dimensional machining

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* utilize computer-assist programming software to describe geometry, generate tool path and post-process data for CNC program
* utilize programming software to write and edit engraving program to mill on a contoured surface
Prerequisite(s): MACH2506, MACH2518 or may be taken in conjunction with this course
(2 C: 0 lect/pres, 2 lab)

MACH 2533 - 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.
Course Outcomes:
* demonstrate the ability to program using CAM software and two and four axis programs
* demonstrate the ability to setup and operate EDM manual sinker machines
* demonstrate the ability to 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
(2 C: 0 lect/pres, 2 lab)

MACH 2537 - Swiss CNC Turning Advanced
This course is intended to give the student an in-depth experience in Swiss CNC turning. The student’s time will be spent learning the programming software and advanced programming language necessary to complete multi-axis and multi-operations on the machine. 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.
Course 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 gantry 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
Prerequisite(s): MACH1514
(3 C: 0 lect/pres, 3 lab)

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.
Course 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
Prerequisite(s): MACH2518, MACH2526
(1 C: 0 lect/pres, 1 lab)

MATH 0380 - Basic Math Skills
This course is designed to help students upgrade their skills in addition, subtraction, multiplication and division of whole numbers, decimal numbers and fractions as well as ratios and proportions, percents, basic geometric formulas and the metric system. Students will also acquire skills in pre-algebra; signed numbers, powers, and solving simple equations. This course will emphasize solving and applications of these skills.
Course Outcomes:
* demonstrate the use of arithmetic operations to solve problems containing whole numbers, fractions, decimals, ratios, proportions and percents
* select and apply appropriate basic geometric formulas to calculate area, volume, perimeter and circumference
* demonstrate an understanding of the relationship between whole numbers, fractions, decimals, ratios, proportions and percents
* demonstrate an understanding of units of measurement and convert between various English and metric units
* apply appropriate algebraic principles to evaluate expressions and solve basic linear equations
(3 C: 3 lect/pres, 0 lab)

MATH 0470 - Elementary Algebra
This course is an introductory course in the principles and applications of algebra. Topics covered include solving equations and inequalities, application of percents, graphs of equations, data analysis, graphing linear equations, exponents and scientific notations, operations on polynomials, factoring polynomials, solving quadratic equations be factoring, and rational expressions. A wide variety of examples and exercises are used to help the student connect the mathematical content with the real world.
Course Outcomes:
* apply the laws of real numbers and order of operations to simplify algebraic expressions
* solve linear equations and inequalities in one variable
* convert verbal expressions to algebraic form
* solve applied problems involving percents
* interpret circle, bar, and line graphs
* plot points and lines from tables of values and x and y intercepts
* apply the rules for exponents and solve problems using scientific notation
* add, subtract, multiply and divide factor polynomials
* solve quadratic equations using factoring and the principle of zero products
* multiply, divide, subtract and simplify rational expressions
* demonstrate and apply critical thinking skills to solve a variety of problems
* utilize a systematic approach to problem solving
* 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
* 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): MATH0380 or Appropriate Accuplacer Score.
(3 C: 2 lect/pres, 1 lab)

MATH 0480 - Intermediate Algebra
This course is an intermediate course in the principles and applications of algebra. Topics covered include division and factoring polynomials, rational equations, functions, systems of equations, radical expressions and equations, quadratic 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.
Course Outcomes:
* factor Polynomials including difference of squares, and sum and difference of cubes
* divide polynomials using a synthetic division

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
MATH 1300 - College Algebra
Meet 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.

Course 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): MATH1330 or MATH0480 or LSCE1522 or MATH0490 or TECH1500 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

MATH 1320 - College Trigonometry
Meet MN Transfer Goal 4 - Mathematical/Logical Reasoning. This course covers topics typically addressed in a college trigonometry course. The course is designed for students who have good algebra skills 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.

Course 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 as a member of a team to achieve a common goal, by showing respect for other peoples 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): TECH1500 or MATH1300 or LSCE1522
(3 C: 2 lect/pres, 1 lab)

MATH 1330 - Cultural Mathematics
Meet MN Transfer Goal 4 - Mathematical/Logical Reasoning. This course is an investigation into the nature of mathematics and the application of mathematics to varied disciplines including the arts and sciences across cultures. Students will experience mathematics as a creative and evolving discipline. Topics include set theory, logic, graph theory (networks), numeration systems, number theory and the real number system, algebraic models, linear equations, linear inequalities, geometry, consumer mathematics, counting, probability and statistics. Emphasis will be placed on applications in these topic areas.

Course Outcomes:
* solve practical problems using all mathematical principles/topics presented
* demonstrate and apply critical thinking skills to solve a variety of problems
* utilize a systematic approach to problem solving
* demonstrate the ability to work as a member of a team to achieve a common goal, by showing respect for other peoples needs, ideas and feelings
* use appropriate computer technology and software to perform analysis and calculations
* model professional and responsible behavior by being on time, participating in class discussions and completing assignments on time

Prerequisite(s): MATH1330 or MATH0480 or LSCE1522
(2 C: 2 lect/pres, 0 lab)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* demonstrate effective use of resources including faculty, other students, reference materials, industry sources, and the Internet
* demonstrate an awareness of the application of mathematics to global and social issues

Prerequisite(s): MATH0480 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

MATH 1350 - Introduction to Statistics
Meets MN Transfer Goal 4 - Mathematical/Logical Reasoning.
This course is an introduction to the principles and applications of statistics that emphasizes working with data and statistical ideas. The primary goals of this course are to help individuals acquire a solid foundation in the basic principles of statistics and to show how statistics can be used to analyze and solve authentic real-world problems. This course uses data and examples from many disciplines and is applicable to any major. Topics include descriptive measures of empirical data, graphs and distributions, sampling and experiment design, probability and probability distributions, estimation, hypothesis testing, inference, correlation, and regression.
Course Outcomes:
* apply the basic mathematical concepts that form the foundation of statistical analysis
* utilize procedures for manipulating algebraic expressions and equations
* demonstrate and apply critical thinking skills to solve a variety of problems
* 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): MATH1300 or MATH0480 or MATH0490 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

MHTT 1502 - Diesel Engine I
In this introductory course, students learn theory design to operation of a diesel engine and fuel system. Working in the lab in groups of two, students will disassemble, inspect and reassemble a running light duty diesel engine. After completion of this course students will be prepared to advance to Diesel II.
Course Outcomes:
* Identify and demonstrate safe use of hand tools and shop equipment
* Identify and explain functions of parts of an engine
* Disassemble engine and clean parts
* Use OEM manual to inspect and measure engine parts
* Assemble engine using manual techniques and specifications
* Test and adjust fuel system
* Test run engine for operating conditions

(4 C: 2 lect/pres, 2 lab)

MHTT 1506 - Mobile Hydraulics
In addition to power steering, the application of hydraulics on trucks is widespread, such as on sanitation, snowplows, agriculture, and construction trucks. In this course students study the design and operation of pumps, valves, cylinders, motors, and other hydraulic components on these trucks. The student will service, test, and repair hydraulic systems used on trucks.
Course Outcomes:
* Demonstrate knowledge of hydraulic fundamentals
* Identify various hydraulic components and their parts
* Demonstrate knowledge of operation of hydraulic components
* Disassemble and inspect hydraulic components
* Perform maintenance on a hydraulic system
* Diagnose and test a hydraulic system

(2 C: 1 lect/pres, 1 lab)

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 operation, retrieve and program data, in accordance with manufacturer’s procedures.
Course Outcomes:
* Identify, describe, and test input devices
* Identify and operate different types of scan tools
* Become familiarized with different software used in scan tools and laptops
* Retrieve data and perform basic programming of the ECM
* Identify, describe, and test output devices
* Locate and retrieve and use service, technical, and troubleshooting information
* Exhibit technician/mechanic professionalism

Prerequisite(s): TRAN1504
(2 C: 1 lect/pres, 1 lab)

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, drive lines and differentials. Other studies include component troubleshooting, repair operations, and preventive maintenance practices.
Course Outcomes:
* Understand clutch, manual transmission, drive shaft and differential theory of operation
* Utilize manufacturer’s service data to complete power train rebuild and repair procedures
* Troubleshoot noise, vibration, and poor performance of truck power train components
* Determine power train preventive maintenance operations

(4 C: 1 lect/pres, 3 lab)

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.
Course Outcomes:
* Understand hydraulic and pneumatic brake system theory of operation
* Utilize manufacturer’s service data to complete brake system repair procedures
* Troubleshoot noisy and poor brake system performance and determine necessary repairs
* Determine brake system preventive maintenance operations

(4 C: 1 lect/pres, 3 lab)

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.
Course Outcomes:
* Identify alignment angles
* Determine repair procedures necessary to correct vehicle alignment angles
* Utilize manufacturer’s service data to complete wheel bearing and suspension system repairs
* Understand steering system theory of operation
* Utilize manufacturer’s service data to complete steering system repairs
* Determine steering and suspension system preventive maintenance operations

(3 C: 1 lect/pres, 2 lab)

MHTT 1522 - Electrical II
Through this course the electrical theory learned in Electrical I is applied to the vehicle by the study of the starting and charging systems. Upon the completion of the course students will be prepared to advance to Diesel II.

(3 C: 1 lect/pres, 2 lab)
of this course students will be able to troubleshoot and repair starting and charging systems on light, medium, and heavy trucks.

Course Outcomes:
* demonstrate knowledge of operation and testing of batteries
* demonstrate knowledge of operation and testing of starting systems
* demonstrate knowledge of operation and testing of charging systems
* servicing of battery, starting, and charging systems
Prerequisite(s): TRAN1504
(2 C: 1 lect/pres, 1 lab)

**MHTT 1526 - Truck Maintenance I**
The goal of low cost efficient truck operation is to maintain the trucks in a manner that minimized repair and downtime and ensures safe vehicle operations for the driver. This goal is the emphasis for this course. Following the recommendations of the OEM maintenance manuals, the student will perform truck maintenance in the lab.

Course Outcomes:
* understand the importance of preventive maintenance
* examine OEM maintenance schedules
* develop a preventative maintenance schedule
* perform vehicle maintenance
* examine service parts and fluids used in maintenance
* perform shop equipment maintenance
* troubleshoot vehicle electrical failures
* troubleshoot engine failures
* diagram a maintenance shop facility
(3 C: 1 lect/pres, 2 lab)

**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.

Course Outcomes:
* 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)

**MHTT 2502 - Diesel II**
With the knowledge and experience gained in Diesel I, students practice engine rebuilding skills on medium to heavy duty diesel engines in the lab. Emphasis is placed on understanding the theory and operation of different fuel systems and tune up procedures.

Course Outcomes:
* understand fuel system theory of operation of various engine manufacturers
* utilize engine manufacturer’s service data to complete repair procedures
* perform engine rebuild and repair procedures
* troubleshoot engine no-start and misfire conditions
* determine engine component condition for re-use
Prerequisite(s): MHTT1502
(4 C: 1 lect/pres, 3 lab)

**MHTT 2506 - Diesel III**
In this final course of the Diesel Engines/Fuel Systems series, students 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.

Course Outcomes:
* describe fuel system types
* describe tune-up procedures
* perform engine tune-ups
* explain engine computer operation
* read engine computer wiring diagrams
* program engine computer parameters
* troubleshoot mechanical engine failures
* troubleshoot electronic engine failures
* perform chassis dynamometer test
Prerequisite(s): MHTT2502 (4 C: 2 lect/pres, 2 lab)

**MHTT 2514 - Gasoline Engines**
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.

Course 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
(3 C: 1 lect/pres, 2 lab)

**MHTT 2518 - Automatic Transmissions**
The popularity of the transmission in the trucking industry continues to grow. This elective course gives students the opportunity to study the theory and operation in the classroom. Then, experience hands on skills in the lab by practicing the rebuilding of an operational Allison automatic transmission.

Course Outcomes:
* identify the parts of an automatic transmission
* understand the operation of automatic transmission parts
* disassemble, clean, and inspect automatic transmission
* reassemble automatic transmission
* test automatic transmission
* remove and install automatic transmission
* perform automatic transmission maintenance
(3 C: 1 lect/pres, 2 lab)

**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 performing industry approved electrical repair procedures.

Course Outcomes:
* read electrical diagrams
* use multimeters to test circuits
* test starting and charging circuits
* repair electrical failures
* remember standard color codes
* test electrical components
Prerequisite(s): MHTT1522 or AUTO1509, TRAN1516 or TRAN1516, AUTO1510
(3 C: 1 lect/pres, 2 lab)

**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.

Course 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

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Prerequisite(s): TRAN2514
(2 C: 1 lect/pres, 1 lab)

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.
Course Outcomes:
* explain refrigeration system
* 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)

MHTT 2538 - Supervised Internship
Students will work in a sponsoring Medium/Heavy truck 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 course, with credits 1-7.
Course 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)

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.
Course Outcomes:
* use manufacturer service data and troubleshooting procedures to identify, diagnose, and to perform repairs on vehicle electrical and mechanical system problems
* analyze drivers report and problem descriptions to determine proper troubleshooting procedures
* perform power analysis of engine systems, determine and complete necessary repairs to achieve peak engine performance
* utilize mechanical gauges to perform diagnostics and repairs of vehicle mechanical systems
* utilize DVOM and computerized scan equipment to perform diagnostics and repairs of vehicle systems
* develop and perform vehicle Preventive Maintenance Inspection
* identify procedures and perform MNDOT annual vehicle inspection
* perform rebuild of truck component following manufacturers rebuilding procedures
(4 C: 1 lect/pres, 3 lab)

MSNA 1200 - IT Essentials
Students learn the functionality of hardware and software components as well as suggested best practices in maintenance and safety issues. The students, through hands-on activities and labs, learn to assemble and configure a computer, install operating systems and software, and troubleshoot hardware and software problems. In addition, this course includes an introduction to networking. This course helps students prepare for the CompTIA A+ certification.
Course 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
* use 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
(3 C: 2 lect/pres, 1 lab)

MSNA 1201 - Intro to Networking
The Introduction to Networking introduces first semester students to the internationally used terminology, basic concepts and standards of computer networking. Students will, through lecture and lab, learn the basic skills needed to manage, maintain, troubleshoot, install, operate and configure basic network infrastructure, and be able to describe networking technologies, basic design principles, adhere to wiring standards, and use testing tools. Upon completion of the course, students will also understand the requirements necessary to pass the CompTIA Networking+ certification exam.
Course Outcomes:
* understand, explain and use basic network technologies
* identify standard network media and topologies
* identify and connect network device connections
* explain and apply network management models, documentation and rationale
* identify basic network Command Line Interface (CLI) utilities, other software and hardware tools
* understand, explain and employment of network security hardware and software
* calculate IP subnet addresses
* achieve 100% on the standardized course quiz, being able to precisely identify the OSI, TCP/IP models, with each model’s associated components, protocols and equipment
(2 C: 2 lect/pres, 0 lab)

MSNA 1203 - MS Windows Vista 70-620
Students will study the skills needed to effectively manage the Microsoft Windows Vista desktop operating system. Topics include installing the operating system and applications, how to use functions and utilities, manage security, and describe the importance of knowing the command line environment. This course also prepares students for the Microsoft 70-620 exam.
Course Outcomes:
* assess MS Windows Vista as a desktop operating system
* install Vista operating system
* upgrade Vista
* configure system settings
* install and configure applications
* configure operating system security
* optimize system performance
* troubleshoot operating system and application software and hardware
* understand use of Vista in mobile computers
(3 C: 2 lect/pres, 1 lab)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
MSNA 1204 - Cisco (Exploration) Fundamentals
This course provides students with the fundamental skills needed to be successful in any network-related degree program by introducing architecture, functions, components and models of networks and using OSI and TCP/IP layered models. It uses the OSI and TCP layered models to examine the nature and roles of protocols and services at the application, network, data link, and physical layers. The principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations are introduced, to provide a foundation for the curriculum.
Course Outcomes:
* explain the importance of data networks and the Internet in supporting business communications and everyday activities
* recognize the devices and services that are used to support communications across an Internetwork
* explain the layers of communication in data networks, using protocol models
* describe the importance of addressing and naming schemes at various layers of data networks
* analyze the operations and features of the OSI Transport layer protocols and services
* design, calculate and apply subnet masks and addresses to fulfill given requirements
* describe the operation of protocols at the OSI Data Link layer and explain how they support communications
* explain the role of OSI Physical Layer protocols and services in supporting communications across data networks
* employ basic cabling and network designs to connect devices in accordance with stated objectives
* build a simple Ethernet network using routers and switches
* analyze the operations and features of common OSI Application Layer protocols such as HTTP, DNS, DHCP, SMTP, Telnet, and FTP
* utilize common network utilities to verify small network operations, analyze data traffic, and troubleshoot network problems
Prerequisite(s): MSNA1201 or MATH0380 or MATH1300 or Appropriate Accuplacer Score.
(3 C: 1 lect/pres, 2 lab)

MSNA 1206 - Cisco (Exploration) Switching and Wireless
This course provides a comprehensive theoretical and practical approach to learning the technologies and protocols needed to design and implement a converged switched network. Students learn about the hierarchical network design model and how to select devices for each layer. The course explains how to configure a switch for basic functionality and how to implement Virtual LANs, VTP, and Inter-VLAN routing in a converged network. The different implementations of Spanning Tree Protocol in a converged network are presented. Students will develop the knowledge and skills necessary to implement a WLAN in a small to medium network. This course is part of the four-part Cisco curriculum that prepares for the CCNA certification exam.
Course Outcomes:
* identify and correct common network problems at the OSI model layers 1, 2, 3, and 7, using a layered model approach
* interpret network diagrams, and select the appropriate media, cables, ports, and connectors to connect switches to other network devices and hosts
* explain the technology and media access control method for Ethernet networks, as well as basic switching concepts and the operation of Cisco switches
* perform and verify initial switch configuration tasks including remote access management
* describe enhanced switching technologies such as VLANs, VLAN Trunking Protocol (VTP), Rapid Spanning Tree Protocol (RSTP), Per VLAN Spanning Tree Protocol (PVSTP), and 802.1q
* describe how VLANs create logically separate networks and how routing occurs between them
* configure, verify, and troubleshoot VLANs, trunking on Cisco switches, inter-VLAN routing, VTP, and RSTP
* interpret the output of various show and debug commands, to verify the operational status of a Cisco switched network, as well as verify network status and switch operation using basic utilities such as ping, traceroute, Telnet, Secure Shell (SSH), Address Resolution Protocol (ARP), ipconfig, show and debug commands
* identify, prescribe, and resolve common switched network media issues, configuration issues, autonegotiation, and switch hardware failures
* manage Cisco IOS software and Cisco configuration files
* describe standards associated with wireless media
* identify the purpose of the components in a small wireless network, such as Service Set Identification (SSID), Basic Service Set (BSS), and Extended Service Set (ESS)
* configure basic parameters on a wireless network to ensure that devices connect to the correct access points
* compare and contrast Wi-Fi Protected Access (WPA) security features and capabilities of open, Wired Equivalent Privacy (WEP), and WPA-1/2 networks
* describe common wireless-network implementation issues such as interference and misconfiguration
Prerequisite(s): MSNA1204
(3 C: 1 lect/pres, 2 lab)

MSNA 1208 - IT Essentials II
This course is an intensive introduction to networking fundamentals and multituser/multitasking network operating systems. Students will learn characteristics of the Linux and MS Windows network operating systems. They will explore a variety of topics including installation and configuration procedures. Students will also learn more advanced administrative tasks such as troubleshooting issues, security issues, and remote access. The curriculum is a basic introduction to the CompTIA Server+ certification topics.
Course Outcomes:
* demonstrate knowledge of Network Operating System (NOS) competencies and vocabulary
* describe network design and topology, media types and effectiveness
* configure network and Internet connectivity
* learn NOS installation and configuration
* install and troubleshoot Windows and Linux NOS
* plan and develop network security
* administer Windows and Linux user accounts, through user creation and resource security
* install and maintain hardware in existing MS Windows and Linux system

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
MSNA 1209 - MSNA Portfolio

Students will learn to use computer applications and Internet based support services to prepare both electronic and paper copies of a personal portfolio, documenting their knowledge and experience in information technology. Through individual and group work and discussions, students will produce finished paper and electronic documents, which they can use in seeking employment.

Course Outcomes:
* knowledge of tools and techniques used to create portfolios
* demonstrate ability to present technical knowledge and skills to a selected audience
* use desktop applications and eFolio web-based portfolio software to prepare portfolios
* ability to formulate and present information appropriate to a designated audience

Prerequisite(s): MSNA1200 or MSNA1201
(1 C: 1 lect/pres, 0 lab)

MSNA 1210 - Network Cabling

The Network Cabling course is designed to teach students the physical aspects of voice and data network cabling and installation. The course focuses on cabling issues related to data and voice connections. It provides an understanding of the industry and its worldwide standards, types of media and cabling, physical and logical networks, as well as signal transmission. This course stresses documentation, design, and installation issues, as well as laboratory safety, on-the-job safety, and working effectively with others. Students successfully completing this course are aware of the requirements needed to prepare for generic and vendor-specific certification tests.

Course Outcomes:
* understand cabling standards
* comprehend and follow safety issues associated with cabling
* describe signal transmission concepts through various media
* discuss networking basic concepts, describing media types and characteristics
* demonstrate proper cabling tool usage
* explain differences and similarities in international cabling standards
* demonstrate cabling skills to complete “rough in,” “trim out” and “finish” phases
* discuss cabling in special situations and conditions
* implement structured cabling
* prepare for vendor and global certifications

Prerequisite(s): MSNA1200, MSNA1202
(3 C: 2 lect/pres, 1 lab)

MSNA 1213 - MS Server 2008 - Network Infra 70-642

Students will learn the concepts and skills necessary to install and configure the Microsoft (MS) Windows 2008 Network Operating System (NOS). Topics include introduction to networking concepts, installing the MS Server 2008 NOS, configuring server components, maintaining the network and securing data transmission. This course also prepares students for the Microsoft 70-642 certification exam.

Course Outcomes:
* install MS Server 2008 NOS
* configure server settings
* understand, choose and configure server roles
* configure storage
* activate the server with Microsoft
* configure routing and remote access
* configure and maintain file and print services
* maintain the MS Server 2008 network health
* secure data transmission and authentication

Prerequisite(s): MSNA1203 or Appropriate Accuplacer Score.
(3 C: 2 lect/pres, 1 lab)

MSNA 2201 - MS Server 2008 - AD Configuration 70-640

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. This course will also prepare the student for the Microsoft 70-640 certification exam.

Course Outcomes:
* install Active Directory on MS Server
* assess Active Directory in Server Setting
* configure Active Directory in Server
* install and configure software
* configure security
* perform backups
* troubleshoot Active Directory on MS Server
* install and configure group policies
* install and configure web security

Prerequisite(s): MSNA1213
(3 C: 2 lect/pres, 1 lab)

MSNA 2203 - MS Small Business Server 2008

Microsoft Small Business Server 2008 is the combination of Microsoft Server 2008 and Network Operating System (NOS) applications, including Exchange e-mail, SharePoint portal and document management, SQL database server and ISA Internet Server. Coursework includes installation, configuration of the server, and NOS applications. This course will prepare students to maintain a Small Business Server to meet small and medium business information technology requirements.

Course Outcomes:
* identify the different components of Microsoft Small Business Server 2008
* restate business functionality of NOS applications
* compare and contrast MS Small Business Server strengths and weaknesses with other NOS
* install, configure and use Small Business Server 2008 resources and applications
* add, delete and change NOS user access and resource rights
* demonstrate Small Business Server 2008 functionality to end users
* train end users how to use NOS applications
* recognize and select appropriate NOS applications to solve business challenges
* modify NOS applications to meet specific organizational needs
* troubleshoot Small Business Server 2008 problems

Prerequisite(s): MSNA1203
(3 C: 2 lect/pres, 1 lab)

MSNA 2204 - Wireless CWNA

This lecture and lab course is designed to expose wireless concepts to the student. The student will understand how to install, configure, and troubleshoot wireless networks. Through current and book examples, the course will present real-world examples of the issues facing network administrators. Students will explore the basics of wireless networks, wireless security, network architecture, network models, risk management, network security policy, and configuration training.

Course Outcomes:
* summarize basic terminology of wireless networking
* build various types of wireless networks
* secure a wireless network
* install and integrate wireless networks with existing networks
* plan for the future growth of wireless technology with internet research
* troubleshoot wireless networks using Lan troubleshooting tools
* manage a Wireless LAN in lab setting
* define wireless LAN Devices and Standards
* prepare for taking the Certified Wireless Network Administrator (CWNA) certification exam

(2 C: 1 lect/pres, 1 lab)

MSNA 2205 - Wireless Networking

This lecture and lab course is designed to expose wireless concepts to the student. The student will understand how to install, configure, and troubleshoot wireless networks.
 networks. Through current and book examples, the course will present real-world examples of the issues facing network administrators. Students will explore the basics of wireless networks, wireless security, network architecture, network models, risk management, network security policy, and configuration training. Course Outcomes:

- define and explain the basic concepts of Radio Frequency (RF) behavior, RF mathematics and RF Signals and antenna components
- identify concepts, uses, differences and types of Spread Spectrum technologies
- identify, use and configure the 802.11 protocol architecture, including Service Sets, power management, OSI MAC and physical layer technologies, infrastructure and client devices
- design, implement and manage 802.11 networks
- troubleshoot wireless networks using LAN trouble shooting tools
- identify, configure, manage and monitor the 802.11 network security architecture
- explain importance and processes involved in network site survey fundamentals
- plan for the future growth of wireless technology with internet research
- prepare for Linux+ certification

Course Outcomes:

- prepare for the Certified Wireless Network Administrator (CWNA PW0104) exam

Prerequisite(s): MSNA1201

(3 C: 2 lect/pres, 1 lab)

**MSNA 2206 - Network Security**

This course is designed to expose security concepts to students. The student will recognize how to prevent hackers from entering their network, and if breached, detect the intrusion. 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 course will help prepare the student for the Security+ certification.

Course Outcomes:

- identify basic terminology of networking security
- recognize the basic design of various types of programmed threats used to attack networks
- apply authentication methods commonly used in networked environments
- simulate common methods used to attack computer networks
- plan for the implementation of anti-virus software
- list how to detect intrusion and plan to prevent malicious intrusion
- identify, recognize and plan to prevent physical security threats to a network
- prepare for Security+ certification

Prerequisite(s): MSNA1204, MSNA1212

(3 C: 2 lect/pres, 1 lab)

**MSNA 2211 - Linux**

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.

Course 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)

**MSNA 2215 - MSNA Internship**

The MSNA Internship is the capstone course for students enrolled in the MSNA major. Students entering the internship have already demonstrated their knowledge and abilities to perform entry level computer and network installation, configuration, maintenance, administration and repair. The internship is viewed as an entry level experience in the information technology (IT) workplace, and should be performed in an organization outside of the college. The internship may be either paid or unpaid.

Course 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
- 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
- complete all evaluations and assessments

(2 C: 0 lect/pres, 0 lab, 2 other)

**MSNA 2216 - Cisco (Exploration) Routing Protocols and Concepts**

This course provides a comprehensive theoretical and practical approach to learning the technologies and protocols needed to configure and verify router equipment, and to design and implement a class IP addressing scheme for a network. Upon completion of the course, students will have learned advanced configuration commands, and be able to identify the characteristics of distance vector routing protocols. This course is part of the four-part Cisco curriculum that prepares students for the CCNA certification exam.

Course Outcomes:

- configure and verify router interfaces
- demonstrate comprehensive RIPv1 configuration skills
- design and implement a classless IP addressing scheme for a network
- use advanced configuration commands with routers, implementing EIGRP
- apply the basic RIPv2 configuration commands and evaluate RIPv2 classless routing updates
- identify the characteristics of distance vector routing protocols
- describe the importance of routers to the functioning of the Internet
- explain the importance of correct configurations and configuration backups

Prerequisite(s): MSNA1204

(3 C: 1 lect/pres, 2 lab)

**MSNA 2218 - Cisco (Exploration) Accessing the WAN**

This course provides a comprehensive theoretical and practical approach to learning the technologies and protocols needed to configure and verify router equipment for connectivity to a Wide Area Network (WAN) and to the Internet. Students will learn how high bandwidth applications affect a network. They will learn to configure, verify and troubleshoot Dynamic Host Control Protocol (DHCP) and Domain Name Services (DNS) on a router. Students will also learn to verify PPP and Frame Relay connections on Cisco Routers, and to troubleshoot WAN implementations. This course is part of the four-part Cisco curriculum that prepares students for the CCNA certification exam.

Course Outcomes:

- describe the impact of applications (Voice and Video Over IP) on a network
- configure, verify and troubleshoot DHCP and DNS operations on a router
- verify, monitor and troubleshoot Access Control Lists in a network environment
- configure and verify a basic WAN serial connection, a PPP connection between Cisco routers and Frame Relay
- troubleshoot the various WAN technologies used in data communications
- understand the importance of correct configurations and configuration backups

(3 C: 1 lect/pres, 2 lab)

**MSNA 2220 - A+ Certification Prep- Essentials and 220-602**

A two-day seminar is to prepare students for taking the CompTIA A+ Certification Tests Essentials and 220-602, demonstrating their knowledge of microcomputer hardware, operating systems and software.

Course Outcomes:

- pass industry practice tests with a score of 90% or above, in practice outside of class, then demonstrate during the end of class assessment

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
* pass the Comp TIA A+ Essentials and 220-603 tests at an authorized testing site
* achieve greater self esteem and awareness as a result of their certification
* recognize the need for and value of certifications in the computer industry
Prerequisite(s): MSNA1200
(1 C: 1 lect/pres, 0 lab)

**MSNA 2221 - MS Server 2008 Administrator 70-646**
Students will study the skills needed to perform advanced administration of a Microsoft Windows 2008 server. Topics covered include selecting the appropriate Server 2008 edition, automating system deployments, understanding and planning Active Directory infrastructure, updating servers and monitoring system performance. This course also prepares students for the Microsoft 70-646 exam, the final in a series of exams leading to the MCITP designation.
Course Outcomes:
* understand the server core operating system
* automate server deployments
* plan infrastructure services
* plan Active Directory deployment
* design Active Directory infrastructure
* deploy domain services
* plan and deploy application, file, print and fax servers
* use virtualization
* plan and deploy server storage
* manage, monitor and update servers
* backup servers and data
Prerequisite(s): MSNA2201 (3 C: 2 lect/pres, 1 lab)

**MSNA 2222 - MS XP Pro 70-270 Cert Test Prep**
A two-day seminar is to prepare students for taking the Microsoft Certification Test 70-270, demonstrating their knowledge of MS Windows XP Professional.
Course Outcomes:
* pass industry practice tests with a score of 90% or above, in practice outside of class, then demonstrate during the end of class assessment
* pass the 70-270 test at an authorized testing site
* achieve greater self esteem and awareness as a result of their certification
* recognize the need for and value of certifications within the computer industry
Prerequisite(s): MSNA1202
(1 C: 1 lect/pres, 0 lab)

**MSNA 2228 - Cisco CCNA Cert Test Prep**
This two-day seminar will prepare students for taking the Cisco CCNA 640-802 certification exam and demonstrate their knowledge of the Cisco CCNA curriculum.
Course Outcomes:
* pass industry practice tests with a score of 90% or above, in practice outside of class, then demonstrate during the end of class assessment
* pass the Cisco CCNA (640-802) or both the ICND1 (640-822) and ICND2 (640-816) at an authorized testing site
* achieve increased marketability and promotion potential, as a result of their certification
* recognize the need for and value of certifications within the computer industry
(1 C: 1 lect/pres, 0 lab)

**MUSC 1320 - Music in World Culture**
Meets MN Transfer Goal Area 6 - Humanities and Fine Arts.
Musical creations have always been an expression of the values and perceptions of human beings. Music extends into many facets of life and touches all of our lives. This course will explore the nature of music through listening to live performances and through lectures and discussions relating to these performances. No musical background required.
Course Outcomes:
* develop writing skills through written reports of attended concerts
* develop opinions surrounding music
* explore the assumptions behind both popular and rock music
(3 C: 3 lect/pres, 0 lab)

**MUSC 1340 - History of Rock and Roll**
Meets MN Transfer Goal Area 6 - Humanities and Fine Arts.
History of Rock and Roll Music is a historical survey of rock music from 1920 to 1990 with emphasis on rock music as social history. This course will examine how significant events in American history of the last eighty years have been both reflected and influenced by rock music.
Course Outcomes:
* acquire basic knowledge of the classics of rock
* explain basic terminology of musical terms appropriate to the music studied
* identify basic characteristics of American contemporary music
* develop listening skills related to basic musical structure
* examine academic writing on the study of rock music
* explore the assumptions behind both popular and rock music
(3 C: 3 lect/pres, 0 lab)

**MUSC 1350 - Experiencing Live Music**
Meets MN Transfer Goal 6 - The Humanities
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.
Course Outcomes:
* develop basic skills of singing, including vocal technique (in speech and singing) and solo vocal performance
* develop a vocabulary about and an understanding of the vocal instrument
* 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
* develop an appreciation for vocal art as a cultural force in a civilized world
* write effectively using these terms and class topics for journal entries, quizzes, and concert reports
(3 C: 3 lect/pres, 0 lab)

**NURS 2400 - Nursing Transition**
This course builds on the foundations of the practical nursing curriculum and focuses on the professional role and discipline of nursing. The components and
application of the nursing process is introduced. The integration and application of professional values, beliefs, knowledge, skills, and experiences necessary for effective role transition from practical nurse to professional nurse is addressed.

Course Outcomes:
* define the scope of practice of the professional nurse
* differentiate the role changes and responsibilities necessary to transition from a LPN to professional nurse
* describe the ethical, legal, regulatory, Standards of Practice, and the purpose and role of state and national boards/agencies that apply to, guide, and create standards for safe and competent practice and healthcare delivery
* identify the various roles of the professional nurse in providing health care to individuals, families, and communities
* distinguish the stages of the nursing process as a systematic problem-solving method utilized in the provision of nursing care
* utilize the nursing process and critical thinking skills to develop a comprehensive client plan of care
* describe the professional nurse responsibility in the assessment and interpretation of data and evaluation of client outcomes
* demonstrate safe and satisfactory performance of basic nursing skills
* understand the use of evidence-based practice and research in nursing
* describe the significance of nursing theoretical concepts as a foundation for the practice of professional nursing
* demonstrate self-awareness by actively assessing personal learning needs, participating in self-assessment, and by identifying personal and professional goals and strategies for success

(2 C: 2 lect/pres, 0 lab)

NURS 2410 - Professional Nursing Practice I

This combined theory and clinical practicum course focuses on applying theoretical knowledge and concepts related to conditions of health and illness in medical, surgical, and specialty populations including the family in the care of children and childbearing phase. This course exposes the student to the professional discipline of nursing in which the nursing process is utilized to provide holistic care to individuals and families across the lifespan in health and wellness, promotion and maintenance, illness, and restoration of health. Emphasis is on skill development in assessment, clinical decision making, therapeutic nursing interventions, teaching-learning, communication, collaboration and care management with continued development of professional nurse behaviors, values and beliefs.

Course Outcomes:
* understand the etiology, pathophysiology, manifestations, diagnostics, complications, pharmacotherapeutics, and nursing management of medical/surgical disease processes
* provide care for clients across the lifespan experiencing alterations in health, with an emphasis on health promotion and illness prevention
* perform focused, systematic health assessments on clients of all ages
* utilize the nursing process to develop comprehensive client/family centered plans of care
* identify therapeutic, nursing interventions that are caring, compassionate, nurturing and client centered
* utilize effective clinical decision-making skills in providing and managing client care
* understand the importance of evidence-based practice and research in the provision of safe, competent nursing care
* safely and effectively perform nursing skills and procedures using judgment based on nursing knowledge
* utilize knowledge of the aging process in providing care for clients and families experiencing the effects of aging
* utilize therapeutic communication skills to establish relationships that facilitate positive client and family-centered outcomes
* apply teaching and learning principles to implement teaching plans for client education based on client and family learning needs
* collaborate effectively with other members of the multidisciplinary health team to ensure comprehensive provision of client care
* demonstrate nursing behaviors consistent with professional nursing values, beliefs, ethical and legal principles, and standards of nursing care
* identify cultural considerations in the assessment, planning and implementation of client care
* apply principles of growth and development in the provision and management of care for clients and families
* demonstrate competence in the theoretical knowledge and nursing care management of the care of children and the childbearing family

Prerequisite(s): NURS2400

(8 C: 5 lect/pres, 3 lab)

NURS 2420 - Professional Nursing Practice II

This combined theory and clinical practicum course expands and integrates theoretical knowledge, skills, and concepts relating to conditions of health and illness in medical, surgical, psychosocial, specialty populations, and clients with complex health conditions. This course increases student exposure to the practice of professional nursing while providing holistic care across the lifespan, with a specific focus on the aging population. Emphasis is on skill mastery in assessment, clinical decision making, caring nursing interventions, teaching-learning, communication, collaboration and care management. This course incorporates management of leadership concepts and skills supported by the continued development and application of professional nurse behaviors, values and beliefs. Focus is placed on enhancing student understanding of the graduate professional nurse’s dependent, interdependent and independent roles and responsibilities.

Course Outcomes:
* understand and integrate the etiology, pathophysiology, manifestations, diagnostics, complications, pharmacotherapeutics, and nursing care management of medical/surgical disease processes and psychosocial/behavioral alterations
* provide and manage care for multiple clients across the lifespan with alterations in health, with an emphasis on illness prevention and health promotion to achieve optimal outcomes
* perform comprehensive health assessments on clients of all ages
* utilize the nursing process to develop nursing diagnoses, caring nursing interventions, and evaluation and revision of care plans to meet client and family-centered outcomes
* identify therapeutic, nursing interventions that are caring, compassionate, nurturing and client centered and supported with rationale
* utilize effective clinical decision-making skills and judgment in providing and managing care of clients with culturally diverse needs and backgrounds
* apply evidence-based practice and research in the provision of culturally sensitive nursing care
* safely and effectively perform nursing skills and procedures using judgment based on nursing knowledge
* utilize knowledge of the aging process in providing and managing care for clients, families, and communities experiencing the effects of aging
* demonstrate therapeutic communication skills in interactions with clients and families, and effectively communicate with colleagues, and members of the health care team
* incorporate teaching and learning principles in the development and implementation of teaching plans for client education based on client needs, backgrounds, and cultural beliefs
* collaborate effectively with other members of the multidisciplinary health team in case management to ensure comprehensive client care, assist clients and families to access health and community resources, and provide continuity of care
* demonstrate nursing behaviors consistent with professional nursing values, beliefs, ethical and legal principles, and standards of nursing care
* demonstrate accountability and leadership in delegation and in the provision and management of nursing care
* integrate culturally sensitive considerations in the assessment, planning and implementation, and evaluation of client care
* incorporate the principles of leadership and management when prioritizing, organizing, providing and evaluating care for clients and families within urban and rural communities
* differentiate the roles and responsibilities of the graduate nurse entering into the practice of professional nursing

Prerequisite(s): NURS2410

(8 C: 5 lect/pres, 3 lab)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
PHIL 1310 - Introduction to Philosophy
Meets MN Transfer 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 minds? Just bodies? What difference might it make? What is it to lead a good human life? What is knowledge? What can we know, and how do we know it? Is reality independent of our minds? Is there a God? Students will be introduced to classical 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.
Course Outcomes:
* demonstrate knowledge of the scope and variety of philosophical thought as expressed in historical texts, figures, movements and religions
* explain these works as expressions of individual investigations into the ultimate basis of human experience and understanding
* articulate an informed, rationally supported personal reaction to these individual investigations
* critically analyze and articulate their own philosophical views concerning the nature of human experience and understanding
* analyze and synthesize views contrary to their own
* compare and contrast the sub-fields of metaphysics, epistemology, and ethics
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

PHIL 1320 - Ethics
Meets Transfer Goal Areas 6 and 9 - Ethical and Civic Responsibility and The Humanities.
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.
Course 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

PHIL 1340 - Introduction to Logic
Meets MN Transfer Goal Areas 2 and 4 - Critical Thinking and Mathematics.
This course begins by exploring the principles of inductive and deductive reasoning. The course includes traditional Aristotelian logic and modern symbolic logic, validity, invalidity, and proofs. Students will study various methods for proving validity in deductive arguments as well as for recognizing informal fallacies in logical reasoning. Topics include the method of counter-example, symbolic translation, Venn diagrams, truth table, deductive fallacies and categorial syllogisms. Since this course can be taken to fulfill the Mathematical-Logical Reasoning general education requirement, students should expect a Math-like course, with exercises and exams.
Course Outcomes:
* illustrate/demonstrate knowledge of historical and contemporary applications of logical systems
* explain what constitutes a valid logical proof from a variety of perspectives
* apply higher-order problem solving strategies
* understand how to translate arguments into standard form
* evidence the ability to translate verbal statements into symbolic statements
* understand and identify components of inductive and deductive arguments
* recognize common logical fallacies in argumentation
* evidence comprehension of intermediate inferences
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

PHIL 1360 - Comparative World Religions
Meets Mn Transfer Goal Areas 6 and 8 - The 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.
Course Outcomes:
* discuss the basic history, philosophies, and practices of major religious traditions and to begin comparative studies
* interpret religious values, images, symbols, and texts critically
* understand the role religion plays in culture and to improve (multi) cultural literacy
* be more effective about one’s own beliefs and more tolerant about the beliefs of others
* describe how religion has shaped and been shaped by civilizations, past, and present
* demonstrate an awareness of the scope and variety of artistic and literary expressions in religion
* articulate an informed personal reaction to artistic and literary works in various religions
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

PHYS 1300 - General Physics
Meets MN Transfer Goal 3 - Natural Sciences.
This is an introductory course in Physics and its applications. This course is designed for students who have no previous experience in physics. However, a good working knowledge of algebra is assumed. The primary goals of this course are to help individuals acquire a solid foundation in the basic theory and application of classical physics and to apply these skills through problem solving, simulation, and laboratory experiments. Topics include: linear and rotational motion, vectors, forces and equilibrium, work and energy, momentum, properties of solids, liquids and gases, heat and thermodynamics, waves and sound.
Course Outcomes:
* solve practical problems in all topic areas
* demonstrate and apply critical thinking skills to solve a variety of problems
* utilize the scientific method to verify or discover physical phenomena
* demonstrate the ability to work as a member of a team to achieve a common goal, by showing respect for other peoples 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 an awareness of global issues that are affected by the principles of physics
Prerequisite(s): TECH1500 or MATH1300 or MATH0480 or MATH0490 or Appropriate Accuplacer Score.
(4 C: 3 lect/pres, 1 lab)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
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.
Course 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 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, 2 lab)

PLBG 1508 - Plumbing Calculations I
This course will apply mathematics to plumbing calculations in developed lengths of pipe, fitting allowances, offsets, areas, volumes, diameters, weights and pressures. Students will also use formulas common to the industry.
Course Outcomes:
* solve formulas, decimals, fractions, square roots, angle measurement and conversion of length measurements
* calculate allowances for pipe fittings
* calculate equal spacing and angles
* solver 45-degree diagonals and pipe lengths
* solve for various center to center and end to end pipe calculations
* calculate for slope and drop
* solve elevations and grade
* calculate rolling offsets
* solve pipe length calculations
* calculate water measure, rectangular solids and cylinders
* solve for parallel offsets
* solve for water pressure, head and force
* calculate pipe sizing and ration of pipe capacities
(4 C: 1 lect/pres, 2 lab)

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.
Course Outcomes:
* define and comprehend words and terms related to plumbing
* comprehend basic and general plumbing principles
* identify materials used for pipes, fittings, joints and connection
* comprehend and apply the principle of traps, cleanouts and identify the materials they are made of
* identify fixture materials and their usage and be aware of installation procedures
* comprehend the principals of interceptors, separators and backwater valves
* identify component parts of hangers and demonstrate knowledge of the installation procedures for hangers and supports
* comprehend the principles of indirect and special wastes
(3 C: 3 lect/pres, 0 lab)

PLBG 1514 - Minnesota State Plumbing Code II
Students will study the Minnesota Plumbing Code which covers the laws, rules and regulations of plumbing installed in Minnesota including plumbing principles, materials, traps and fixtures, water supply and drainage, waste and vent systems used in construction, repair and remodeling of buildings.
Course Outcomes:
* comprehend component parts, potable water installation and protection from backflow and backspionage
* identify component parts and understand installation procedures for drainage, waste, and vent systems in residential buildings
* describe the principles of storm drainage systems
* apply principles of inspections and test of residential plumbing systems
* explain the qualifications of licensed plumbers and the steps taken to qualify for a plumbing license and when the test is given
* design a water system for a residence and apartment buildings
* utilize useful information used in plumbing including weights and measurements, pressure and heads, geometric calculations and pipefitting angle calculations
Prerequisite(s): PLBG1510
(3 C: 3 lect/pres, 0 lab)

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 cost 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.
Course Outcomes:
* understand Architects scale
* interpret and draw simple orthographic drawings
* comprehend 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 their labor cost
* list all fixtures and estimate materials and labor cost
* recap all labor and materials cost including markup and profit
* write up labor and materials estimate and submit bid for projects
(4 C: 1 lect/pres, 3 lab)

PLBG 1520 - Blueprint Reading and Estimating II
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 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 roof drain systems including how to size, draw and estimate the cost of a storm water disposal system.
Course Outcomes:
* interpret architectural drawings for complex residential and light commercial applications
* prepare isometric sketches of complex residential and light commercial projects
* prepare isometric drawings to solve construction problem situations
* complete piping layouts according to blueprint
* estimate piping and materials for complex residential and light commercial projects
* interpret complex residential and commercial blueprints
* read mechanical blueprints
* plan piping layouts according to the blueprint requirements
Prerequisite(s): PLBG1518
(3 C: 1 lect/pres, 2 lab)

PLBG 1524 - Plumbing Calculations II
The application of mathematics to plumbing calculations in developed lengths of pipe, fitting allowances, offsets, areas, volumes, diameters, weights and pressures. Students will also use formulas common to the industry. Emphasis will be put on estimating plumbing jobs. Calculation of profit margin percentages as it relates to

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to the plumbing industry.

Course Outcomes:
* solve formulas, decimals, fractions, square roots, angle measurement and conversion of length measurements
* calculate allowances for pipe fittings
* calculate equal spacing and angles
* solve 45 degree diagonals and pipe lengths
* solve various center/center and end/end pipe calculations
* calculate for slope and drop
* solve elevations and grade
* calculate rolling offsets
* solve pipe length calculations
* calculate water measure, rectangular solids and cylinders
* solve for parallel offsets
* solve for water pressure, head and force
* calculate pipe sizing and ration of pipe capacities

Prerequisite(s): PLBG1508
(3 C: 1 lect/pres, 2 lab)

**PLBG 1530 - Piping Procedures II**

Students will study the assembly of Cast Iron hub and no-hub soil and waste pipe and fittings. Students will join Cast Iron hub type neoprene and fabricate projects in no hub pipe. Students will fabricate steel piping projects using the fundamentals of cutting, threading, grooving of piping, identify fittings and apply sealants to piping. Students will learn the standard installation procedures of common plumbing fixtures and appliances, which comply with the Minnesota Plumbing Code requirements.

Course Outcomes:
* identify different kinds of steel and cast iron Pipe and fittings
* operate hand powered steel and cast iron pipe cutting tools
* operate gas powered cast iron cutting tools
* operate steel and cast iron assembly tools
* operate electric power steel cutting and threading tools
* comprehend various types of hangers
* fabricate and assemble steel and cast iron projects
* 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
* install and repair faucets
* identify parts of hydronic heating system
* understand modern hydronic heating

Prerequisite(s): PLBG1504
(3 C: 1 lect/pres, 2 lab)

**PLBG 1538 - Plumbing Internship**

Students will work in a sponsoring plumbing-related business applying knowledge, concepts and skills learned in the classroom.

Course Outcomes:
* complete a series of plumbing tasks which will vary from plumbing business to plumbing business but will be germane to plumbing in general and the shop in particular
* show up for work, dressed appropriately, with handtools and safety equipment, on time
* complete assigned tasks
* follow rules and regulations of the employer
* complete all assigned responsibilities as required

(2 C: 0 lect/pres, 0 lab, 2 other)

**PLBG 1544 - Career Planning/Customer Relations**

The student will write a telephone script, fill out a job application, complete an employer ready cover letter and resume. Students will write short, intermediate and long term personal and professional goals. Students will study the fundamentals of good customer relations and apply them in their daily working lives. Students will participate in discussions with guest prospective employers.

Course Outcomes:
* complete a letter of application/cover letter
* complete a job application
* complete a phone script
* complete an employer ready resume
* compile short, intermediate and long term goals
* participate in presentation by potential employers
* study fundamentals of good customer relations

(1 C: 0 lect/pres, 1 lab)

**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.

Course 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
* demonstrate the ability to work as a member of team to achieve a common goal, by showing respect for other peoples 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)

**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.

Course 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 peoples 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)

**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.

Course 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 peoples 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)

**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.

Course 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.

(3 C: 3 lect/pres, 0 lab)

**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.

Course 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.

(3 C: 3 lect/pres, 0 lab)

**PRSG 2401 - Medical Surgical Nursing I**

This course explores the basic conditions and diagnostics related to the human body systems. You will also recognize the concepts of transcultural nursing and the needs of the aging population. This course includes medical terminology, pathology, signs and symptoms, treatment and nursing interventions of acute and chronic disorders.

Course Outcomes:
* identify the various concepts of transcultural nursing
* recognize the physical and psychosocial effect of aging and nursing interventions
* describe oncology, respiratory, cardiovascular, endocrine, immune, and integumentary, neurological, musculoskeletal, hematopoietic, gastrointestinal and genitourinary disorders including: diagnostic testing, signs and symptoms, medical and nursing interventions, patient teaching concepts, community resources

Corequisite(s): PRSG2409, PRSG2419, PRSG2429, PRSG2439

(3 C: 3 lect/pres, 0 lab)

**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. This course will also include an introduction to basic nutrition and its’ relationship to health. This course is developed in units and assists the students to move from knowledge to application.

Course Outcomes:
* describe how health and illness are inter-related when providing therapeutic care to a client
* describe the health illness continuum
* describe the necessity of documenting client care
* list the process of and data collection techniques during a physical examination
* identify the role of the practical nurse in the contemporary health system
* recognize and apply the nursing process and critical thinking
* describe nurse patient interaction and the application of therapeutic communication techniques
* describe the essentials of medical surgical asepsis
* discuss the theory related to the principles of procedures
* describe the body’s use of nutrients and the contribution to health
* discuss the six basic nutrients, their food sources and functions

(3 C: 3 lect/pres, 0 lab)

**PRSG 2410 - Advanced Nursing Role Concepts**

In this course the student will synthesize learning that has occurred in prior Practical Nursing theory and lab classes. The student will focus on integrating topics and skills that relate to the graduate role. The student will acquire needed knowledge and will develop autonomy to assure success in the transitional process from student to beginning practitioner. The student will review test taking techniques and the format for a systematic review for the State Board Examination. Additionally, this course illustrates employer-employee and consumer relations along
with successful completion of a service-learning project.

Course Outcomes:
* explore nursing’s historical perspectives and future trends in nursing
* identify the scope of legally practicing as a Licensed Practical Nurse
* review the role of the State Board of Nursing
* explore the role of the LPN as a member of the health care team
* identify ethical and legal framework parameters as they relate to the practice of the LPN
* understand nursing theory and concepts required to successfully practice as an LPN
* prepare for the job seeking experience
* design and complete a service-learning project
* identify the role of NCLEX review resources
* demonstrate base knowledge through the completion of NCLEX examinations
(3 C: 3 lect/pres, 0 lab)

PRSG 2419 - Nursing Skills
In this course the student will develop psychomotor skills, which are applied to a diverse range of patient problems in a variety of health care settings. Skills include medication administration, data collection, reporting, recording and documentation, medical and surgical asepsis and nurse patient interactions. The student will also acquire skills specific to various body systems necessary to complete patient care.

Course Outcomes:
* demonstrate the ability to perform the nursing skills related to data collection, reporting, recording and documentation
* demonstrate the ability to perform the nursing skills related to medication administration
* demonstrate the ability to perform the nursing skills related to medical and surgical asepsis
* demonstrate the ability to perform the nursing skills related to nurse patient interactions
* demonstrate the ability to perform the nursing skills related to the integumentary system
* demonstrate the ability to perform the nursing skills related to the neurosensory systems
* demonstrate the ability to perform the nursing skills related to the cardiovascular/respiratory systems
* demonstrate the ability to perform the nursing skills related to the digestive/elimination systems
* demonstrate the ability to perform the nursing skills related to fluid and electrolyte balance
(3 C: 1 lect/pres, 2 lab)

PRSG 2429 - Essentials of Clinical Pharmacology
In this course students will acquire introductory pharmacology information. Students will acquire the knowledge related to medications referencing and medication classifications including dose, expected action, side effects, and untoward effects and nursing implications. Students will study conversions and drug calculations and IV fluid rate calculations.

Course Outcomes:
* discuss the drug classification system
* demonstrate the use of drug reference materials in identifying specific drug classifications, action, side-effects and interactions
* interpret abbreviations and symbols used in medication orders
* communicate with licensed staff/clients/clients families the need for and effects of medication
* discuss consumer safety related to medications
* the body processes review medications source and drugs
* interpret the terminology and abbreviations related to medication administration
* demonstrate drug calculations and conversions
(2 C: 2 lect/pres, 0 lab)

PRSG 2439 - Clinical Application I
In this course the student will implement the nursing process and nursing skills in simulation, sub acute and long term nursing care settings.

Course Outcomes:
* distinguish the roles and responsibilities of the practical nurse related to the health illness continuum
* practice the ability to utilize the nursing process and document on care summaries
* demonstrate skills related to activities of daily living, utilizing standard precautions
* demonstrate nursing skills and procedures
* administer medications utilizing the six rights
* demonstrate the ability to utilize therapeutic communication with clients, staff and co-workers
* demonstrate personal and professional nursing behaviors and reflect personal grooming standards
* observe roles of various health care providers
(3 C: 0 lect/pres, 3 lab)

PRSG 2440 - Clinical Application II
In this course the student will have the opportunity to implement the nursing process and nursing skills in a variety of settings that may include: simulation, acute, sub acute and long term nursing care settings. The student will integrate the theory and skills from previous theory and clinical course in increasing complex nursing situations.

Course Outcomes:
* distinguish the roles and responsibilities of the practical nurse related to the health illness continuum
* practice the ability to utilize the nursing process and document on care summaries
* demonstrate critical thinking skills utilizing the nursing process
* demonstrate advanced nursing skills and procedures
* administer medications utilizing the six rights
* demonstrate the ability to utilize therapeutic communication with clients, staff and co-workers
* demonstrate the ability to complete multiple client assignments within a given time frame
* demonstrate personal and professional nursing behaviors and reflect personal grooming standards
* compare and contrast the roles of various health care providers
(5 C: 0 lect/pres, 5 lab)

PRSG 2450 - Family Health Nursing
This course uses a family centered approach to introduce the student to the concepts of antepartum nursing, principles of labor, delivery, postpartum and newborn nursing care. In addition, this course provides the student with an opportunity to identify the physiological and psychological responses of children and families to illness. Nursing care concepts and the application of the nursing process are reflected in home, hospital and community settings.

Course Outcomes:
* describe fetal development, prenatal care, and the physical and psychological changes of pregnancy
* describe diagnostic procedures related to pregnancy including complications and nursing management
* describe the nursing care during labor, delivery, c-section and the post partum period
* describe postnatal nursing care, family bonding and community support systems
* describe child welfare history, principles of growth and development, health promotion and immunization
* describe physical and psychological care of the ill child
* describe nursing care of the pediatric body systems
(3 C: 3 lect/pres, 0 lab)

PRSG 2460 - Mental Health Nursing
In this course the student will have the opportunity to build on their understanding of human behavior and therapeutic communication skills. The student will
discover how key nurses have influenced mental health nursing of today. The student will also be introduced to basic information and nursing interventions that enables monitoring the cognitive affect and behavioral functioning of clients. Course Outcomes:
* recognize the role of therapeutic communication and defense mechanisms in the nursing care of the client with mental health disorders
* define HIPAA and its role in mental health care delivery
* apply the concepts of personality development, developmental tasks and parenting styles to mental health nursing
* identify classifications, uses, actions, side effects and nursing as well as considerations for selected psychoactive medications
* identify diagnostic tests and procedures related to diagnosing mental health alterations
* identify 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
* discuss the characteristics of substance abusers

(2 C: 2 lect/pres, 0 lab)

**PSYC 1300 - Introduction to Psychology**
Meets MN Transfer Goal 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, personality, and disorders.
Course Outcomes:
* identify, understand and apply the basic terminology and concepts of psychology
* understand and employ psychological and scientific methods, data collection and analysis to investigate human behavior
* use and critique alternative explanatory systems and theories in relationship to understanding behavior and mental processes
* utilize psychological methods and tools as part of self discovery and developing greater insight into one’s life and other people
* examine the evolving science of psychology over time
* understand how different cultural perspectives influence the science and practice of psychology
* demonstrate and apply critical thinking skills to analyze a variety of psychological phenomena
* work cooperatively, creatively and effectively in groups and show respect for other people’s needs, ideas and feelings
* model professional and responsible behavior by being on time, participating in class activities and discussions, and completing assignments on time
* demonstrate effective use of resources including faculty, other students, reference materials, and the internet
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

**PSYC 1304 - Life Span Developmental Psychology**
Meets MN Transfer Goal 5 - History/Social, 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 contacts 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.
Course Outcomes:
* identify terminology and concepts
* explain the scientific methodologies used in developmental psychology
* describe the main theories and critically analyze scientific evidence regarding those theories
* analyze developmental events from different theoretical perspectives
* integrate developmental theory and research with naturalistic and/or other observations of individuals at various stages of development in a written report
* verbally and pictorially trace their personal development and projected development across the developmental life stages
* evaluate current developmental public policy issues and how they relate to diversity
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

**PSYC 1310 - Psychology of Women**
Meets MN Transfer Goal 5 and 9- History/Social, Behavioral Sciences and Ethical and Civic Responsibility. 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. The class will compare feminist theories and research with other theories that are sex biased.
Course Outcomes:
* compare theories and critically examine biases relevant to the psychological factors shaping the lives of women
* explore the psychological affects of dominance, and subordination in women’s relationships
* examine the beliefs and theories regarding women’s sexuality and it’s impact
* identify contributions of historical and contemporary women psychologists
* examine the cultural messages which affect women’s development
* examine up-to-date studies in the field
* improve research skills and knowledge in understanding and interpreting research
* be familiar with and to understand feminist theories and research
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

**PSYC 2310 - Abnormal Psychology**
Meets MN Transfer Goal Area 5 - History, Social and 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.
Course 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 psychiatric disorders
* identify the gender, cultural, psychological, biochemical, and environmental factors which predispose individuals toward mental disorders
* compare the different approaches used in treating mental illness including psychotherapy, medical, and non-psychiatric methods such as 12 step programs
* utilize research and statistics to answer questions about mental illness and its impact on society
* examine how legal issues influence the treatment of mental illness
Prerequisite(s): READ0304, ENGL0304 or GBEH1300 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

**READ 0300 - Reading and Vocabulary**
This course will focus on basic reading comprehension and vocabulary development. Students will explore reading and vocabulary through a variety of materials, including novels, magazines, newspapers, Internet, and technical resources. Students will increase their general vocabulary, and will explore technical terminology unique to their interests. This course is developmental and does not fulfill a general studies requirement.
Course Outcomes:
* practice reading regularly to strengthen the comprehension and understanding of written materials
* recognize the common roots, suffixes and prefixes of general vocabulary for greater word identification and meaning
* utilize materials to enhance a working knowledge of technical terms distinctive to selected careers and courses

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
READ 0304 - Reading Strategies
Expands students’ ability to successfully use reading strategies for achievement in college courses. Course material will focus on textbooks and other types of reading materials prevalent in technical courses. This course is developmental and does not fulfill a general studies requirement.
Course Outcomes:
* understand the benefit and demonstrate usage of the different parts of a textbook for vocabulary and reading comprehension
* develop techniques to deal with personal strengths and weaknesses in reading comprehension and in building vocabulary
(3 C: 2 lect/pres, 1 lab)

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.
Course 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): READ0300 or EAP0331 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

SAMG 1199 - Principles of Marketing - Modified Course for Tech Prep
This course is an introduction to the marketing process. Discussion includes selecting target markets, creating short and long-term goals, identifying customer wants and needs, providing customer satisfaction, and developing the marketing mix to appeal to targets. Students will apply topics covered to create marketing plan presentations for designated products.
Course Outcomes:
* define marketing and discuss its core concepts
* explain functional planning strategies and assess marketing’s role in strategic planning
* describe the steps in target marketing
* list and define the steps in the new product development process
* describe the major strategies for pricing products
* identify the major channel alternatives
* outline the steps in developing quality marketing communications
* discuss the major steps in the marketing plan
(3 C: 3 lect/pres, 0 lab)

SAMG 1200 - Principles of Marketing
This is an overview of basic marketing principles and practices. This course includes discussion on the marketing mix, identifying customer needs and wants, determining target markets, and creating appropriate products, services and programs to serve these markets.
Course Outcomes:
* define marketing and discuss its core concepts
* explain functional planning strategies and assess marketing’s role in strategic planning
* describe the steps in target marketing
* list and define the steps in the new product development process
* describe the major strategies for pricing products
* identify the major channel alternatives
* outline the steps in developing effective marketing communications
* discuss the major steps in the marketing plan
(3 C: 3 lect/pres, 0 lab)

SAMG 1210 - Customer Service/Sales Techniques
This course covers a fundamental customer service and sales approach that can be used as a foundation for a future in customer service and sales. The content covers the importance of a positive attitude, listening, communication styles and skills, the basic steps of quality service and the basic steps of the sale.
Course Outcomes:
* present a product, service or idea in an organized and persuasive manner
* communicate effectively in a culturally diverse environment
* build a shared vision in customer service and sales situations
(3 C: 2 lect/pres, 1 lab)

SAMG 1215 - Principles of Management
This introductory course gives students an overview of the management process, tracking the historical aspects through to current management principles and practices. The course explores the management functions of planning, organizing, leading, and controlling, and focuses on trends in quality improvement, team building and leadership skills.
Course Outcomes:
* describe essential management functions, skills and roles
* describe organizational and staffing models
* demonstrate knowledge of leadership characteristics, skills and behaviors, and their impact on employee motivation and performance
* use a basic problem-solving model
* use key communication channels to insure results
* understand processes for quality improvement, team building, and leadership development
(3 C: 3 lect/pres, 0 lab)

SAMG 1220 - Sales Promotion/Advertising
The course covers the fundamentals of sales promotion, the types of promotional tools available, and effective use of those tools. The course also focuses on advertising including: the various types of retail advertising options, the parts of the advertisement, and the creation of a promotion plan as a part of class work.
Course Outcomes:
* define advertising and promotion and demonstrate an understanding of the role of advertising in the promotion of a product/service
* identify different media types, and examine the cost/benefit of each
* identify, create and present different advertisement layouts
* understand how target marketing affects sales promotion and advertising
* develop and present a promotion plan, inclusive of an advertising/promotion budget
* analyze and critique different types of media advertisements
(3 C: 3 lect/pres, 0 lab)

SAMG 1224 - Business Ethics and Law - Modified Course for Tech Prep
This course involves an explanation of ethical issues as they relate to business
and general law. Topics include the legal system in the United States, the function, organization, and work of the federal and state court systems, and criminal and civil law. Important areas of business law are covered including contracts, sales, and consumer protection.

Course Outcomes:
* define and understand the relationship between law and ethics
* learn how the court system in the United States functions
* demonstrate knowledge of contract law
* understand the law as it pertains to the purchase and sale of goods under the UCC
* become familiar with OSHA guidelines
* learn how business law protects the consumer
* identify ethical issues in business

(C: 3 lect/pres, 0 lab)

**SAMG 1225 - Business Ethics and Law**

This course involves an explanation of ethical issues as they relate to business and general law. Topics include the legal system in the United States, the function, organization, and work of the federal and state court systems, and criminal and civil law. Important areas of business law are covered including contracts, sales, and consumer protection.

Course Outcomes:
* define and understand the relationship between law and ethics
* learn how the court system in the United States functions
* demonstrate knowledge of contract law
* understand the law as it pertains to the purchase and sale of goods under the UCC
* become familiar with OSHA guidelines
* learn how business law protects the consumer
* identify ethical issues in business

(3 C: 3 lect/pres, 0 lab)

**SAMG 1235 - Supervised Occupational Experience**

This course is designed to provide the student with a purposeful occupational experience in the sales and marketing industry. Since each Supervised Occupational Experience is an individualized experience, a training plan is specifically created for each student in conjunction with the training station the student is assigned to. This can be offered as a cooperative arrangement, an internship arrangement or other appropriate work experience arrangement.

Course Outcomes:
* demonstrate occupational competency for either/or marketing, management, customer service and sales
* understand the daily workings of business
* identify the customer service skills required in business
* identify the marketing skills demonstrated in business
* relate the professional approach between management and employees

(2 C: 0 lect/pres, 0 lab, 2 other)

**SAMG 1240 - Professional Self Development**

This course focuses on the importance of the professional organization and community service as a part of the career picture. The course allows students to develop self-confidence, practice leadership and management skills while involved in a professional organization.

Course Outcomes:
* develop social and business etiquette
* demonstrate civic responsibility
* create a portfolio that will provide an effective transition from college to work
* demonstrate leadership ability

(1 C: 1 lect/pres, 0 lab)

**SAMG 1245 - Sales and Marketing Math**

This course covers the application of mathematics functions to the solution of business marketing and management problems and how they relate to the effective methods of improving the profitability of the business. Explanation of business procedures, terminology and documents within the mathematical environment are provided to aid in student understanding and application.

Course Outcomes:
* define and understand the relationship between law and ethics
* learn how the court system in the United States functions
* demonstrate knowledge of contract law
* understand the law as it pertains to the purchase and sale of goods under the UCC
* become familiar with OSHA guidelines
* learn how business law protects the consumer
* identify ethical issues in business

Prerequisite(s): MATH0380 or Appropriate Accuplacer Score.

(3 C: 2 lect/pres, 1 lab)

**SAMG 1250 - Fundamentals of Sales Accounting**

This course involves an explanation of ethical issues as they relate to business and general law. Topics include the legal system in the United States, the function, organization, and work of the federal and state court systems, and criminal and civil law. Important areas of business law are covered including contracts, sales, and consumer protection.

Course Outcomes:
* knowledge of basic accounting terminology and definitions
* knowledge of accounting processes and procedures
* understanding of the use of ledgers and journals
* ability to analyze financial statements to determine ROI (return on investment)
* ability to analyze financial reports to determine profitability of the business
* understand the need for problem solving and critical thinking as it relates to the marketing, sales and business management environments
* knowledge of the financial terminology related to merchandising
* identify the major forms of direct marketing
* identify the major forms of international marketing organization
* define customer value and satisfaction
* explain the effect of the Internet on electronic commerce
* define customer value and satisfaction
* explain the fundamentals of competitive marketing strategies
* describe the key approaches to entering foreign markets
* identify the major forms of international marketing organization
* write a marketing plan
* implement and analyze a marketing plan
* explain the strategic planning process
* describe the steps in the marketing planning process
* design business portfolios and growth strategies
* integrate knowledge of the functional areas
* list the marketing management functions

Prerequisite(s): SAMG1200

(3 C: 3 lect/pres, 0 lab)

**SAMG 2245 - Marketing Management**

This course involves an explanation of ethical issues as they relate to business and general law. Topics include the legal system in the United States, the function, organization, and work of the federal and state court systems, and criminal and civil law. Important areas of business law are covered including contracts, sales, and consumer protection.

Course Outcomes:
* knowledge of the financial terminology related to merchandising
* identify the major forms of direct marketing
* identify the major forms of international marketing organization
* define customer value and satisfaction
* explain the effect of the Internet on electronic commerce
* define customer value and satisfaction
* explain the fundamentals of competitive marketing strategies
* describe the key approaches to entering foreign markets
* identify the major forms of international marketing organization
* write a marketing plan
* implement and analyze a marketing plan
* explain the strategic planning process
* describe the steps in the marketing planning process
* design business portfolios and growth strategies
* integrate knowledge of the functional areas
* list the marketing management functions

Prerequisite(s): SAMG1200

(3 C: 3 lect/pres, 0 lab)

**SAMG 2255 - Applied Sales Strategies/Telemarketing**

This course involves an explanation of ethical issues as they relate to business and general law. Topics include the legal system in the United States, the function, organization, and work of the federal and state court systems, and criminal and civil law. Important areas of business law are covered including contracts, sales, and consumer protection.

Course Outcomes:
* knowledge of the financial terminology related to merchandising
* identify the major forms of direct marketing
* identify the major forms of international marketing organization
* define customer value and satisfaction
* explain the effect of the Internet on electronic commerce
* define customer value and satisfaction
* explain the fundamentals of competitive marketing strategies
* describe the key approaches to entering foreign markets
* identify the major forms of international marketing organization
* write a marketing plan
* implement and analyze a marketing plan
* explain the strategic planning process
* describe the steps in the marketing planning process
* design business portfolios and growth strategies
* integrate knowledge of the functional areas
* list the marketing management functions

Prerequisite(s): SAMG1200

(3 C: 3 lect/pres, 0 lab)

**PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.**
A. present and demonstrate features and benefits
B. understand and use a variety of closing techniques
   * define customer follow up techniques
   * define value added and illustrate from personal experience
   * use effective sales language and verbal and mental visualization
   * learn personality profile(s) and how to adjust to personalities
   * construct telephone scripts and voice mail messages
   * present telephone appointment call
Prerequisite(s): SAMG1210
(3 C: 2 lect/pres, 1 lab)

SAMG 2260 - Management Computer Applications
The focus on this course is the interpretation of accounting and financial records using the computer. Reports, projections and systems will also be studied along with Power Point, and Excel.
Course Outcomes:
* create spreadsheets to interpret accounting and financial records
* perform word processing for merging various types of business letters and printing envelopes
* create and run database techniques to query and create customer database files
* create and present a sales/marketing/promotion presentation using presentation software
* maintain a personal calendar using management software for daily and future organization of clients and business
Prerequisite(s): CPTR1210
(3 C: 2 lect/pres, 1 lab)

SAMG 2270 - Human Resource Management
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.
Course 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
(3 C: 2 lect/pres, 1 lab)

SAMG 2276 - Marketing Research
This course is designed to present basic principles of sales management. This course will help the student to understand the organization and functions of managing a selling force. Coverage includes information on budgeting, setting sales goals, leading a sales force, team building, team conflict, and measuring sales force performance in the field.
Course Outcomes:
* define and understand how to lead a sales force, inclusive of developing and utilizing various motivational techniques
* understand how business/financial statements, budgets, and sales force training affect a business’s sales management
* learn the importance of, and how to assign sales quotas and sales territories
* demonstrate the ability to forecast sales based on market factors and effective time management
* understand reasons why customers will not buy from the sales person, utilizing the consultative sales person approach
Prerequisite(s): CPTR1210
(3 C: 2 lect/pres, 1 lab)

SAMG 2280 - Sales Management
This course is designed to present basic principles of sales management. This course will help the student to understand the organization and functions of managing a selling force. Coverage includes information on budgeting, setting sales goals, leading a sales force, team building, team conflict, and measuring sales force performance in the field.
Course Outcomes:
* define and understand how to lead a sales force, inclusive of developing and utilizing various motivational techniques
* understand how business/financial statements, budgets, and sales force training affect a business’s sales management
* learn the importance of, and how to assign sales quotas and sales territories
* demonstrate the ability to forecast sales based on market factors and effective time management
* understand reasons why customers will not buy from the sales person, utilizing the consultative sales person approach
Prerequisite(s): CPTR1210
(3 C: 2 lect/pres, 1 lab)

SAMG 2285 - Entrepreneurship/Small Business Management
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.
Course 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 an Entrepreneurship/Small Business Management Small Business Plan
Prerequisite(s): SAMG1200, SAMG1210, CPTR1210
(3 C: 2 lect/pres, 1 lab)

SOCI 1310 - Introduction to Sociology
Meets MN Transfer Goal 5 - History and the Social and Behavioral Sciences. This course introduces students to the basic concepts, theories, and perspectives of sociology. Social interaction, social structure, social relationships, and stratification are analyzed to deepen understanding of how individuals function within larger social contexts. Students will use sociological data, concepts and theories to think critically about social institutions.
Course Outcomes:
* understand sociological perspectives
* apply basic sociological concepts to the study of social interactions
* examine social structure, and social groups
* use 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
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

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.
Course Outcomes:

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
analyze and evaluate current responses to social problems surrounding food and
examine how food issues reflect larger social forces
analyze the impact of corporate food structures on farmers and communities
analyze the structure of globalized, industrialized agriculture and food systems
examine the impacts of corporate dominance on the global food supply
explore the structural relations of power regarding the production, distribution, and inequality. This course explores the social world(s) we live in by analyzing issues in society as they examine how these processes relate to structures of power

Course 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

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 and family are looked at from both theoretical and practical perspectives.

Course Outcomes:
* 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.

(3 C: 3 lect/pres, 0 lab)

**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 and family are looked at from both theoretical and practical perspectives.

Course 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.

(3 C: 3 lect/pres, 0 lab)

**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.

Course 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.

(3 C: 3 lect/pres, 0 lab)

**SPAN 1320 - Beginning Spanish II**

Meets MN Transfer Goal Area 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 the first semester includes the past tenses, the subjunctive, the command forms, 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.

Course Outcomes:

* write grammatically correct paragraphs in Spanish using increasingly advanced vocabulary
* summarize and explain basic to intermediate written and spoken Spanish
* apply advanced beginning level grammar and vocabulary to oral communicatio-

**PLEASE NOTE:** All program plans are preliminary and curriculum may change without notice.
tion
* 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): SPAN1310
(4 C: 4 lect/pres, 0 lab)

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)

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 so-
cial sciences. Students examine their world and current national and international
issues from the perspectives of anthropology, sociology, political science, history,
psychology and economics.
Course 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 is-
issues such as poverty, homelessness, crime, racism
Prerequisite(s): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

SURG 1400 - Medical Microbiology
This course will enable you to recognize how you can prevent the spread of
disease and promote wound healing. You will study the structure and function
of microorganisms, the various diseases caused by pathogenic microorganisms,
and the methods of transmission of disease. Various methods of sterilization and
disinfection will be studied. You will classify wound types and study the wound
healing process in conjunction with the body’s defenses against disease. You will
also learn to protect yourself by studying the concept of standard precautions.
Course Outcomes:
* define microbiological terms
* describe the structure and function of microorganisms
* recognize diseases caused by pathogenic microorganisms
* describe how disease are spread
* explain means of controlling the spread of diseases
* describe the wound healing process and the factors affecting this process
(2 C: 2 lect/pres, 0 lab)

SURG 1404 - Surgical Pharmacology
This course will enable you to assist in the preparation of drugs used in the oper-
ating room. You will study the uses, routes of administration, equipment needed
and possible side effects of these drugs. The metric and apothecary systems of
measure will be studied. You will convert standard time to military time, do
temperature conversions, and study how to prepare a solution. Emphasis will be
placed on the legal and safety aspects of drug administration.
Course Outcomes:
* define pharmacological terms
* recognize the effects of various surgical drugs, routes of administration and
possible side effects
* identify and demonstrate equipment needed for administration of drugs
* use metric and apothecary systems of measure

* convert standard time to military time
* describe the legal and safety principles of drug/anesthesia administration in the
operating room
Prerequisite(s): HLTH1440, BLGY2320 or HLTH1444, HLTH1440, MATH0380
or Appropriate Accuplacer Score.
(2 C: 2 lect/pres, 0 lab)

SURG 1420 - Operating Room Techniques
This course will enable students to recognize the surgical technologist as an es-
ential 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.
Course 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 documenta-
tion
* discuss aseptic technique and safety for the student and patient
* discuss attitudes toward death and dying and the grief process
Corequisite(s): SURG1400, SURG1404, SURG1424
(3 C: 3 lect/pres, 0 lab)

SURG 1424 - Operating Room Techniques Lab
This course will enable students to perform fundamental operating room skills, to
identify instruments and to prepare supplies necessary for surgical case manage-
ment. Included will be a basic knowledge of Electricity, Physics and Robotics.
Students will accomplish this by having the opportunity to observe, practice and
demonstrate these skills in a lab setting. Emphasis will be placed on demonstrat-
ing the principles of aseptic technique as they apply to skills inherent in the role
of the surgical technologist.
Course Outcomes:
* classify, identify and pass instruments in specific sets
* demonstrate surgical attire and principles of aseptic technique displaying
professional behavior
* demonstrate patient positions, preparation of surgical site and practice draping
* demonstrate operating room preparation preoperatively, intraoperatively and
postoperatively for surgical procedure
* prepare surgical supplies and instruments necessary for a surgical procedure
* acquire a beginning knowledge of Electricity, Physics and Robotics
Prerequisite(s): BLGY2320, HLTH1440 or HLTH1444, HLTH1440
(4 C: 0 lect/pres, 4 lab)

SURG 1442 - Surgical Procedures I
This course will enable students to understand various types of surgical proce-
dures. Students will accomplish this by studying surgical anatomy, abnormalities,
and the preoperative, intraoperative, and postoperative processes as they relate
to each type of surgery. Students will relate the knowledge learned in previous
theoretical courses to specific surgical procedures. The types of cases to be studied
will include laparotomies, herna repairs, and surgeries performed on the repro-
ductive, urinary, digestive, skeletal, muscular, endocrine, sensory, respiratory and
nervous system organs. This course will also enable students to seek employ-
ment. Students will write a letter of application and a resume and follow-up
letter. Students will practice for an interview.
Course Outcomes:
* explain surgical anatomy and abnormalities that relate to each type of surgical
procedure
* describe preoperative, intraoperative and postoperative processes as they relate
to each type of surgical procedure
* identify surgical procedures according to specialties including General, Gas-
trointestinal, Obstetrics and Gynecological, Genitourinary, Ear, Nose, Throat,
**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, abnormalities, 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.

Course Outcomes:
- * explain surgical anatomy and abnormalities that relate to each type of surgical procedure
- * describe preoperative, intraoperative and postoperative processes as they relate to each type of surgical procedure
- * identify surgical procedures according to specialties including Oral/Maxillofacial and Plastic/Reconstructive
- * explain diagnostic procedures relating to surgery

Prerequisite(s): SURG1442

(1 C: 1 lect/pres, 0 lab)

**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 first rotation in order to continue on the 2nd rotation.

Course Outcomes:
- * perform pre-operative skills specific to a surgical technologist
- * perform intra-operative skills specific to a surgical technologist
- * evaluate your performance
- * work towards independence
- * assist with support personnel duties
- * exhibit professionalism
- * display dependability
- * meet the “standard” clinical case requirements set forth by the 5th edition of the Core Curriculum. The requirements are as follows: First scrub 125 cases, 35 cases must be solo (90%) as follows: Core: Level I-10, Level II-10; Specialty: Level I-10, Level II-5

Corequisite(s): SURG1442

Prerequisite(s): SURG1424 must be taken in the semester immediately preceding SURG 1462

(14 C: 0 lect/pres, 14 lab)

**SURG 1463 - O.R. Clinical Lab II**

This course will enable students to be a functional member of the surgical team in the capacity of a surgical technologist. During this 3-week rotation, students will become independent practitioners by performing all of the duties of a surgical technologist in the cases they are assigned to scrub. Students will sharpen the skills learned in prior surgical technology theory and lab courses. The students will complete any experience with the central processing, unit support, and instrument room personnel that was not available to them in SURG 1462.

Course Outcomes:
- * perform pre-operative skills specific to a surgical technologist
- * perform intra-operative skills specific to a surgical technologist
- * 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)

**TECH 1500 - Applied Algebra**

This is an introductory algebra course. The course is designed for students who have no previous experience in algebra and for those who need a review of basic algebraic concepts. The primary goals of this course are to help individuals acquire a solid foundation in the basic skills of algebra and to show how algebra can model and solve authentic real-world problems.

Course Outcomes:
- * solve practical problems in all topic areas
- * apply critical thinking skills to solve a variety of problems
- * utilize a systematic approach to problem solving
- * work as a member of a team to achieve a common goal, by showing respect for other peoples needs, ideas, and feelings
- * exhibit professional and responsible behavior by being on time, participating in class discussion, effective utilization of resources and completing assignments on time
- * demonstrate effective use of resources including faculty, other students, reference materials, industry sources, and the Internet

Corequisite(s): SURG1443

Prerequisite(s): SURG1462, SURG1442

(3 C: 0 lect/pres, 3 lab)

**TECH 1519 - 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 who 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 real-world problems. This is a blended on-line course utilizing Tooling “U”, D2L and proctored unit exams.

Course 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

Corequisite(s): TECH1500

(3 C: 3 lect/pres, 0 lab)

**TECH 1522 - Manufacturing Math**

This course will focus on the practical applications of applied geometry and trigonometry. Students will be involved in problem solving as it relates to industrial manufacturing and trade applications.

Course Outcomes:
- * solve practical applied problems in all course content 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 as a member of a team to achieve a common goal, by showing respect for other peoples 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 and industry sources

Prerequisite(s): TECH1500

(4 C: 3 lect/pres, 1 lab)

**PLEASE NOTE:** All program plans are preliminary and curriculum may change without notice.
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.
Course Outcomes:
* create, save, print, edit, format, and enhance word-processing documents, and manage documents on disk
* present, manipulate, and calculate numerical data in columns and rows and enhance spreadsheet presentations with graphics
* create, save, print, edit, format, and enhance graphical presentations
* organize, sort, and manage data, prepare merged letters, envelopes, and mailing labels and create and organize database files
* add visual enhancements to documents and integrate information from multiple applications into one document
* explore the Internet using browser software
* show a portfolio of completed assigned projects
* model professional and responsible behavior by being on time, participating in class discussions and completing assignments on time

(2 C: 0 lect/pres, 1 lab)

TECH 1540 - Technical Communications
Students are introduced to the correct procedures for verbal and written communication in the technical field including and presenting technical data and working in a team environment.
Course Outcomes:
* define and relate technical writing to the expectations of the workplace
* prepare various types of reports
* organize ideas and collect information for the creation of an outline
* prepare or present visual aids
* prepare an informational report
* develop a resume
* cooperate with teammates
* demonstrate the ability to meet time deadlines
Prerequisite(s): TECH1530 or CPR1210
(1 C: 0 lect/pres, 1 lab)

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.
Course 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)

TECH 1556 - Basic Manual - Automated Machining
This course is intended to give the student an introduction into the machining-metallurgical working 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 electronics students. The electronics students will be given a higher level of automated machining experiences than the welding and CADD students.
Course 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)

TECH 1558 - Applied Geometric Dimensioning and Tolerancing
Students will engage in learning how to read prints with Geometric Dimensioning and Tolerancing applications. Each of the geometric controls will be examined so the student may determine the allowable variation in form and size between part features. The Y14.5 M standard will be part of the overall instruction. Using precision equipment most of the geometric controls will be inspected to print specifications.
Course 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
* complete a sketch or print with pertinent feature control frame and its contents

(2 C: 1 lect/pres, 1 lab)

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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)

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.

Course 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

THTR 1360 - Acting for Everyone/Beginning Acting/Acting I
Meets MN Transfer Goal 6 - Humanites 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.

Course 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): READ0304, ENGL0304 or Appropriate Accuplacer Score.
(3 C: 3 lect/pres, 0 lab)

TRAN 1502 - General Service
This course covers the correct procedures for servicing vehicles, shop safety and use of service manuals and bulletins. Automotive tools, equipment and minor service and repairs will be emphasized.

Course Outcomes:
* examine shop safety procedures and incorporate them into work habits
* identify service intervals perform vehicle safety inspections
* perform minor lubrication and tire services
* examine waste handling procedures and comply with EPA and MPCA regulations
* perform minor battery service
* perform cooling system maintenance and minor repairs
* locate service information using service manuals and electronic data handling equipment
* relate the function and operation of basic engine and transmission systems

* perform safe and proper use of basic hand tools

(2 C: 1 lect/pres, 1 lab)

TRAN 1504 - Electricity and Electronic Principles
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.

Course Outcomes:
* examine electrical theory
* work safely with electricity
* relate electricity to the vehicle electrical systems
* use electrical test equipment
* perform a computerized scan analysis
* develop diagnostic trouble finding skills
* develop understanding of the operation of vehicle electrical components and testing procedures

(3 C: 1 lect/pres, 2 lab)

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.

Course 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)

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. Studies include shop safety, haz-mat identification, haz-mat source identification, storage and handling of haz-mat, personal and environmental effects of haz-mat, emergency procedures involving haz-mat, and pollution prevention techniques.

Course Outcomes:
* access and utilize safety and environmental information to improve the workplace and global environments
* recognize their professional obligation to explore and develop pollution preventive maintenance practices

(1 C: 1 lect/pres, 0 lab)

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.

Course 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)

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.

Course Outcomes:

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
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 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.
Course 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
* evaluate various welding processes and applications to your trade

WELD 1505 - Arc Welding Processes I
Students will study the 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.
Course Outcomes:
* demonstrate proper use and inspection of personal protection equipment (PPE)
* demonstrate proper safe operation practices in the work area
* demonstrate proper use and inspection of ventilation equipment
* demonstrate proper Hot Zone operation
* demonstrate proper work actions for working in confined spaces
* demonstrate proper use of precautionary labeling and MSDS information

WELD 1515 - Thermal Welding and Cutting Process
This course covers the use of oxy-fuel equipment welding, cutting, brazing, and the use of the Plasma Arc Cutting (PAC) 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.
Course Outcomes:
* interpret basic elements of a drawing or sketch
* interpret welding symbol information
* prepare an applicable bill of materials
* perform conversions of standard inch and metric measurements
* solve the common welding/fabrication workplace problems involving perim-

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

WELD 1540 - Arc Welding Processes II
Students will study the fundamentals 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-S, GMAW-P, GMAW (spray), FCAW-G/GM, FCAW-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.
Course 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 Gas Metal Arc Welding (GMAW) and Flux Cored Arc Welding (FCAW-G/GM, FCAW-S)
* perform safety inspections of GMAW, FCAW equipment and accessories
* make minor external repairs to GMAW, FCAW equipment and accessories
* operate and set up for GMAW (spray), FCAW-G/GM, FCAW-S operations on carbon steel
* operate and set up for GMAW-S, GMAW-P operations on carbon steel, stainless steel, and aluminum
* pass GMAW (spray), FCAW-G/GM, FCAW-S welder performance qualification test on carbon steel
Prerequisite(s): WELD1505
(6 C: 1 lect/pres, 5 lab)

WELD 1545 - Gas Tungsten Arc Welding
Students will study the 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.
Course 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 Gas Tungsten Arc Welding (GTAW)
* perform safety inspections of GTAW equipment and accessories
* make minor external repairs to GTAW equipment and accessories
* operate and set up for GTAW operations on carbon steel, austenitic stainless steel, and aluminum
* pass GTAW welder performance qualification test on carbon steel, austenitic stainless steel, and aluminum
Prerequisite(s): WELD1505
(4 C: 1 lect/pres, 3 lab)

WELD 1558 - Fabrication, 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.
Course 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)

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.
Course 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)

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.
Course Outcomes:
* identify, distinguish and describe treatment facilities and processes utilized in water and wastewater treatment, including membrane technologies applied to water treatment processes
* identify ground and surface water sources
* identify physical, chemical, biological and radiological characteristics of water and wastewater
* list pollution control standards for potable and treated wastewater, and identify established regulation limits associated with the water standards
* explain the operation and maintenance of collection systems and its components
* discuss and explain the hydrologic cycle
(3 C: 3 lect/pres, 0 lab)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
WETT 1510 - Water/Wastewater Treatment Calibrations
Students will review basic arithmetic and metric conversions. Calculations will relate to water and wastewater treatment using word problems to solve for: volumes, areas, flows and weights.

Course Outcomes:
* solve basic algebraic and geometric calculations related to water industry
* use conversion factors to express answers to problems in proper units
* use a formula sheet to aid in solving problems
(2 C: 2 lect/pres, 0 lab)

WETT 1514 - Source Water Treatment and Development
Students will study the treatment of 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.

Course 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
* understand the hydraulic and horsepower applications of pumps
* understand the importance of meeting well construction codes and preventive maintenance procedures for a public water supply
* explain the process of designing a well head 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)

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 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.

Course 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 floe formation
* understand 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
* demonstrate ability to work, problem solve and communicate, orally and in writing, with others

Prerequisite(s): WETT1506, WETT1510, WETT1502
(3 C: 1 lect/pres, 1 lab)

WETT 1522 - Water Plant Operation II
This course correlates and uses synthesis to assist the student to gain knowledge and experience in advanced raw water and drinking water testing. The tests presented are based on knowledge obtained in previous courses. All sampling and testing are evaluated using Public Health and Environmental Protection Agency Standards.

Course Outcomes:
* understand the chemistry of lime-soda ash softening and relate it to plant operation
* perform jar test along with assigned pre and post analysis on a river water sample. Use results to calculate chemical dosage necessary to soften and remove turbidity from water
* explain the importance of providing a stable water supply from both a health and economic aspect
* discuss the importance and application of the adsorption treatment process
* explain the history of fluoridation; the compounds used and their chemical characteristics; the techniques used to feed and calculate dosages
* demonstrate ability to work, problem solve and communicate, orally and in writing, with others

Prerequisite(s): WETT1518
(3 C: 2 lect/pres, 1 lab)

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.

Course 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)

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.

Course Outcomes:
* investigate the history of OSHA and the reasons for its development
* understand the importance of management and employee involvement in a safety program
* study the primary hazards involved in the water industry
* develop a job hazard analysis presentation
* understand the seven steps of presenting a safety program
* construct and develop a utility safety manual

(3 C: 3 lect/pres, 0 lab)

WETT 1534 - Wastewater Plant Operation I
This course will assist students in understanding preliminary, primary and secondary operation and process control at a wastewater treatment facility. The concept of rotating biological contractors and trickling filter operations and maintenance will be presented as the secondary processes. 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.

Course Outcomes:
* identify, distinguish and differentiate between treatment processes and control techniques for preliminary treatment, primary treatment and secondary treatment within a wastewater treatment facility
* relate control parameters with lab analysis associated with individual treatment processes as well as identify potential hazards in a wastewater treatment facility, lab settings and demonstrate the knowledge and ability to identify and correct unsafe and/or harmful conditions
* identify and classify lift stations and describe their function in a wastewater collection system

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
Calculations of chemical required by these systems will be explored. Disinfection by chlorination will be employed in water and waste collection systems and disinfection methods employed in water and waste treatment facilities. The laboratory component presented in this course will require a synthesis of prior theory and practice.

Course 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
* observe and assist with real-life treatment facility operation and problem solving

* demonstrate ability to cooperate and work with others, troubleshoot systems, problem solve and communicate, orally and in writing

Prerequisite(s): WETT1502, WETT1506, WETT1510
(3 C: 2 lect/pres, 1 lab)

**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.

Course 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
* 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)

**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.

Course Outcomes:
* develop a lab procedure manual containing lab procedures for a wastewater treatment facility
* complete lab analysis (including quality control), develop procedural techniques and relate lab results to wastewater treatment facility operation and control
* calculate loading rates, percentages, and other mathematical computations related to the data developed from lab analysis

* demonstrate ability to interact, collaborate, communicate, listen, assist, communicate orally and in writing

Prerequisite(s): WETT1502, WETT1506, WETT1510
(3 C: 1 lect/pres, 2 lab)

**WETT 1546 - Collection and Disinfection Systems Operation**

This course will prepare students for the operation and maintenance of wastewater collections 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 and the 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.

Course Outcomes:
* identify and distinguish between collection and disinfection systems
* obtain proficiency with analytical methods used for disinfection of waters and wastewater’s
* calculate flows, chemical dosages and feed-rates, percent solutions and other mathematical computations associated with chemical additions
* define methods of lift-station and collection system operation and maintenance

Prerequisite(s): WETT1502, WETT1506, WETT1510
(3 C: 2 lect/pres, 1 lab)

**WETT 1550 - Strategic Enhancement for Success**

This course is designed to synthesize all courses in the Water Environment Technologies program. The process of synthesis will assist students in passing their state “class D” certification examination and to complete an internship in cooperating water and wastewater treatment facilities. Students will also complete the process of researching and applying for employment, using a variety of methods learned in the water and wastewater industry. Use of the D2L online learning environment will be utilized in this class.

Course Outcomes:
* develop and prepare a resume and cover letter
* define and explore sources of employment
* identify job opportunities and submit applications for employment
* conduct interviews and perform self-assessments in relation to employment potential

* solve mathematical problems associated with the operation and control of water and wastewater treatment facilities
* observe and assist with real-life treatment facility operations and problem solving

* complete packets 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)

**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.

Course Outcomes:
* define methods of lift-station and collection system operation and maintenance
* calculate flows, chemical dosages and feed-rates, percent solutions and other mathematical computations associated with chemical additions
* define methods of lift-station and collection system operation and maintenance

* identify and explain the mechanical equipment and uses of the equipment in the chlorine feed system
* demonstrate ability to cooperate and work with others, troubleshoot systems, problem solve and communicate, orally and in writing

Prerequisite(s): WETT1502, WETT1506, WETT1510
(3 C: 1 lect/pres, 2 lab)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
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 operator’s license upon meeting the state and federal requirements for biosolids application.

Course Outcomes:
* Identify and describe the main subparts of CFR part 503
* Identify the requirements for biosolids classification
* Complete necessary forms and reports required by regulatory agencies
* Calculate biosolids loading and application rates and other mathematical computations associated with operation and control of biosolids
* Identify and explain the importance of management practices and record keeping
* Describe potential violations and penalties
* Observe and/or assist with the application of biosolids to a land application site

Prerequisite(s): WETT1502, WETT1506, WETT1510
(3 C: 3 lect/pres, 0 lab)

WETT 1562 - Backflow Prevention and Control
This course will train the small water system operator to identify areas where backflow prevention is required. The course will also include what the different types of backflow devices are available and the proper application of such devices. Operators will also learn about the potential health concerns related to cross connections and understand the terminology of this subject.

Course Outcomes:
* Distinguish between the various types of backflow prevention devices
* Apply backflow prevention devices in proper applications
* Differentiate between backflow and back-siphonage
* Describe and identify cross connections in a public water supply
* Identify the public health concerns associated with cross connections

(1 C: 1 lect/pres, 0 lab)

WETT 1564 - Applying Water Operator Math Skills
This course is designed to train the small water system operator the basic math skills in order to properly operate and maintain a public water system. Procedures that will be covered will include area volume, quantity and velocity calculations, chemical additions and dosage calculations. Formula selection and calculator usage will also be included.

Course Outcomes:
* Manipulate basic mathematical formulas required by small system operators
* Troubleshoot results of water treatment processes based on results of calculations
* Demonstrate mastery with use of calculators
* Demonstrate ability to assist others with interpretation of data from calculations
* Demonstrate ability to select proper formulas associated with desired information

(1 C: 1 lect/pres, 0 lab)

WETT 1566 - Disinfection II, Gas Chlorinators
In this course small system operators will learn the purpose of disinfection processes. Topics that will be covered in this class will include: chemistry of chlorination, chlorine safety requirements, and calculations of dosage. The focus of this course will be on gas chlorination and chlorinators. Students will be required to identify, repair and maintain all components in a gas chlorination system and to recognize associated problems with a failed or failing system. Also, students are expected to learn the standards set forth by the AWWA for materials, installation and application of chlorine facilities.

Course Outcomes:
* Apply the A and B repair kits to 150 pound 1 ton Chlorine containers
* Describe breakpoint chlorination
* Provide routine maintenance for a chlorine system
* Disassemble and reassemble parts of the chlorine system to include the regulator, ejector, rotometer and other feed system components
* Calculate the dose, demand and residual required in a public water system
* Identify safety issues associated with handling and feeding chlorine

(1 C: 1 lect/pres, 0 lab)

WETT 1569 - Fire Hydrants and Water Meters
In this course small water system operators will learn to effectively operate and maintain fire hydrants and water meters. Areas to be included in this course will include, proper hydrant flushing techniques, hydrant maintenance, code requirements, differentiating between hydrant types and evaluation of hydrant conditions. Other subject areas will include planning and inspection of construction projects, winter operation and readiness, and pumping of wet barrel hydrants. Water meter component will include disassembly and reassembly of residential and compound water meters, identification of meter parts and common failures of water meters. Students are expected to distinguish between several types and models of water meters and associated components. Students will study how a meter register works and explain the concept behind magnetic metering. Remote meter reading applications will be explored.

Course Outcomes:
* Demonstrate ability to repair a fire hydrant
* Demonstrate ability to repair water meters
* Distinguish between different types of water meters and fire hydrants and where and how they are used
* Identify and describe proper procedures for opening and closing fire hydrants
* Identify procedures used to secure water meters and identify tampering of metered water supplies
* Demonstrate how to flow test a hydrant
* Explain the color coding of fire hydrants in relation to water flow
* Demonstrate the ability to read a water meter register and convert from cubic feet to gallons

(1 C: 1 lect/pres, 0 lab)

WETT 1570 - Fluoridation
This course is designed for small system operators enabling them to understand the purpose, the methods, the maintenance, and the monitoring required to operate a fluoride feed system. The course covers a brief history of fluoridation. Techniques that can be used for system setup and calibration. Calculations required to dilute liquid fluoride. MDH reporting requirements to include process and frequency of reports. Operation and maintenance of chemical feed pumps will be included. Module will also include methods available to analyze fluoride concentrations in public water supplies.

Course Outcomes:
* Explain the function and purpose of a fluoride break box
* Install a fluoride feed line into a water main
* Calculate a fluoride feed rate based on desired concentrations in a water system
* Operate a fluoride system
* Identify the hazards associated with fluoride acid
* Identify limitations for fluoride in a system and associated health affects

(1 C: 1 lect/pres, 0 lab)

WETT 1573 - Water Testing for Small Systems
This course will train the small water system operator on how to use laboratory analysis to assist in the operation of a water utility. Operators will learn the proper techniques required to perform water analysis and to apply the results to day-to-day operations. The course is designed to provide the operators with adequate time to develop and perfect the skills to obtain useful data. Procedures that will be covered will include but are not limited to total and fecal coliform analysis, pH, iron and manganese, water hardness, and fluoride concentrations.

Course Outcomes:
* Perform lab tests to industry standards
* Demonstrate proper technique in use of lab equipment
* Identify and choose proper equipment for laboratory tasks
* Provide assistance and work with team members as a cohesive unit
* Demonstrate ability to locate necessary resources
* Troubleshoot associated problems and conflicts within a test procedure

(1 C: 1 lect/pres, 0 lab)

PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
WETT 1574 - Ion Exchange/Reverse Osmosis
In this course the operator will gain knowledge and understanding in the opera-
tion of ion exchange and reverse osmosis water treatment systems. Operators
will practice operating and maintaining treatment units in order to provide both
safe and aesthetically desirable drinking water supplies.
Course Outcomes:  
* explain theory of operation for ion exchange and RO units  
* identify phases of unit operation  
* perform basic maintenance activities  
* complete troubleshooting analysis  
(1 C: 1 lect/pres, 0 lab)

WETT 1577 - Disinfection I, Hypochlorinators
This course is designed to provide small water system operators with the knowl-
dge and skills required to operate water facilities chlorination systems using
liquid solutions as hypochlorite. The content will include preparation of various
strength chlorine solutions, feed equipment and processes used in the hypochlo-
rite feed system, application and monitoring points and proper installation of such
facilities. Safe handling and personal protection equipment when dealing with
hypochlorite solutions will be emphasized. Disinfection analysis and calculations
of dosages are also likely. Other small systems disinfection methodologies may
be incorporated into this course to meet the needs of communities in rural areas.
Course Outcomes:  
* prepare a hypochlorite solution to a predetermined strength  
* identify and assemble a hypochlorinator system including the pump feed system  
* analyze Chlorine residual  
* troubleshoot a problem(s) related to a chlorine feed system  
* perform calculations related to chemical feed for various strength solutions  
* recognize safety issues associated with handling of chlorine chemicals  
(1 C: 1 lect/pres, 0 lab)

WETT 1580 - Water Communications Network
The purpose of this course is to provide small water system operators with the
knowledge and skills required to develop and maintain a functional record
keeping and reporting system. Primary areas of coverage will include records
and reports that are required by the MN Department of Health. Information will
also be provided on documentation requirements of EPA and the Safe Drink-
ing Water Act regulations. The course will include the operation and
maintaining the public water system in their charge to include items such as routine and preventative
maintenance. This course will provide assistance with report writing to enhance
the communications process.
Course Outcomes:  
* develop spreadsheets necessary for water facility operations  
* complete standard Minnesota Department of Health forms  
* identify need(s) for records and record keeping  
(1 C: 1 lect/pres, 0 lab)

WETT 1582 - Water System Corrosion Control
This course is designed to train the small water system operator on the impor-
tance of corrosion control in water treatment facilities and distribution systems.
Key topics that will be covered and discussed are, use of chemicals, chemical
application points, and chemical feed systems. One of the objectives is to be able
to identify and recognize a systems need to manage corrosion of the system and
recognize the steps to prevent excessive corrosion form occurring.
Course Outcomes:  
* identify corrosion and its effects in a water system  
* demonstrate ability to formulate solutions to colored water problems  
* understand methodologies available to small water system suppliers for managing
  corrosion in a water system  
* demonstrate the use of chemicals for corrosion control  
* identify causes of aggressive waters  
* distinguish between corrosion and scale formation  
(1 C: 1 lect/pres, 0 lab)

 PLEASE NOTE: All program plans are preliminary and curriculum may change without notice.
laboratory setting using system simulations.

Course Outcomes:
* develop skills relating to operation and maintenance of centrifugal pumps
* identify applications for the use of various types of pumps
* repack a pump packing gland and fit a pump with a mechanical seal
* size pumps for proper system size
* demonstrate ability to apply pump curves to pump operation
* determine head conditions for pump applications
* identify cavitation in centrifugal pumps and demonstrate how to correct problems
(1 C: 1 lect/pres, 0 lab)

WETT 1592 - Water Filtration
This course is designed to train small water system operators to understand the theory and design of water filtration. Information will be presented on both gravity and pressure filtration systems. Topics will include determining when and how to backwash, what parameters to monitor and how they can be implemented into filter operation. The course will also include information on aeration and chemical additions used with filtration systems.

Course Outcomes:
* demonstrate ability to backwash filters
* differentiate and describe methods of filtration
* establish guidelines/parameters for filter wash cycles
* identify treatment methods incorporated with filtration of water
(1 C: 1 lect/pres, 0 lab)

WETT 1594 - Water Exam Preparation
This course is designed to assist operators in preparing for State of Minnesota licensure (upper level). Students will be supplied with materials necessary to study and practice for their exams. Content for each licensure level will be provided. This course will provide training with math skills, Regulations, maintenance, process control and operation knowledge as well as distribution system components and other pertinent components in water treatment systems. Students will be required to complete a variety of tests addressing content covered in the course and reference materials. Materials and tests will be provided in electronic and manual/paper formats.

Course Outcomes:
* identify various contaminants and their minimum set-back distances
* complete written tests and worksheets
* interpret/understand the rules and regulations of the SDWA to a level expected for individual licensure classifications
* compute mathematical calculations as they apply to the water industry
* identify and distinguish between primary and secondary standards
(1 C: 1 lect/pres, 0 lab)

WETT 1596 - Iron and Manganese Treatment Techniques
This course is designed to train small water system operators to understand the sources of iron and manganese in drinking water supplies. Information will be presented on treatment techniques, test methods, impacts on and with-in treatment systems as well as chemical and physical processes utilized for removal. Students will review and discuss the effects of iron and manganese on the customers and heating systems throughout their service area. Critical evaluation of the secondary maximum contaminant levels will be explored. The course will also include exploration of aeration systems and chemical addition used in conjunction with filtration systems for the removal of iron and manganese.

Course Outcomes:
* demonstrate ability to differentiate, visually, the effects of iron and manganese in a public water supply
* differentiate and describe methods of physical treatment
* identify and demonstrate chemicals and chemical addition methods for the removal of iron and manganese
* perform mathematical calculations to establish solution strength and dosage requirements to water supplies
* identify potential impacts of iron and manganese in water supplies
(1 C: 1 lect/pres, 0 lab)

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Academic Advisor
An academic advisor is a faculty member assigned to advise a student and act as a resource.

Academic Forgiveness
Some colleges or universities offer students an opportunity to disregard grades that they obtained in the past according to specific guidelines. The policy only applies to the institution where it is granted and does not apply to financial aid eligibility. Previous credits and grades that a student has earned are ignored in the calculation. The courses, however, remain on the transcript.

Admissions and Counseling
The Office of Admissions provides assistance in the enrollment process. Counseling is provided by trained professionals that adhere to the “Ethical Standards for School Counselors.” Counselors facilitate academic, career, and personal student success.

Advanced Placement (AP)
Courses offered in high school and exams that cover the material taught in AP courses. Students who pass the AP exam with a minimum score can have credit awarded at colleges and universities according to institutional policies.

Alumnus/Alumni
A person or persons who attended or graduated from a particular school.

Articulated College Credit (Tech Prep)
A program designed to provide the competencies high school students need to move into technical programs that transfer to the technical college for advanced placement. Classes in which material is learned in an active or applied manner, usually in high school.

Assessment
Assessment is a way of evaluating students’ present skills, such as in English, reading and math so students are placed into appropriate level courses. Assessment is based on placement scores that are used as a guide for proper course placement to maximize student success.

Associate in Arts (AA)
An Associate in Arts degree may be awarded after the successful completion of a liberal arts and sciences curriculum designed to constitute the first two years of a baccalaureate degree. An Associate in Arts degree shall include the entire Minnesota Transfer Curriculum.

Associate in Applied Science (AAS)
An Associate in Applied Science degree may be awarded for successful completion of a program of 60 to 72 semester credits. An AAS degree may be designed to transfer to a related baccalaureate major. The degree shall include a minimum of 25 percent of the total credits in general education, from at least 3 goal areas.

Associate in Science (AS)
An Associate in Science degree may be awarded after the successful completion of a program in a designated field or area which transfers to a baccalaureate major in a related scientific, technical, or non-liberal arts professional field. The degree shall include a minimum of 30 semester credits in general education credits, from at least 6 goal areas.

Audit
Students participate in a course but are not required to take exams or quizzes, or complete assignments. Students do not receive grades or credit for audited courses. Students pay to attend the class and registration for audit requires the permission of the instructor.

Bachelor’s Degree
A degree awarded by a state college or university after the successful completion of a program of 120 to 128 semester credits.

Catalog
A book containing course descriptions, program and general education requirements, college policies, procedures and standards, and student rights and responsibilities. Catalogs may be available online.

Certificate
A certificate may be awarded after the successful completion of a specialized program of study. A certificate shall include 9 to 30 semester credits.

Class Schedule
A listing of all classes that will be offered during a semester, including days and times of class meetings, names of instructors or to be announced (TBA), rooms, registration information, academic policies, support services, etc. Not all courses are taught each term. Class schedules may be available online.

CLEP
The College-Level Examination Program or CLEP provides students of any age with the opportunity to demonstrate college-level achievement through a program of exams in undergraduate college courses.

College Readiness Courses
Courses that prepare students to succeed at the college level. These credits do not count toward graduation.
**Concurrent Registration**
Registration in two classes at the same time.

**Core Studies**
Courses that count toward graduation in more than one related program and contain content common to two or more majors.

**Counselor**
A professionally trained staff member who helps students with education, career, and/or personal concerns. Counselors may also teach career or personal enrichment classes.

**Credit**
The value assigned to a course. Usually one credit equals one 50-minute class period per week. A course that is assigned 3 credits would meet for three 50-minute periods per week.

**Credit by Exam**
An examination designed to demonstrate knowledge in a subject where the learning was acquired outside the classroom.

**Credit for Prior Learning**
Credit awarded to a student who demonstrates knowledge and/or proficiency in a subject through an exam or evaluation of a portfolio.

**Curriculum**
The content and competency level of each credit course as approved by the Academic Affairs and Standards Council led by faculty members.

**Dean**
The highest officer of an academic division of study.

**Degree**
An award given to students that have successfully completed a specified number of collegiate level credit courses and experiences.

**Degree Audit Reporting System (DARS)**
Allows electronic evaluation of a student’s academic record toward their academic goal. A student or advisor can use a DARS report to know what requirements remain to be completed.

**Department**
The organizational unit established by the College. For example, Transportation Technology.

**Diploma**
A diploma may be awarded after the successful completion of a program intended to provide students with employment skills. A diploma shall include 30 to 72 semester credits. At least one-third of the credits shall be taught by the faculty recommending the awarding of the diploma.

**Drop**
Students are allowed to drop (cancel) courses without penalty during the first five days of the semester. Financial aid benefits may also be curtailed because a course is dropped. A drop is not recorded on the student’s transcript and there is a refund for the course.

**Electives**
Courses students select from an academic area. The number of electives varies according to programs. Electives may be suggested by program advisors.

**Extracurricular**
Activities, clubs, or organizations students join and participate in above and beyond academic courses.

**Faculty**
Instructors employed by the College who meet the standards and requirements for employment.

**Fees**
Money charged by a college (in addition to tuition) for services or equipment provided to a student. Fees may be charged for health services, athletic centers, registration, parking, lab equipment, computers, etc.

**Final Exams**
Exams held during examination week at the end of each semester. Instructors may also schedule periodic exams or mid-term exams throughout the semester.

**Financial Aid**
Federal, state, college, and private programs help students pay for college costs. Financial aid can be in the form of grants, loans, or college work-study programs. Grants are often described as “free money” and are awarded to students by the state and federal governments based on criteria that must be met.

**Full-time Student**
Students are considered full-time if enrolled for a minimum of 12 credits per semester.

**General Education**
Courses that are outside a field of study that may be part of the Minnesota Transfer Curriculum. Students must complete a minimum of 15 semester credits in general education to satisfy the requirements for the Associate in Applied Science Degree.

**General Studies**
Semester credits (6-9) outside a field of study offered at a technical college to meet the requirements for the Diploma of Occupational Proficiency. General Studies courses do not fulfill the Minnesota Transfer Curriculum.
GPA Values
Values given to letter grades so that grade point averages may be computed. The following values are used at St. Cloud Technical College: “A”, 4.0; “B”, 3.0; “C”, 2.0; “D”, 1.0; and “F”, 0.0.

Grade Point Average (GPA)
An arithmetic mean of grade points earned ranging from 0.0 to 4.0.

Hour
A unit of time measurement defined as 50 minutes that designates the time spent in classroom or laboratory for a course.

Incomplete Grade
A grade given when student performance dictates success in the course, but all course requirements are not completed. Needs faculty approval. An incomplete grade is changed to “F” when the assignments are not completed within the specified time.

Internship
Class credit given to students who work at jobs on or off campus. The jobs give them practical experience in their major. Internships may or may not be paid.

Lecture
A common method of instruction in college courses, when a faculty member conveys information by speaking to a class.

Letter Grades
A grade such as “A”, “B”, “C” that designates the quality of work. Letter grades have the following meanings: “A”, superior; “B” very good; “C”, average; “D”, passing; “F”, failing; “P”, pass, but no grade points; “AU”, audit for no credit or grade; (NC) failing.

MnSCU
The Minnesota State Colleges and Universities system comprises 32 colleges and universities, including 25 two-year colleges and seven state universities. The system is separate from the University of Minnesota.

Matriculate
To apply for a degree program, to be accepted in that program, and to enroll in classes.

Official Transcript
An official transcript is the only document receiving institutions will accept to determine transfer of courses. The transcript must be sent directly from one institution to another or may be in a sealed envelope. If the envelope is opened, the transcript becomes unofficial.

Orientation
A period of time or a series of events planned to help new students adjust satisfactorily to college life.

Part-time Student
A student enrolled for fewer than 12 credits per semester.

Prerequisite
A requirement of a specific course that must be completed before the course can be taken. Minimum requirements for enrolling in a course.

President
The chief administrative officer appointed by the Chancellor of the Minnesota State Colleges and Universities system to be responsible for the management and day-to-day operations of the college in accordance with policies set forth by the Board of Trustees and in compliance with Minnesota state law governing higher education.

Probation
Notice that a student is not making satisfactory academic progress. Without improvement probation is followed by suspension.

Progress Report
A report issued to students mid-semester to inform them of their academic standing and need for improvement.

Registrar
The registrar manages course schedules and is responsible for maintaining course registration software, the student database and academic records and transcripts.

Registration
Actual enrollment of a student into specific courses after student has been admitted to the college.

Section
A number given to each class offered in a single subject matter.

Semester
A system dividing the academic year into two parts of approximately 16 week segments.

Student ID
Card issued to identify a student. The student ID number is typically used for access to registration and student records.

Supervised Occupational Experience (SOE)
Work experience that students may or may not be paid for to perform work for an employer that is related to their field of study. Faculty supervise these experiences.
**Syllabus**
A course syllabus is a document that contains the elements of the corresponding course outline and standards for evaluation of student learning and will contain additional information which reflects the creative work of the faculty member. Each student enrolled in a course shall receive a course syllabus.

**Technical Studies**
Technical courses that contain specialized program content necessary to become competent in a technical field.

**Term**
A period of study in a college that usually ends with the administration of final examinations. A term may be a semester or summer session.

**Textbook**
A book that summarizes information about the subject matter of a college course.

**Transcript**
A list of all the courses/credits a student has taken with the grades that the student earned in each course. A college or university will often require a high school transcript when a student applies for admission.

**Transfer Credit**
Course credit that is accepted from or by another college or university to meet program requirements.

**Tuition**
The amount charged per credit for college courses.

**Tutor**
A person who gives individual instruction to students, either in or outside the classroom.

**Withdrawal**
The procedure in which a student officially removes himself/herself from taking a class, or from an institution. Tuition may or may not be refunded, depending on the date of withdrawal or other extenuating factors. Students withdrawing from one or more courses must notify the college or university in writing and request that they be officially withdrawn. Refunds, if any, are based on the refund schedule set forth in the catalog.

**Withdrawal Grade (W)**
A grade given so that students may drop courses when they have good reasons for doing so. “W” grades do not lower grade point averages.