Hennepin Technical College

College Catalog

2004/2005

Construction & Building

Floral & Landscape

Media Communications

Service

Business & Computers

Health

Manufacturing & Electronics

Transportation

HennepinTechnical College

www.hennepintech.edu

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Bookstore	(763) 488-2665	(952) 995-1529
Campus Switchboard	(952) 995-1300	(952) 995-1300
Counseling Appointments	(763) 488-2547	(952) 995-1451
General Program Information/ Campus and Program Tours	(763) 488-2450	(952) 995-1452
Tuition Office	(763) 488-2496	(952) 995-1466
Registration	(763) 488-2580	(952) 995-1460
Disability Services Coordinator	Sara Laviolette (763) 488-2477	John Heinrichs (952) 995-1544
Financial Aid	Margo McGeary (763) 488-2491	Kendra Schulte (952) 995-1471
Job Placement	Cheryl Benkofske (763) 488-2411	Cheryl Benkofske (763) 488-2411
Transfer Specialist	Carmella Gaynor (952) 995-1455	Carmella Gaynor (952) 995-1455
Multicultural Advisor	Kara Fox (952) 995-1440	Kara Fox (952) 995-1440

ADDITIONAL SITES

Bloomington Workforce Center	(952) 346-4000
Customized Training Services	(763) 550-7159
Hopkins Tech Center	(952) 995-1330

Phone numbers subject to change.

www.hennepintech.edu

HennepinTechnical College

Welcome

To Hennepin Technical College

I am pleased to have the opportunity to welcome you as a student to Hennepin Technical College. Whether you are enrolling for the first time or returning to complete your program of study, you are an important member of the college community. It is our goal that your experience here will exceed your expectations. The faculty, staff, and administration are here to make sure that you are given every opportunity and the support you need to achieve your educational goals.

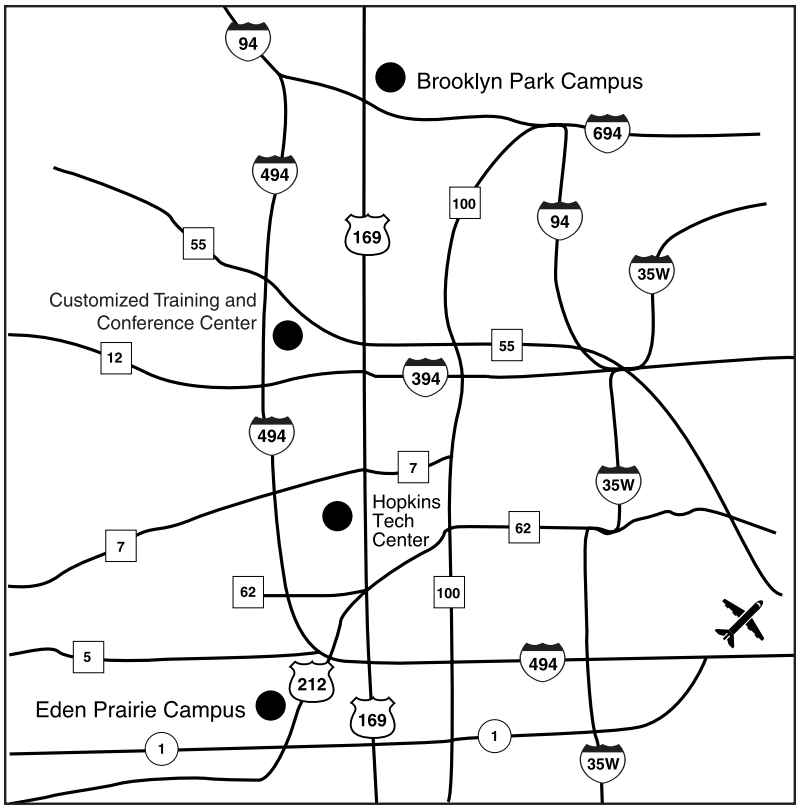
Faculty are experienced in the classroom as well as in their industries. One of the key requirements for instructors at Hennepin Technical College is that they have strong, relevant industry experience. This is extremely important in today's ever-changing and demanding workplace. Your preparation must be closely aligned with the needs of business and industry. To assist faculty with staying current with their industry, they work with industry advisory committees that are responsible for reviewing curriculum to ensure that it is up to date.

Student support staff are available to help meet your needs in the classroom as well as beyond the classroom. Services are available for all students. If you are having difficulty with your coursework, with meeting the financial requirements to stay in school, or are having personal difficulties, please don't hesitate to talk to your counselor or instructor who can assist you or refer you to the appropriate service on campus.

If there is anything I can do to help you be successful, feel free to contact me.
We look forward to continuing to serve your lifelong learning needs at Hennepin Technical College.

Sharon K. Grossbach, Ed.D.
President

Convenient Locations



BROOKLYN PARK CAMPUS
9000 Brooklyn Boulevard
Brooklyn Park, MN 55445
(952) 995-1300

From North or South 169:
Exit onto Brooklyn Blvd. (77th Avenue) and turn east to Brooklyn Park Campus.

From East or West on 694:
Exit onto Highway 169 North. Proceed to Brooklyn Blvd. (77th Avenue). Turn east to Brooklyn Park Campus.

CUSTOMIZED TRAINING AND CONFERENCE CENTER
1820 Xenium Lane North
Plymouth, MN 55441
(763) 550-7159

From North or South:
Exit from 494 on to Hwy 55 East, turn right onto Xenium Lane. Turn left onto Watertower Circle.

EDEN PRAIRIE CAMPUS
13100 College View Drive
Eden Prairie, MN 55347
(952) 995-1300

From 494 South:
Exit from 494 at Valley View Road. At the top of the ramp, go left. Follow Valley View Road to Highway 212 West. Proceed south on Highway 212 West approximately 2.5 miles. Turn right at College View Drive proceed to Eden Prairie Campus.

From 494 West:
Exit from 494 at Highway 212 West. Proceed south on Highway 212 West approximately 2 miles. Turn right at College View Drive proceed to Eden Prairie Campus.

HOPKINS TECH CENTER
11187 Excelsior Boulevard
Hopkins, MN 55343
(952) 995-1330

From North or South 169:
Exit on Excelsior Blvd. and go west approximately 1 mile. Take first left into driveway before 17th Ave. intersection. Entrance is on west side of building.

Contents

Due to changes in conditions beyond the control of Hennepin Technical College, it may be necessary to modify, amend, and/or delete statements appearing in this document without notice. Hennepin Technical College reserves the right to modify any statement herein accordance with current conditions. Information presented in this publication should not be considered as an irrevocable contract.

College Calendar

Semester start dates, end dates, breaks and holidays are established each year as a part of the school calendar .

2004

AUGUST	23	**Fall Semester Begins**
SEPTEMBER	6	No Classes (Labor Day Holiday)
OCTOBER	21-22	No Classes (Education MN Days)
	24-27	No Classes (Thanksgiving Holiday)
DECEMBER	22	**Fall Semester Ends**
	23-31	No Classes (Semester Break)

2005

JANUARY	1-9	No Classes (Semester Break)
	10	**Spring Semester Begins**
	17	No Classes (Martin Luther King Jr. Holiday)
FEBRUARY	21	No Classes (Presidents' Day Holiday)
	22	No Classes (Workshop Day)
MARCH	14-19	No Classes (Spring Break)
MAY	17	**Spring Semester Ends**
	23	**Summer Semester Begins**
	30	No Classes (Memorial Day Holiday)

The dates listed may change. Visit the college website for up-to-date information.

Programs

Business & Computer Careers

Accounting Careers
* Broadband Installation Technician
Computer Careers
Medical Office Careers
Residential Property Management
Web Programmer

Construction and Building Careers

Architectural Drafting
Cabinetmaking
Carpentry
Gas Utility Technology
Heating, Ventilation, Air Conditioning and Refrigeration
Industrial Building Engineering and Maintenance

Floral & Landscape Careers

Landscape Careers
Floral (Retail)

Health Careers

Dental Careers
Emergency Medical Services
Health Unit Coordinator
Nursing Assistant
Practical Nursing

Manufacturing & Electronic Careers

Automated Machinery Systems: Packaging
Electronics Technology
Engineering CAD Technology
Fluid Power Technician
Industrial Building Engineering and Maintenance
Machine Tool Technology
Manufacturing Engineering Technology
Plastics Manufacturing Technology
Welding and Metal Fabrication

Media Communication Careers

Audio Recording
* Broadband Installation Technician
Graphic Design
MultiMedia/Video Design and Production
Printing & Prepress Technology
Professional Photography

Service Careers

Child Development Careers
Culinary Arts
Emergency Management
Environmental Health and Safety
Fire Protection

Transportation Careers

Auto Body Collision Technology
Automotive Mechanics Technology
Ford Automotive Student Service Educational Training Program (ASSET)
Marine/Motor Sports Technology
Medium/Heavy Truck Technology

** Pending approval from the Minnesota State Colleges and Universities System.*

General Information

Mission

Hennepin Technical College's mission is to provide quality technical education needed for employment in an ever-changing global work environment.

Purpose

The College seeks to implement its mission by providing:

- A safe, accessible, and effective teaching and learning environment that supports sensitivity to diverse individuals and groups.
- Individual courses and course sequences that lead to A.A.S. degrees, diplomas, and certificates, which provide learners the opportunity to maximize their potential through the lifelong learning process.
- Developmental, general education, and technical career education curricula designed to prepare learners for employment in an ever-changing workplace.
- A comprehensive array of student support services and financial assistance.
- Opportunities for students to develop leadership skills through participation in student and professional organizations.
- Positive working relationships with business, industry, and other agencies to ensure that programs and equipment are relevant to emerging technology and occupational innovation.
- Flexible and responsive Customized Training Services to meet the specific needs and expectations of business, industry, and the community.
- Leadership roles that foster professional growth and promotion for a diverse, qualified staff.
- Intercollegiate relationships and cooperative agreements which increase opportunities and maximize resources.
- Organizational structures, that support communication, shared decision making, and quality programs and services.

– The Staff of Hennepin Technical College, an Institution of Higher Education

Learner Outcomes

Technical College Learner Outcomes

- Take pride in work
- Learn to manage change while balancing work and other areas of life
- Use technology competently
- Recognize and value others
- Think critically and analytically
- Communicate effectively
- Practice quality improvement concepts
- Exhibit personal, professional and academic ethics
- Develop community and global awareness
- Develop an environmental awareness and appreciation

Accreditation

Hennepin Technical College is accredited by the Higher Learning Commission (HLC) and is a member of the North Central Association. The HLC's web site is **www.ncahigherlearningcommission.org.** HLC may be reached at (312) 263-0456.

Diversity

Hennepin Technical College recognizes, respects, and honors diversity existing in society due to an individual's culture, race, ethnicity, religion, gender, and mental and physical challenges. The college is committed to creating a curriculum and a learning environment that empowers students to become contributing members of an increasingly multicultural and diverse society. Students are encouraged to explore and to be exposed to diverse cultures and perspectives as an important aspect of their learning experience.

Equal Opportunity

Hennepin Technical College provides equal access for all students to classes, programs, activities, and facilities without regard to race, color, creed, religion, gender, national origin, sexual orientation, marital status, age, disability, political affiliation/belief, status with regard to public assistance, or inclusion in any other group or class against which discrimination is prohibited by local, state, or federal statutes and regulations.

Nondiscrimination in Education and Employment

Hennepin Technical College is committed to a policy of nondiscrimination in education and employment opportunity. No person shall be discriminated against in the terms and conditions of employment, personnel practices, or access to and participation in programs, services, and activities.

Harassment of an individual or group on the basis of race, sex, color, creed, religion, age, national origin, disability, marital status, status with regard to public assistance, sexual orientation, or membership or activity in a local commission has no place in a learning or work environment and is prohibited. Sexual violence has no place in a learning or work environment. HTC shall work to eliminate violence in all its forms. Physical contact by designated college staff members may be appropriate if necessary to avoid physical harm to persons or property.

This policy is directed at verbal and physical conduct that constitutes discrimination/ harassment under state and federal law and is not directed at the content of speech. In cases in which verbal statements and other forms of expression are involved, HTC will give due consideration to an individual's constitutionally protected right to free speech and academic freedom. Please refer to the "Nondiscrimination in Education and Employment Opportunity" and "Report/Complaint of Discrimination/Harassment Investigation and Resolution" on the HTC website at www.hennepintech.edu Hennepin Technical College's designated officer, Sharon Mohr, Human Resources Director, can be contacted at (763) 488-2525. Her main office is located at the Brooklyn Park Campus in room C124. Hennepin Technical College is committed to a policy of nondiscrimination in education and employment opportunity. No person shall be discriminated against in the terms and conditions of employment, personnel practices, or access to and participation in programs, services, and activities.

Report/Complaint of Discrimination/ Harassment Investigation and Resolution

This procedure is designed to further implement Minnesota State Colleges and Universities policies relating to non-discrimination by providing a process through which individuals alleging violation of system non-discrimination policies may pursue a complaint. This includes allegations of discrimination or harassment based on sex, race, age, disability, color, creed, national origin, religion, sexual orientation, marital status, status with regard to public assistance or membership or activity in a local commission. This procedure is not applicable to allegations of sexual violence, which should be handled under appropriate system and college or university policies and procedures.

This procedure shall apply to all individuals affiliated with Minnesota State Colleges and Universities, including its students, employees, and applicants for employment, and is intended to protect the rights and privacy of both the complainant and respondent and other involved individuals, as well as to prevent retaliation/reprisal. Individuals who violate this procedure shall be subject to disciplinary or other corrective action.

Not every act that may be offensive to an individual or group constitutes discrimination or harassment. In determining whether discrimination or harassment has occurred, the totality of the circumstances surrounding the incident must be carefully reviewed and due consideration must be given to the protection of individual rights, freedom of speech, academic freedom, and advocacy.

The system office, colleges, and universities shall maintain and encourage full freedom, within the law, of expression, inquiry, teaching, and research. Academic freedom comes with a responsibility that all members of our education community benefit from it without intimidation, exploitation, or coercion. Discrimination and harassment are not within the protections of academic freedom.

Please refer to the "Report/Complaint of Discrimination/Harassment Investigation and Resolution" on the HTC website at www.hennepintech.edu. Hennepin Technical College's designated officer, Sharon Mohr, Human Resources Director, can be contacted at (763) 488-2525. Her main office is located at the Brooklyn Park Campus in room C124.

Accessibility

Hennepin Technical College complies with the Americans with Disabilities Act and the Minnesota Law for Students with Disabilities, which provides for reasonable accommodations for students with disabilities. Persons needing accommodations should contact the Disability Services Coordinator on either campus. Upon request, this information will be made available in an alternative format. To contact the college by TTY, call (763) 488-2571

Drug Free College

The Drug Free Schools and Communities Act Amendment of 1989 (Public Law 101-266) requires colleges and universities to provide information to students and employees to prevent drug and alcohol abuse. Hennepin Technical College recognizes the negative implication of alcohol and other drug health issues and problems. HTC strives to educate students and employees to the dangers of alcohol and drug abuse.

HTC prohibits the use, manufacture, sale, distribution, exchange, or possession of alcohol or controlled substances by any student or employee while on campus or while involved in any college activity, service, and program or work situation.

Sanctions

Administrative and legal sanctions, up to and including, expulsion and referral for prosecution will be imposed on students who violate the preceding standards of conduct.

Administrative and legal sanctions, consistent with existing contracts, up to and including termination of employment and referral for prosecution will be imposed on employees who violate these standards. A disciplinary sanction may include the completion of an appropriate rehabilitation program.

Prevention and Information

Primary prevention efforts will be to provide students and employees with appropriate information to make responsible decisions regarding alcohol and drug abuse.

Some of these efforts are as follows:

- Early identification and intervention efforts to provide assistance to those primary areas of concern.
- Crisis intervention procedures for those experiencing medical emergencies.
- Counseling and referral for those persons with a need for such services.
- Re-entry assistance for those students and employees who complete therapy for drug and alcohol abuse.
- Providing information regarding the college's policies as they pertain to standards of conduct and sanction.

The college will cooperate fully with law enforcement officials in the event of violations of local, state, or federal statutes.

Your Information on the Web

As a student at Hennepin Technical College, you now have the ability to access the following using your Student ID Number and HTC Pin Number

- Register for classes
- View your grades for specific terms
- View your complete HTC academic records
- View the status of your Financial Aid
- View your Financial Aid Award Letter showing the awards you have been offered
- View your HTC account, showing your charges and any balance due
- Pay your HTC account using a credit card
- Change your permanent address

To Access Your Information

1. Visit the HTC web site at: www.hennepintech.edu
2. Select Student Information.
   Click Online Self- Service
3. At the Login screen, enter your Student ID Number and PIN. Then click on Login Now.
4. At the Welcome screen, click the Student tab at the top.
5. There will be a listing of the services available to you. Click on the service you are interested in.

Online Bookstore

Order your textbooks on line (and have them shipped right to your door). There are two ways to access the online bookstore:

1. Visit the HTC Bookstore website at www.bookstore.hennepintech.edu
2. Visit the HTC website at: www.hennepintech.edu
   Select "Student Information" and click on "HTC Bookstore."

Admissions

Admissions Process

Students planning to enroll must complete a Hennepin Technical College application and submit it and the $20 application fee to the Admissions Office. Application forms may be obtained from a high school counselor, from any Minnesota State Colleges and Universities (MnSCU) campus, from HTC, or from the HTC website.

HTC seeks to promote student success by scheduling new students to spend time on campus before registering for classes. During this time, plan to:

- Tour Hennepin Technical College facilities.
- Complete placement testing in the areas of writing, reading, and math; a keyboarding and/or a computer literacy test may also be required.
- Meet with a counselor who will discuss placement test results and registration for courses consistent with the student's present academic levels.

To promote success, the results of the placement test help determine a student's readiness to begin coursework in a chosen major. Course prerequisites vary from major to major. An HTC counselor advises students if they will be required to take prerequisite developmental courses in math, writing, reading, or English as a Second Language (ESL). If students believe that their placement test scores do not represent their level of skill in a particular area, they may retake that portion of the placement test. Retests will be scheduled at a subsequent date.

International Students (F-1 Visa)

International students are required to pay non-resident tuition for their first academic year and be enrolled in 12 or more credits each semester (fall and spring). Students who have an F-1 visa are eligible to apply for resident tuition after one academic year of being a full-time student and in legal status. They can do so by completing a change of residency form, which is available through the Admissions Office. Attendance at an International Student Orientation is mandatory. Upon arrival at the college, students must present their I-94, visa, and passport bio page to the International Student Advisor. International students must also purchase the health insurance, which is available through MnSCU. It is required that students have this insurance before they begin studying at HTC. International students are responsible for maintaining their legal status while studying at HTC.

Post-Secondary Enrollment Options (PSEO) for High School Students

High school students with demonstrated academic achievement and the maturity to succeed in a college environment may be admitted to Hennepin Technical College. Post-Secondary Enrollment Options (PSEO) programs are intended to promote a more rigorous curriculum and to provide a wider variety of options to public high school juniors and seniors. The Post-Secondary Enrollment Options program allows juniors and seniors the opportunity to earn college credits or to use those credits toward the completion of high school graduation requirements. Entrance is determined by Hennepin Technical College on a space available basis.

ELIGIBILITY CRITERIA - Review the following eligibility criteria to determine if you qualify for any of Hennepin Technical College's PSEO programs.

- You have a C average or better on the official copy of your high school transcript.
- You have a satisfactory attendance record based on your high school's policies. (Exceptions will be considered based on a recommendation of the high school counselor or principal and an interview with an HTC counselor.)
- You attend a high school (other than the 13 member districts of Intermediate District 287) and take less than a full-time high school load.
- Exceptions will be considered on an individual basis.

To Apply for PSEO Admission at Hennepin Technical College

1. Complete the Application for Enrollment indicating the campus of your choice.
2. Include a copy of your most recent high school transcript with the application. (An Individual Education Plan (IEP) and assessment summary, if applicable, may be required.)
3. Include a complete copy of your immunization records with the application if you are not currently enrolled in a Minnesota public high school.
4. Complete the Minnesota Department of Education PSEO forms parts 1 and 2, including signatures.
5. Submit all of the above to the campus of your choice.

Admissions Office
Hennepin Technical College
Brooklyn Park Campus
9000 Brooklyn Boulevard
Brooklyn Park, MN 55445

Admissions Office
Hennepin Technical College
Eden Prairie Campus
13100 College View Drive
Eden Prairie, MN 55347

After You Have Submitted the Application

The Admissions Office will contact you with information about visiting the campus. During the time that you are scheduled to visit the campus you will:

- Complete placement testing in the areas of writing, reading, and math; a keyboarding and/or computer literacy test may also be required for your major.
- Meet with an HTC counselor who will discuss your assessment results and registration for courses consistent with your present academic level.
- The Registrar's Office will contact you with information regarding registration, orientations, and start dates.

Contact the Admissions Office if you have questions.

Brooklyn Park Campus Admissions
(763) 488-2450

Eden Prairie Campus Admissions
(952) 995-1452

Persons Under 16 Years of Age

Persons under 16 years of age who have not graduated from high school must contact an HTC counselor prior to beginning the admissions process.

Background Study of Students in Health and Child Care Programs

Minnesota law requires that any person who provides services that involve direct contact with children, patients, and residents at a health care or child care and development facility licensed by the State of Minnesota have a background study conducted by the state. If an individual is disqualified from having direct patient/resident/child contact, it is highly unlikely that the facility will allow the individual to participate in the clinical or practicum experience. Anyone refusing to cooperate in the criminal background study cannot participate in the clinical experience. The college does not guarantee an alternative placement. If no facility is available for the clinical or practicum placement, continuation in the program major may not be possible.

Selecting a Major

A major is the specific A.A.S. degree, diploma, or certificate in which a student is enrolled. Students will declare a major during the admissions process. Students who wish to change their major during their enrollment should schedule an appointment with a counselor.

Associate in Applied Science (A.A.S.) Degree

A.A.S. Degrees prepare students for job entry positions in specific occupational areas that typically require two years of education with a strong general education component. A.A.S. degrees have a credit range from 64-72 credits. Hennepin Technical College offers Associate in Applied Science Degrees in selected majors. A.A.S. degrees are awarded to students upon satisfactory completion of all degree requirements.

Diploma

Diplomas prepare students for job entry positions that typically require one to two years of education with general education included. Diplomas have a credit range from 32-64 credits. Diplomas are awarded to students upon satisfactory completion of all diploma requirements.

Advanced Technical Certificate

Advanced Technical Certificates prepare students for career advancement and enhancement opportunities that require less than one year of education. These certificates require previous related work experience or graduation from a related program of study. Certificates have a credit range from 10-30 credits.

Occupational Certificate

Occupational Certificates prepare students for job entry positions that require less than one year of education. Certificates have a credit range from 10-30 credits.

Orientation

Orientation sessions are held for new students each semester. Orientation provides students with information about college policies, procedures, and services. **Students are responsible for the information provided at orientation and the policies and procedures in the Student Handbook.** Student Handbooks are distributed at orientation, and are also available at the Admissions Office and in the Bookstore.

Readmission

Students who have not enrolled in Hennepin Technical College courses for a period of two or more consecutive semesters or who have formally withdrawn from HTC must apply for readmission. Students returning to the same major in which they were previously enrolled are required to adopt the educational plan as it is defined in the current catalog.

Immunization Requirement

Minnesota Law (M.S.135A.14) requires that all students born after 1956 and enrolled in a public or private post-secondary school in Minnesota be immunized against diphtheria, tetanus, measles, mumps, and rubella allowing for certain specified exceptions. No proof of immunization is needed from students who are assumed to be up-to-date with their immunizations due to requirements imposed by their previous school enrollment. These include: students who graduated from a Minnesota high school in 1997 or later and transfer students from a different post-secondary school in Minnesota if transcripts or other information from the previous school indicate that the student has met immunization requirements.

Immunization forms are available online or at the Registration Office. Students cannot register a second time without this information.

Transfer of Credit

Transfer of Credit from Another College to HTC

Lower division credits earned at a college or university accredited by a regional accrediting association will be considered for transfer toward general and/or technical education requirements.

Students pursuing an A.A.S. degree, diploma, or certificate at HTC who have already earned a M.A., M.S., B.A., B.S., A.A., A.S., or A.A.S. from a regionally accredited college or university may receive a block transfer to satisfy the General Education requirements of their degree, diploma, or certificate. However, if the HTC degree, diploma, or certificate requires a specific math or computer literacy course and the student has not completed a general education math or computer literacy course as part of their previous degree, the student will need to do so in order to satisfy their HTC degree, diploma, or certificate requirements.

Any college level course can be considered for transfer toward General Education and/or Technical Studies Electives.

When a student is not eligible for a block transfer or when transferring individual courses to satisfy specific A.A.S. degree, diploma and/or certificate requirements, courses will be evaluated on a course-by-course basis. Courses with a 75% content match to the required HTC course can be transferred and used to satisfy specific course requirements in their A.A.S. degree, diploma, and/or certificate program.

A block transfer of up to eight credits of related technical courses may be granted for incoming college level courses for which there is not a similar HTC course. Credit granted will apply to technical electives. Final approval of this transfer will be at the discretion of program faculty.

A block transfer of up to nine credits may be granted for incoming college level general education courses for which there is not a similar HTC course. Credit granted will apply to general education electives. Minnesota Transfer Curriculum guidelines will be used to categorize transferred courses into one of ten MnTC goal areas. Credit for coursework that does not fit into any goal area will not be granted.

College level courses in which a student has received a grade of A, B, C, D, P, or S shall be considered for transfer evaluation. (Nursing students should consult with Nursing program faculty regarding specific program transfer requirements.)

If a student's cumulative GPA at sending institution is less than 2.0, D grades will not be accepted in transfer from that school. No F grades will be accepted in transfer. Technical courses must have been completed within the past five years to be considered for transfer. Transfer grades are not calculated in a student's GPA.

Refer to the HTC website for additional transfer information.

Minnesota Transfer Curriculum (MnTC)

The Minnesota Transfer Curriculum (MnTC) is intended to help students transfer credits within public colleges and universities in Minnesota. MnTC courses are designed to give students a college-level general education curricula that focuses on the skills and knowledge needed to support the technical courses in their A.A.S. degree program and to be successful in today's society.

Minnesota Transfer Curriculum (MnTC) at Hennepin Technical College

Hennepin Technical College offers A.A.S. degrees in many of its programs. By definition, an A.A.S. degree at HTC requires 18 or more credits of general education courses from at least three different goal areas of the Minnesota Transfer Curriculum.

Hennepin Technical College offers courses in eight different goal areas of the Minnesota Transfer Curriculum **www.mntransfer.org/MnTC/mntccourses.html.** These MnTC Goal areas are as follows:

- **MnTC Goal 1: Communication**
  COMM2050 Interpersonal Communications
  COMM2060 Small Group Communications
  ENGL2120 Writing and Research
  ENGL2125 Technical Writing
  ENGL2130 Oral Presentations
- **MnTC Goal 2: Critical Thinking**
  COMM2060 Small Group Communications
  PHIL2100 Critical Thinking
- **MnTC Goal 4: Mathematical/Logical Reasoning**
  MATH2100 Concepts in Mathematics
  MATH2200 College Algebra
- **MnTC Goal 5: History and the Social and Behavioral Sciences**
  SSCI2000 Marriage and Family
  SSCI2100 Introduction to Sociology
  SSCI2200 Principles of Microeconomics
  SSCI2300 General Psychology
  SSCI2310 Psychology throughout the Lifespan
- **MnTC Goal 6: Humanities and Fine Arts**
  ENGL2130 Creative Writing
- **MnTC Goal 7: Human Diversity**
  COMM2020 Intercultural Communication
  COMM2050 Interpersonal Communication
  SSCI2310 Psychology throughout the Lifespan
- **MnTC Goal 8: Global Awareness**
  COMM2020 Intercultural Communication
- **MnTC Goal 9: Ethics**
  PHIL2200 Ethics

Program instructors, with the guidance of their advisory committees, have selected MnTC courses that are provided by the general education department. Questions regarding the MnTC should be directed to the Transfer Specialist or a college counselor.

Residency Credits

To be eligible for an A.A.S. degree, diploma, or certificate, a student must earn one-third of the credit requirements for a diploma or certificate and 20 of the credits for an A.A.S. degree at Hennepin Technical College.

Transfer of Credit to Another Post-Secondary Institution

Credit courses in majors at Hennepin Technical College are intended to provide employment skills and, in some situations, transfer to other colleges. The number of credits that may be transferred is determined by the receiving institution. A.A.S. degrees, diplomas, and certificates do not typically transfer as a block to four-year institutions.

Credit for Prior Learning

Students who are able to demonstrate learning acquired prior to enrollment at HTC may be able to receive credit for their learning experience. A non-refundable fee may be charged for the evaluation of this learning. HTC recognizes four different methods of awarding credit for prior learning:

1. **Transfer of Credit:** Course credits taken at other institutions may be eligible for transfer to HTC as described in the Transfer Policy.
2. **Test-out:** After being admitted to the college, it may be possible to earn credit for courses offered at HTC by successful completion of an exam. This examination may take the form of a written test, an oral examination, or other demonstrations of competency.

   Test-out may not be utilized to obtain credit for a course in which the student is currently enrolled, a course that the student had previously taken and received a letter grade, had previously failed, had taken for audit, or had withdrawn from. Students are not permitted to test more than once for any course. A grade of "C" or better, as determined by the evaluator, is required for credit.

   Test-out grades are not calculated in a student's GPA. A fee will be charged for each credit attempted. Forms for the test-out process are available at the Registration Office.

3. **Advanced Placement (AP):** Credits may be awarded to students who have completed the Advanced Placement Exams and have scored at or above the level indicated for specific credit. Details explaining the process and necessary criteria are available from the Counseling Office.

4. **Portfolio: Credit for Prior Learning:** Hennepin Technical College students may apply to obtain course credit based on a previous relevant life/work experience. The experience shall be from employment or learning, recent and relevant, and of satisfactory performance. Students must demonstrate college level learning through a portfolio process. Some courses may not have this option available.

   A. Hour/Credit Ratio: College credit granted shall not be based on hours of experience but on relevant college level learning achieved.

   B. Maximum Credit Granted: The maximum number of credits awarded for prior learning will be one-third or less of the number required for the student's program, depending on the amount of learning that can be verified and documented.

   C. Recency: The life/work experiences must have taken place within 5 years prior to the request date.

   D. Grade: Credit awarded for college level learning shall be noted on the student transcript in the transfer credit section as Prior Experiential Learning.

   E. Faculty will determine if credit will be granted.

   F. A non-refundable fee will be charged prior to evaluation for each course for which credit is being requested. Students may obtain forms and procedures for this process at the Registration Office. Detailed verification and documentation for this process will be required.

Financing Your Education

Financial Aid

Financial Aid is available for full- and part-time students. Students must declare a major in a program that is at least 16 credits in length, leading to an A.A.S. degree, diploma, or certificate.

The types of aid typically available include:

1. PELL Grant
2. State Grants
3. Supplemental Educational Opportunity Grant
4. Stafford Loan, PLUS Loan, and SELF Loan
5. Federal and State Work Study

Students must file the Free Application for Federal Student Aid (FAFSA). . The HTC school code is 0 10491. Once the FAFSA is processed by the Department of Education and received electronically by HTC, additional information may be requested from students. This process is called verification. When verification is complete, an award letter will be mailed to students.

The Higher Education Amendments require all colleges to establish a standard of satisfactory progress for all financial aid recipients. It is important to review the Satisfactory Academic Progress Policy section.

Additional information about financial aid can be found on the HTC web site.

Students can view their financial aid status online using their HTC Student ID and PIN.

Required Credit Level for Federal Financial Aid

Full-time	12 or more credits per semester
Three-quarters time	9 to 11 credits per semester
Half-time	6 to 8 credits per semester
Less than half-time	1 to 5 credits per semester

Required Credit Level for Minnesota State Grant

Full-time	15 or more credits per semester

Required credit level for Federal Stafford Loan is at least half-time status each semester

Note: For student loan eligibility, students who have not earned 30 credits are considered first year financial aid recipients. Students who have earned 31 credits or more are considered second year financial aid recipients.

Agency Funding/Third Party Authorization

When a student's tuition, fees, and/or bookstore purchases are billed directly to an outside agency or organization, the process is termed "third-party billing". The college agrees to bill the agency or organization directly on behalf of the student. The college must receive written authorization from the sponsoring agency or organization before the third-party billing can be processed. It is the student's responsibility to ensure the **Third Party Authorization for Payment** is received by the college each term before the tuition payment deadline.

Agencies or organizations requiring course completion or proof of grades before they authorize payment are considered tuition reimbursement programs. These programs do not qualify for the third-party billing process. Students participating in tuition reimbursement programs are responsible to make their own payment arrangements, according to the college's tuition payment policy, and seek reimbursement directly from their sponsoring agency or organization.

Veterans

Veterans should contact the Veterans' Coordinator located in the Financial Aid Office. The Veterans' Coordinator is prepared to assist students with veterans' benefits. To contact the Veterans' Coordinator, call (763) 488-2491 for the Brooklyn Park Campus and (952) 995-1471 for the Eden Prairie Campus.

Scholarships

Students are encouraged to apply for scholarships. The scholarship awards are based on both performance and/or financial need. Application forms and a list of the available scholarships may be obtained from the Financial Aid Office and on the HTC website.

FACTS Tuition Payment Plan

To help you meet your educational expenses, Hennepin Technical College contracts with FACTS Tuition Management to offer a convenient way to pay your tuition in monthly installments. The FACTS program is not a loan program; therefore, you have no debt, there are no interest or finance charges assessed and there is no credit check. The only cost to budget monthly payments through FACTS is a $25 per semester nonrefundable enrollment fee. Using FACTS is simple. Enrollment is done on-line, which is simple and easy. Additional information is available on the HTC website.

Tuition and Fee Information

Tuition Information

The college establishes a tuition payment deadline for each semester. Students adding courses after the payment deadline must pay their tuition by the Friday of the week they register. Students who do not pay their tuition and fees by the tuition payment deadline will have their courses dropped unless one or more of the following is true:

- You completed your Financial Aid application and received your official Award Letter.
- Hennepin Technical College received an authorization for payment from an employer or a funding agency sufficient to cover your tuition and fees.
- You enrolled as a high school PSEO student and you submitted a three-part form to the registration office authorizing your enrollment.
- You enrolled in the college Tuition Payment Plan and paid the required down payment **(FACTS e-cashier).**
- The college received advance payment of a scholarship sufficient to cover your tuition and fees.

Students may view their account balances and pay online by accessing the HTC website. For more information about tuition payment methods, including the Tuition Payment Plan, see the HTC website.

Application Fee

All persons who apply for admission to the college will be assessed a non-refundable $20 application fee which is due prior to acceptance. The Minnesota State Colleges and Universities' Board of Trustees set this fee.

Tuition Rates

Hennepin Technical College is a member institution of the Minnesota State College and Universities (MnSCU) System. As such, approximately 70 percent of the cost of education is funded through state appropriation of tax dollars. The remaining 30 percent is covered by tuition and fee revenue. The college, in consultation with students, established tuition and fee rates for the academic year and the MnSCU Board of Trustees approved these rates. Tuition rates are available on the HTC website.

A limited number of courses have a different tuition rate. Some courses have required personal property fees. This information is noted in the course schedule.

Student Activity Fee/ Student Association Fee

Each student pays a student activity fee of $0.85 per credit, plus a student life fee of $0.50 per credit, up to a maximum of $17.55 per semester as established by the Student Senate. These fees support the activities of the Student Senate and the student life board. Each student also currently pays a state student association fee of $0.28 per credit. This fee is authorized by MN statute and set each year by the association.

Parking Fee

All students are required to pay a parking fee if they park a vehicle on campus. The fee is $1.60 per credit, including sales tax, up to a maximum of $24 per semester. Students taking CEU courses pay $1.60 per CEU.

Technology Fee

Each student registered for credit courses will be assessed a technology fee of $3 per credit each semester.

Intent to Graduate Processing Fee

A $20 non-refundable Intent to Graduate processing fee must be paid at the time of submitting the Intent to Graduate form to the Registration Office. One fee per term will be collected should a student file more than one Intent to Graduate form.

Non-Sufficient Funds (NSF) Check Fees

There will be a $15 service charge for all checks returned for non-sufficient funds or other reasons.

Transcript Fee

Currently enrolled students may receive one free official transcript during each semester of enrollment. The number of free transcripts is not cumulative. Additional official transcripts for currently enrolled students cost $5 for each transcript. Students who are not currently enrolled must remit $5 for each official transcript.

Other Fees/Late Fees

Other fees may be charged during the school year. Late fees may be charged to past due accounts. Contact the Tuition Office for current information.

Books, Tools and Other Costs

The college furnishes up-to-date equipment in its lab areas. Materials to work on projects may also be provided. Students must purchase books, personal tools, other supplies, and special clothing if required.

Methods of Payment

There are three methods of payment at Hennepin Technical College:

1. You may pay online using a credit card. The college accepts VISA, MasterCard, and Discover. Online payments apply immediately to your student account.
2. You may pay monthly installments by entering into an agreement with FACTS Tuition Management. The college contracts with FACTS to provide the Tuition Payment Plan. FACTS will automatically withdraw your payment from a bank account or credit card once a month and then transfer the payment to the college.
3. You may pay in person on campus during regular business hours or leave your payment in the drop box when the service window is closed.

The college discourages mailing, faxing, or phoning in credit card payments. The college cannot guarantee the privacy of credit card information provided by mail, fax, or phone.

Registration for Credit Courses

Currently enrolled students are expected to meet with their faculty advisor prior to registration. All currently enrolled students will register online. A student must have the following for online registration:

- A Student ID Number
- A Personal Identification Number (PIN)

Students are responsible for meeting course prerequisites and/or placement test score requirements. Course prerequisites are identified in the college catalog and online. Students who have not met the course requirements must receive authorization from a counselor or a faculty advisor prior to registering.

Students are responsible for all tuition and fees incurred by registering for courses. Students may view their account balances and pay online by accessing the HTC website. For more information about tuition payment methods, including the Tuition Payment Plan, see the HTC website. Nonpayment of tuition and fees may result in a student's courses being dropped.

Course Only Enrollment

Students who are not seeking an A.A.S. degree, diploma, or certificate but wish to take courses may do so by registering during the open registration period before the start of the semester. When registering the first time, students must submit an HTC application and a one-time, $20 non-refundable application fee. The application and fee can be submitted at the time of registration.

Students who wish to register prior to the open registration date must complete the admissions process.

Students who do not complete the admissions process/placement testing prior to enrolling in courses will be required to do so after attempting four credits. Please refer to the Placement Testing section.

Persons 62 Years of Age or Older

Minnesota residents age 62 or older are eligible to attend Hennepin Technical College at a reduced rate. Senior rate registrations will be accepted on a space available basis. For course availability, check online or contact the Registration Office on the **day the course is scheduled to begin.** Seniors must pay for books, supplies, fees, and materials. All college policies apply to these students including satisfactory academic progress standards.

Adding Courses

- Students may add courses during the first five days of the semester.
- Students may add courses at any time during the semester if the course has not started and there are openings in the course.
- If a student wishes to add a course after the fifth day of the semester or after the start date of a late starting course, instructor permission is required.
- Adding courses may not be done by telephone. Adding courses may not be done online after the fifth day of the semester.
- Students are not officially enrolled in a course until the Add/Drop form has been completed, required signatures obtained, and additional tuition and fees paid.

Dropping Courses

- Drops may be completed by contacting the Registration Office either in person, by telephone or online. Dropping a course online will be allowed through the fifth day of the semester.
- Students may drop a course at any time during the semester except during the last ten school days of the semester excluding Saturdays. If a course has concluded, a drop will not be allowed.
- If a student drops a course and receives a full refund (see Dropping a Course/Total Withdrawal from School in the Refund section) no credit is given for any work that may have been completed, and the course will not be recorded on the student transcript.
- Courses dropped for partial or no refund after the refund period will be recorded on the student transcript with a grade of 'W' (withdrawal). No credit is given for any work that may have been completed.
- The date the completed Add/Drop form is presented to the Registration Office or the date the drop is phoned in to the Registration Office, is the official date of the drop.
- Dropping a course may affect a student's continued eligibility for financial aid. You must contact the Financial Aid Office whenever your credit load or enrollment plans change. Refer to the Satisfactory Academic Progress section.
- International students on an F-1 visa must meet with their Counselor or International Student Advisor before dropping any courses to verify that they will not jeopardize their full-time student status.

Refunds

Dropping a Course (Reduction of Course/Credit Load)

Courses Starting the First Week of the Semester

Students may drop any course during the first five days of the semester and receive a 100% refund of tuition and fees. Drops for Friday evening and Saturday classes must be submitted by the fifth day of the semester or by the end of the next business day, whichever is later.

Courses Starting After the Fifth Day of the Semester

Some courses have a published start date that occurs after the fifth day (or the first Saturday) of the semester. A student who elects to drop a course in this category will be provided a refund of tuition and fees on the following basis:

- Course dropped before scheduled start date
  100% Refund
- Course dropped by the end of the business day following the start date of the course
  100% Refund
- Courses dropped after the 100% refund period
  NO REFUND

If you are receiving financial aid, check with the Financial Aid Office prior to dropping any courses. Dropping a course may affect the amount of financial aid for the term.

For courses that meet 3 times or less, a refund will be issued only if the course is dropped 24 hours prior to the first class session.

Total Withdrawal from Hennepin Technical College

Students who drop all their credits and formally withdraw from the college will receive a refund of their tuition and fees based on the following schedule

Withdrawal Period

- 1st through 5th day of the semester
  100% Refund
- 6th through 10th day of the semester
  75% Refund
- 11th through 15th day of the semester
  50% Refund
- 16th through 20th day of the semester
  25% Refund
- after the 20th day of the semester
  NO REFUND

To drop a course or withdraw from HTC, contact the Registration Office either in person or by **telephone.** Failure to attend class does not qualify as a drop or withdrawal. **Unless you officially drop a course or withdraw from school, you are responsible for full tuition and fees.**

Refunds are paid by check and mailed to the student regardless of the form of payment.

Refund checks will be issued within fifteen calendar days of the official withdrawal from a course. If a course is canceled or if tuition collection is made in error, the tuition will be adjusted without penalty. If a student has received some form of financial aid (grants or loans), all or a part of any refund may be returned to the financial aid program.

Refund and add/drop timelines may be different for summer semester because of the shorter time frame.

Withdrawal from College/Return of Title IV Funds (Financial Aid Recipients)

If a student completely withdraws from all credits for a term before the 60% point of that term, the financial aid disbursed is subject to the Federal Return of Title IV Funds. Students "earn" financial aid in proportion to the time they are enrolled up to the 60% point of the term. The unearned share of financial aid is returned in the following order: Federal Unsubsidized Stafford Loan, Federal Subsidized Stafford Loan, PLUS Loan, Federal Pell Grant, Federal SEOG. The student may need to repay a portion of financial aid he/she received.

Note: If a student withdraws before his/her financial aid is disbursed, the student is responsible for the tuition due to the College.

Course Information

Technical Courses

Technical courses lead toward an A.A.S. degree, diploma, or certificate; contain the technical knowledge and skill necessary to perform the tasks required for job entry, job enhancement, or job advancement.

General Education

General education is an essential component of a student's success in technical education. An integrated approach to general education is applied and respects individual learning styles and needs. HTC is committed to integrating into all majors the learner outcomes listed in the learner outcome section of this document.

Required Courses

Courses listed as required in an A.A.S. degree, diploma, or certificate must be successfully completed to meet graduation requirements.

Elective Courses

Courses listed as electives in an A.A.S. degree, diploma, or certificate provide students with the opportunity to select courses to satisfy graduation requirements.

Student Choice Electives

Students may select any college level credit course to apply to the technical elective portion of the A.A.S. degree, diploma or certificate according to the following schedule. Student choice electives may be courses taken at HTC or college level courses accepted for transfer at HTC.

Total Major Credits	Elective Credits of Student's Choice
64 or more	5
63-48	4
47 or less	3

Course Numbering System

- **Minnesota Transfer Curriculum**

  The Minnesota Transfer Curriculum represents a coordinated effort among public two- and four-year colleges and universities to offer general education courses that may transfer from one Minnesota institution to another. Hennepin Technical College's 2000 level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

- **College Level**

  College level courses are numbered 1000 or above.

- **Developmental Level**

  Developmental courses are numbered 0999 or lower. These courses may be necessary to prepare students for college level work but cannot be applied toward an A.A.S. degree, diploma, or certificate.

Course Prerequisites

Course prerequisites are listed in the course description section of the catalog. Students who have not met course prerequisite(s) are responsible for obtaining authorization from program faculty or a counselor.

A course taken for audit will not satisfy a prerequisite.

Course Schedules

Course schedules are made available each semester. The course schedule is available on the HTC website.

Grading

Grading Policy

Hennepin Technical College provides students with three grading options. Students must declare grading options at the time they register. Semester and cumulative grade point average (GPA) is calculated on A, B, C, D, and F grades and listed on the student transcript. Option 1 will be used for all students unless options 2 or 3 are declared.

Option 1: Letter grades of A, B, C, D, or F will be assigned to each course as an evaluation of student performance.

A: performance greatly exceeds course requirements (4 quality points per credit)

B: performance surpasses course requirements (3 quality points per credit)

C: performance meets course requirements (2 quality points per credit)

D: performance minimally meets course requirements (1 quality points per credit)

F: performance is unsatisfactory (0 quality points per credit)

Letter grades of A, B, C, D, and F will be used in computation of GPA. A grade of F will not satisfy a graduation requirement nor will it count as a course completion for calculation of satisfactory academic progress.

Option 2: The Pass/No Credit option is for students who are not interested in receiving a letter grade but would like to receive credit for the course. Students must achieve the equivalent of "C" or better in order to receive a passing grade.

P: performance meets course requirements (C or better) of course requirement

NC: performance does not meet course requirements

Grades of P or NC will not be used in computation of GPA. A grade of NC will not satisfy a graduation requirement nor will it count as a course completion for calculation of satisfactory academic progress. No more than 10% of the total credits within a major can be pass (P) grades to count toward graduation.

Option 3: The audit (AU) option is for students who want to take a course and not receive a grade. Students selecting this option may choose to participate fully in the class by completing assignments, taking tests, and receiving evaluative feedback.

AU: indicates taking a course without receiving credit or a grade. An AU will appear on the student transcript. Audited courses do not count toward course load for students receiving financial aid or veterans' benefits. The cost of auditing a course is the same as taking the course for credit. Audits cannot be converted to a letter grade and will not satisfy a course prerequisite nor a graduation requirement.

Other grade types:

W: indicates a student has withdrawn or dropped a course. A "W" is not calculated in GPA but counts as an attempted but not completed course in the calculation of satisfactory academic progress.

Repeated Courses: When a course is repeated, both courses and grades earned will be shown on the student's transcript. The course that was previously taken is not counted in GPA calculation but will count as an attempted but not completed course for calculation of satisfactory academic progress.

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 a letter grade of A, B, C, D, or F were received. GPA is computed on a semester and a cumulative basis.

GPA is not calculated on test-out grades, transfer grades, or articulated courses.

GPA Example

Student's Grades		Quality Points		Credits		Total Grade Points
A	=	4.00	X	3	=	12.00
B	=	3.00	X	2	=	6.00
C	=	2.00	X	3	=	6.00
D	=	1.00	X	3	=	3.00
F	=	0.00	X	1	=	0.00
		TOTAL		12	=	27.00
					=	27 ÷ 12
				GPA	=	**2.25**

Grade Appeal

Students who feel their grade is inaccurate and cannot resolve the issue with their instructor may appeal their grade through the use of the student appeal procedure. Appeal forms are available at the Registration Office. Appeals to change grades must be submitted **within one semester** of completion of the course.

Maximum Credit Load

The maximum semester credit load is 19 credits. Students should not exceed this limit unless their grades are above average and they have obtained authorization from their advisor/counselor prior to registration.

Student Recognition

President's List

The President's List shall be determined each semester based on the following:

- A declared major
- A semester GPA of 3.5 or greater
- Enrollment status:
  - Full-time recognition: 12 or more credits completed during the semester
  - Part-time recognition: 6-11 credits completed during the semester
  - Only courses with grades A-F are considered in determining enrollment status

Graduation

Award

An award is the document a student receives for completion of the requirements of an A.A.S. degree, diploma, or certificate.

Requirements

In order for students to graduate from an A.A.S. degree, diploma, or certificate program, students must file an Intent to Graduate form with the Registrar one semester prior to the semester in which the program requirements will be completed. A GPA of 2.00 or greater in all coursework that counts toward graduation is required.

Ceremony

A formal graduation ceremony is held fall and spring semester for students who graduate from an A.A.S. degree, diploma, or certificate program. Students who have filed an Intent to Graduate form are encouraged to participate.

Honors

Students who have a cumulative GPA of 3.5 or greater will be recognized at the graduation ceremony.

Student Support Services

A primary goal of Hennepin Technical College is to assist students in making maximum progress toward their educational, career, and personal goals.

Counseling

Students and prospective students are encouraged to consult with counselors in the Student Support Services area on academic, career, or personal concerns. Counseling services include career information, advising, determination of major and concentration, selection of courses, assistance with academic and study problems, specialized testing, and personal counseling. Students are given the opportunity to meet with a counselor in a confidential setting in which they may explore their goals, aptitudes, interests, and any special circumstances. For more information, contact the Counseling Office at Brooklyn Park Campus at (763) 488-2547 or Eden Prairie Campus at (952) 995-1451.

Learning Resource Center (LRC)

The Learning Resource Center (LRC) is available to all students at Hennepin Technical College. The LRC provides a supportive learning environment in which students can receive individual tutoring or participate in structured student groups. The LRC staff is committed to helping students learn and succeed.

The types of assistance available through the Learning Resource Center are:

- tutoring
- guided study groups
- academic success skills
- test preparation
- specialized learning software

Contact the Learning Resource Center staff for more information at Brooklyn Park Campus at (763) 488-2451 or at Eden Prairie Campus at (952) 995-1548.

Student Advising

A faculty advisor is assigned to provide assistance in planning a program of study consistent with the students' educational and employment objectives. Faculty advisors assist students in selecting courses, clarifying college policies and procedures, interpreting graduation requirements, and overcoming barriers to their educational success. Students are encouraged to meet with their advisor several times each semester. All students with a declared major are encouraged to meet with their faculty advisor during advising week. Students who have not declared a major receive advising services from counselors.

Career Development Services

Career Development Services at Hennepin Technical College effectively assist you in identifying a career path. Making the right career choice can be a very interesting, challenging, and involved process. Whether students are making a career change, returning to the workforce, undergoing a transition, or entering college for the first time, there are options available to help make an informed, well-planned decision. For more information, contact the Assessment Coordinator at (952) 995-1545.

Placement Testing

Hennepin Technical College supports student success. In accordance with MnSCU board policy, testing is administered to place students into appropriate courses that ensure the best chance for success in college. Testing is required for students who declare a major or after registering for four cumulative credits. Picture identification is required before the placement test can be administered. (See your counselor for testing exemptions.) Students are required to enroll in courses at or below their assessed skill level. Students also will be required to complete all necessary prerequisite coursework.

If English is not your primary language, you may be required to take the ESL test. Please call (952) 995-1545 for details.

Support Services for Students with Disabilities

Hennepin Technical College offers support services to qualified individuals with documented disabilities once they initiate a request and are approved for services by the Disability Services Coordinators. These services include:

- Disability-related career and program information, advising, and support.
- Classroom and laboratory accommodations in accordance with the Americans with Disabilities Act. For example, extended test time, test reading, note-taking, and/or alternative text format.
- Advocacy in arranging accommodations or in mediating grievances.
- Transitional services for students entering college or entering the workforce, including assistance in coordinating services with outside agencies.
- Interpreters for Deaf or hard-of-hearing students.

Other helpful services that are available to any enrolled student include:

- Tutoring in the Learning Resource Center, including assistance with basic academic and technical skills, study skills, time management, and test anxiety.
- Personal and career counseling, information and support provided by the counseling staff.

Disability Services Coordinators work with students on an individual basis to establish eligibility for reasonable accommodations. For assistance, contact Sara Laviolette, Disability Services Coordinator at Brooklyn Park Campus, at (763) 488-2477 or John Heinrichs, Disability Services Coordinator at Eden Prairie Campus, at (952) 995-1544.

To reach the Disability Services Coordinators by TTY, call (763) 488-2571.

Multicultural/International Student Advisor

A Multicultural/International Student Advisor is available to assist students with achieving their educational and career goals, and serves as an advocate for all students from diverse cultural backgrounds. Services include:

- international student admissions and advising
- academic and personal advising
- assistance with financial aid/scholarship information.
- assistance with Bureau of Citizenship and Immigration Services (BCIS) rules, regulations, and requirements.
- referrals to other support services and resources on- and off-campus.

To contact the Multicultural/International Student Advisor, call (763) 488-2425 for the Brooklyn Park Campus or (952) 995-1440 for the Eden Prairie Campus.

Job Placement Service

Hennepin Technical College provides free job placement services to all students and graduates. The Job Placement Office is available to assist students in finding full- or part-time employment. To contact the Job Placement Office, call (763) 488-2411.

The Job Placement Office staff and college faculty work closely with employers to provide job opportunities for students in all programs.

The HTC Student Job Connections website is also available for all students and graduates to conveniently view current job opportunities.

Graduate Follow-up

When students graduate, they are asked to provide job placement information for the graduate follow-up system. This follow-up system provides summary data for future students and employers. Each student's assistance is needed to help HTC provide accurate data.

English as a Second Language (ESL)

English Language Learners are an important part of HTC' college community. HTC' s goal is to help our ELL students be successful at HTC and beyond. Students who want to succeed in a Technical College program need a good understanding of English, a strong vocabulary, good study skills, and knowledge of American culture. They also need to learn some of the special vocabulary that is used in training for different careers.

Hennepin Technical College has classes at different levels for students who need to improve their English before beginning career training. Students who want to take these courses need to take a test first. Then they can talk with counselors about which classes would help them the most.

The English as a Second Language (ESL) Program and Project ACCESS both support the learning of English Language Learners (ELL) on campus.

ESL Program

The English as a Second Language Program offers two levels of English courses. The courses develop a student's basic level reading, writing, listening, speaking and grammar skills.

Project ACCESS

The goal of Project ACCESS is to prepare English Language Learners for enrollment in career programs. Project ACCESS also offers two levels of courses. Courses focus on student's academic and career skills. Students will learn reading, writing, listening, speaking, leadership, and technology skills needed in the college classrooms. Classes also introduce students to vocabulary needed for success in math classes. Special classes will be offered for students with manufacturing or nursing majors. The Project ACCESS courses are for ELL students with an intermediate-level of English or higher.

ACCESS Center

The ACCESS Center is a place on campus to help our immigrant and refugee students. The Center offers many services such as help with financial aid, admissions, program placement, tutoring, career counseling and job placement procedures. The ACCESS Center can also help in locating services for social and academic support, and more. To contact the ACCESS Center, call Brooklyn Park Campus at (763) 488-2577 or Eden Prairie Campus at (763) 995-1429.

Student Rights and Responsibilities

Satisfactory Academic Progress

Students are required to maintain satisfactory academic progress for all credits attempted. Satisfactory Academic Progress (SAP) is defined as completing 67 percent or more of all credits attempted and maintaining a cumulative GPA of 2.0. After a total of six or more credits have been attempted, a student's SAP will be evaluated.

At this time students not completing 67 percent or better of all credits attempted and not achieving a GPA of 2.0 or greater will be given one enrollment period to achieve the expected level of performance. Students not completing 67 percent or more of all credits attempted and not achieving a GPA of 2.0 or greater by the end of that period will not remain in good standing.

Process for Implementing Satisfactory Academic Progress Policy

- Satisfactory Academic Progress will be evaluated each semester.
- All credits attempted will be included in the evaluation.
- SAP will be monitored in a timely manner according to the college procedures.

Probation

All students not meeting the Satisfactory Academic Progress requirements after attempting 6 or more credits will be placed on academic probation.

Suspension

Students not meeting the Satisfactory Academic Progress requirements for a second consecutive semester will be placed on academic suspension. The conditions required for reinstatement will be stated in the letter indicating student suspension. Students placed on suspension may initiate an appeal with a counselor.

Appeal Process

Students suspended for unsatisfactory academic progress have the right to appeal the decision based on an unusual or extenuating circumstance that may have resulted in the student's performance issues. Examples of unusual or extenuating circumstances include, but are not limited to:

- Medical issues
- Death of an immediate family member
- Other one time occurrences

To appeal suspension based on GPA or completion rate, the student needs to schedule a meeting with a counselor to discuss the reasons for appeal.

The student needs to complete the Student Appeal Form along with:

- A written statement describing the unusual or extenuating circumstance that has been a barrier to satisfactory academic work,

- Any forms, letters, records, or other documentation that may substantiate the claim, particularly in the case of medical issues, and
- A written recommendation from a HTC counselor.

Appeals submitted without the required documentation will be denied. Student Appeal forms are available at the Registration Office. Appeals must be directed to the Registrar or Vice President of Student Affairs by the date indicated in the Academic Suspension letter.

Financial Aid Recipients:

Additional Satisfactory Academic Progress Measurement

Maximum Time Frame

Federal financial aid regulations allow for financial aid eligibility up to but not exceeding 150% of the credits needed to complete the student's chosen degree, diploma, or certificate, including those credits that the student has transferred from another college. A student who has reached the maximum time frame for his/her degree, diploma or certificate is suspended from financial aid. **There is no probationary period for this requirement.**

Appeal Process for Maximum Time Frame Suspension

Students who have reached the maximum time frame for financial aid and who have only a few courses left to complete his/her degree or certificate may appeal to have the suspension lifted for ONLY the courses needed to finish. To file an appeal for maximum time frame suspension, a student must meet with a HTC counselor to discuss an academic plan for completion. The academic plan outlines the courses needed for completion and the semester each will be taken. Students must submit a copy of the academic plan along with the Financial Aid Suspension Letter to the Financial Aid Office for review. If approved, the student's financial aid will cover only courses related to completion of the degree, diploma, or certificate. Financial Aid Appeal Forms submitted without required documentation will be denied.

It is possible to be on academic suspension for maximum time frame and not be on academic suspension for the GPA and completion rate.

Re-establishing Financial Aid Eligibility Following Suspension:

Students on academic probation remain eligible for financial aid.

Students on academic suspension are not eligible for financial aid

The student's eligibility for financial aid may be re-established in one of the following ways:

- The student is enrolled at HTC and improves the GPA and/or completion rate to the minimum standards.
- The student successfully appeals the suspension.

Treatment of Grades

Grade of A, B, C, D, and P are included in the calculation of the credits attempted as courses successfully completed. Grade of NC, W, and F are included in the calculation of credits attempted as courses not successfully completed.

Course Repeats

For a course that is repeated, the original grade will remain on the transcript but will not be used in the GPA calculation. The original course credits remain in the number of attempted credits but are removed from the credits earned calculation. While this has no punitive impact on GPA, the percentage of completion will reflect the original course as attempted and not earned.

Withdrawals

A student may withdraw from a course or courses after the posted drop period. A grade of 'W' is given and will not impact GPA negatively but will be listed as credits attempted and not earned in calculating a student's percentage of completion. Completion of at least 67% of credits attempted and maximum time frame can be affected.

Transfer Credits

Transfer credits are those credits earned at another college and accepted at HTC. Transfer credits do not impact GPA or the percentage of completion but will enter into the calculation for maximum time frame.

Developmental Coursework

Coursework below the 1000 level is included in the calculation of grade point average, completion rate and maximum time frame.

Academic Fresh Start Policy

The college recognizes that a returning student may have had a period of low academic performance during their academic career for a variety of reasons. For this student, the college has developed a Fresh Start option, which will permit a student at Hennepin Technical College to request that grades from two semesters of previous college work be put aside and not counted in the overall cumulative grade point average and completion rate.

1. The Academic Fresh Start Policy is available on a case-by-case basis only to students whose coursework was taken at Hennepin Technical College. The policy is a one-time opportunity only.
2. The student must have been away from Hennepin Technical College for a minimum of three (3) calendar years and the student must have a cumulative GPA of less than 2.0 and/or a completion rate of less that 67%.
3. The student will be permitted to pick and choose courses within the semester/s to be considered. Only grades of D, F, NC, and W can be considered. A maximum of two terms of courses may be considered.
4. The coursework forgiven will remain on the student's transcript; however, the credits and the grades will not be calculated into the student's cumulative grade point average or completion rate. (Note: For financial aid recipients, see Academic Fresh Start statement in the Satisfactory Academic Progress Policy section.)
5. In order to meet eligibility requirements for this opportunity, the student must have completed a minimum of 12 credits in residence at Hennepin Technical College with at least a 2.0 GPA after returning from the minimum 3-year absence. The student must apply for academic forgiveness within one calendar year after completing the 12 semester credits with at least a 2.0 GPA. Work completed at another institution cannot be used to satisfy this requirement.

The conditions and procedures for the Academic Fresh Start Policy will be provided to the student. The student will be required to submit an appeal. The appeal will include a detailed explanation of the circumstances for the grades received and what changes have occurred. A transcript will be attached to the petition and supporting documentation will also be considered. The appeal will be reviewed on a case-by-case basis and considered on its individual merit. The petition must be signed and dated by the student.

Code of Student Conduct

Hennepin Technical College recognizes that all students have responsibilities as citizens and as members of the college community. Student responsibilities include regular attendance, punctuality, positive relationships with other students and staff, appropriate behavior and attitude, and acceptable progress, all of which are necessary to assure success in the college. Students are expected to assume personal responsibility as adults for their behavior without supervision.

This code of student conduct incorporated appropriate due process and identifies steps to be taken when conduct occurs which may violate the code. A summary of this code shall be published in the student handbook and other documents as deemed appropriate. The student handbook shall be available in the Admissions Office. The college may revise the code as needed.

Complaint and Grievance Policies

In accordance with MnSCU Board policy 3.8, a student has the right to seek a remedy for a dispute or disagreement through a designated complaint and grievance policy. A student should use available informal means to have decisions and/or actions reconsidered before filing a complaint or grievance. No retaliation of any kind shall be taken against a student for participation in a complaint or grievance. Complaints and grievance procedures are protected under data privacy rights. A summary of this policy shall be published in the student handbook The student handbook shall be available in the Admissions Office. The college may revise the code as needed.

Student Appeals Procedure Student Responsibility

Students are responsible for knowledge of and compliance with Hennepin Technical College policies, procedures, and regulations. If questions arise regarding policies or procedures, students are encouraged to meet with their advisor or a counselor to help clarify understanding and interpretation.

Student Rights

Students have the right to appeal decisions made regarding their academic standing, final course grades, graduation requirements, tuition requirements, and other similar issues. The college will act on requests for appeal when there is documented evidence of unusual circumstances or an inability of the college to deliver stated

educational services. The Student Appeals Policy and Procedure is published in the student handbook The student handbook shall be available in the Admissions Office. The college may revise the code as needed.

Student Records/ Transcripts

The campus Registrar's Office is the official recorder of student academic records and progress. Questions concerning credits completed, course registration, add/drops, transfer credits, graduation requirements, program requirements, transcripts, and similar concerns should be discussed with an advisor or counselor.

Students wishing to obtain an official transcript must file a transcript request form with the campus Registration Office. The transcript request form authorizes the release of confidential information. Transcripts will not be released without a signed release from the student. Currently enrolled students may receive one free official transcript during each semester of enrollment. The number of free transcripts is not cumulative. Additional official transcripts for currently enrolled students cost $5 for each transcript. Students who are not currently enrolled must remit $5 for each official transcript.

Access to Student Educational Records

Hennepin Technical College, in compliance with federal and state laws, protects the privacy of student records. Students have a right to inspect their records and, upon written request, may review their records with a school representative to interpret the contents.

The following information has been designated as "directory information" and is available to the general public:

- Student name
- Dates of enrollment and/or registration
- Major
- Degrees, diplomas, and certificates earned
- Special student recognition/achievements

To prevent the release of this information, the student should notify the Registration Office in writing.

With the exception of "directory information," which is public information, the data you provide will be released only with your written consent or to the following persons/entities, which are authorized by law to receive and use the data:

- Minnesota State Legislature
- Congress
- Board of Trustees of the Minnesota State Colleges and Universities
- Higher Education Services Office
- State, Federal, and Independent Auditors
- School officials with legitimate educational interests
- Minnesota Department of Jobs and Training
- Department of Human Services

NOTICE: If you are currently enrolled in or receiving services from one college or university within the Minnesota State College and University System (System), your academic records from that institution are available to officials of other schools within the System while you are in attendance. If you seek or intend to enroll at another institution within the System, your academic records from other institutions are also accessible to officials at the school where you are seeking or intend to enroll. Disclosures of your records to other schools under other circumstances may require your prior written consent.

You have the right to request a copy of records that have been disclosed. You also have the right to request a hearing to correct any inaccurate, incomplete, or misleading information in those disclosed records. For further information about your rights, please contact the Registrar at the college or university that supplied the records.

Student Organizations

Student Senate

The Student Senate is responsible for coordinating student activities on the campus. Recommendations for improving the educational and social aspects of campus life may be submitted through the Student Senate. Each program is encouraged to elect representatives to the Student Senate. All meetings are open to guests.

Student Life Committee

The Student Life Committee is made up of students and staff members from the College to aid in the support of educational clubs and groups on campus. Upon receiving requests, the Student Life Committee is responsible for disbursing student life fees to campus organizations for their activities. Members of the committee are selected by the campus Student Senate.

Student Organizations/Clubs

A number of other student professional organizations or clubs are currently available at Hennepin Technical College. Students are encouraged to become active in these activities which tend to enhance professional and career development. See your faculty advisor for more information.

Phi Theta Kappa

Students earning a 3.5 GPA and successfully completing 12 college level credits at Hennepin Technical College will be invited to join the international honor society Phi Theta Kappa. New members will be recognized at a college induction ceremony held twice per year with a membership pin and certificate. After induction, students must maintain a 3.25 GPA to remain in the honor society. A notation of membership will appear on graduates' diplomas and transcripts and a stole will be provided to wear at graduation denoting Phi Theta Kappa membership.

SkillsUSA

SkillsUSA provides quality education experiences for students in leadership, teamwork, citizenship, and character development. SkillsUSA programs include local, state, and national competitions in which students demonstrate occupational and leadership skills.

Emergency Information

Emergency Closings

In the event of inclement weather or other emergency closings, listen to radio station WCCO (830 AM) for the official Hennepin Technical College closing notification.

Emergency Procedures and Drills

Emergency procedures are posted in all areas of the campus. If an emergency or drill occurs, follow the directions given by your instructor.

Health, Safety, and Security

Crime Awareness and Campus Security Act

An annual security report is made available to the public and students as required by the Federal Crime Awareness and Campus Security Act. Annually updated and distributed, it contains specified crime statistics and other information related to campus safety issues. Copies of the report are available on the HTC website at **www.hennepintech.edu/about/security.htm** or through the office of the Safety Director.

Safety

Safety has the highest priority at Hennepin Technical College. Every attempt is made to comply with safety standards. Safety instruction is included in program curriculum.

Safety glasses and protective equipment must be worn in designated campus areas. Minnesota State law provides that every person shall wear industrial quality eye protection in designated campus areas. Students must purchase their own safety glasses, which are available at the campus bookstore. Contact lenses may not be worn in designated lab areas without the addition of safety glasses. Students who do not comply with safety requirements are subject to disciplinary action or termination.

Hepatitis

Hepatitis is a serious disease caused by a virus that attacks the liver. There are three different types of Hepatitis, identified as A, B, and C, each one with a different level of seriousness and symptoms.

Students should be aware of the dangers of this disease and are encouraged to visit the HTC website at **www.hennepintech.edu/students/register/hepatitis.htm** for more information about the disease and how to prevent it.

Bloodborne Pathogens and Communicable Diseases

Hennepin Technical College will eliminate or minimize students occupational exposure to blood or other body fluids and comply with the OSHA Bloodborne Pathogens Standard, 29 CFR 1910.1030.

HTC respects the rights of individuals with a communicable disease to education, to privacy, and to be free from discrimination. Hennepin Technical College also acknowledges the rights of others in the system to be educated in a safe environment and the need to educate administrators, faculty, and students about preventing and reducing the risk of transmission of communicable diseases.

Students with communicable diseases will not be excluded from attending school in their regular classrooms so long as their attendance does not create a substantial risk of the transmission of illness to other students or employees of the college.

Copies of the complete policy are available on the HTC website.

Accident Reporting

If an injury should occur at the college, it must be reported to the college and an accident report form must be completed immediately. When emergency medical services are necessary, students are referred to their family physician or to the nearest emergency treatment facility. Students are responsible for the cost of their medical insurance and treatment while enrolled at Hennepin Technical College.

Insurance

All students are encouraged to carry health insurance while attending Hennepin Technical College. Application forms and a summary of benefits for optional health insurance are available in the Tuition Office.

Students enrolled in some courses will be required to carry liability insurance coverage. Students who have their own liability coverage must provide verification of this coverage to their course instructor at the start of the course.

International students are required to purchase the health insurance policy that is offered by Minnesota State Colleges and Universities and may purchase it at the Tuition Office.

Other Information

Technical College Guarantee

Hennepin Technical College guarantees to the employers of our graduates that these graduates have competency in entry-level skills as defined within the syllabi of their program of graduation. If the employer of one of our graduates believes that the employee is deficient in one or more competencies from a course(s) successfully completed by the student as defined in the standards listed in the student handbook, the technical college will retrain the employee with up to 12 credits of tuition free instruction.

Bookstore

The bookstore is a retail service facility operated to meet the needs of students and staff. Textbooks and supplies for courses may be purchased at the college bookstore at each campus. You can also visit their web site at **www.bookstore.hennepintech.edu**

Food Service

Meals are available in the cafeteria at reasonable prices on both campus sites. Vending machines are available for snacks and beverages.

The highly acclaimed gourmet dining rooms located on the Brooklyn Park and Eden Prairie campuses are open to the public on a limited basis during lunch hours. Visitors and students may enjoy a variety of foods prepared by the Culinary Arts students in a restaurant setting. Reservations are advised.

Parking

Student parking is available at each campus. Students may not park in areas that are designated for visitors or staff. Handicapped parking spaces are available at each campus.

Housing

Hennepin Technical College maintains a list of housing opportunities in close proximity to each campus. This list provides cost and description information about area rental possibilities. HTC does not provide on-campus housing.

Child Care

On-campus childcare is not available. Consult with a college counselor about off-campus childcare.

Student I.D. Cards

All students are encouraged to obtain a HTC student I.D. card. Student I.D. card will be required for use of IMC materials and to utilize the Student Computer Labs. Other college procedures may also require a Student I.D. card. The first Student I.D. card issued to a student is free; replacement cards are $5 each. The $5 fee must be paid at the Tuition Office before the replacement card can be picked up.

Instructional Materials Center (IMC) Library

Supporting the curriculum of the college, the Brooklyn Park and Eden Prairie Instructional Materials Centers (IMC) are important components of the learning environment at Hennepin Technical College. Students have access to each IMC collection through PALS, an online database, which provides access not only to the HTC collections but to the collections of Minnesota state universities, Minnesota community colleges, other Minnesota technical colleges, the University of Minnesota, some public libraries, and many special libraries. Students are provided access to materials in other libraries through interlibrary loan. The local collections include books, magazines, CD-ROMs, videotapes, filmstrips, audiocassettes, books on tape, and slides.

Services provided to students include teaching basic information access and evaluation skills that are applied when using online magazine databases, other online databases, online encyclopedias, CD-ROM resources, reserve materials, reference materials, and the Internet. Individual or class tours and orientations are available.

Besides having access to PALS for searching library collections, the IMCs provide Internet access at each of their PALS workstations. Students have access in the IMC to audiovisual equipment, such as TV/VCRs, slide projectors, filmstrip projectors, plus IBM and Macintosh computers with word-processing software and CD-ROM capabilities, copy machines, and typewriters. Students must present a HTC Student I.D. card to check out materials from the IMC.

Student Computer Labs

Hennepin Technical College offers students access to a variety of software and the Internet in an open lab environment. Computer lab assistants are available in the labs to assist students with many of the software applications. Only college students with current HTC Student I.D. card may utilize the Student Computer Lab. Hours for the Student Computer Lab are posted.

Advisory Committees

Hennepin Technical College has always worked closely with business and industry. Currently, over 500 volunteers serve on approximately 40 program advisory committees. The members come from a cross-section of business and industry.

Advisory committees guide, strengthen, and improve programs. Members are active and knowledgeable in their occupations and provide valuable input to help assure that all programs are relevant and will meet student needs.

Business & Computer CAREERS

Accounting Careers

Associate in Applied Science Degree	Accounting (BP/EP)	64 Credits	Page 30
Diploma	Accounting Technician (BP/EP)	32 Credits	Page 30

Computer Careers

Associate in Applied Science Degree	Network Administrator/Analyst (BP/EP)	72 Credits	Page 31
Associate in Applied Science Degree	C Programmer (EP)	72 Credits	Page 32
Associate in Applied Science Degree	Visual Basic Programmer (EP)	72 Credits	Page 32
Associate in Applied Science Degree	PC Support Specialist (BP)	72 Credits	Page 33
Associate in Applied Science Degree	Web Programmer (BP/EP)	72 Credits	Page 34
Diploma	PC Support Specialist (BP)	64 Credits	Page 34
Diploma	Network Administrator/Analyst (BP/EP)	64 Credits	Page 35
Diploma	C Programmer (EP)	64 Credits	Page 36
Diploma	Visual Basic Programmer (EP)	64 Credits	Page 36
Diploma	Web Programmer (BP/EP)	64 Credits	Page 37
Diploma	Workplace Administrative Professional (BP/EP)	36 Credits	Page 37
Advanced Technical Certificate	Help Desk (BP)	15 Credits	Page 38
Advanced Technical Certificate	Visual Basic Programmer (EP)	24 Credits	Page 38
Advanced Technical Certificate	C Programmer (EP)	28 Credits	Page 38
Advanced Technical Certificate	Network Administrator/Analyst - MCSA (BP)	18 Credits	Page 38
Advanced Technical Certificate	Windows Networking (BP/EP)	24 Credits	Page 39
Advanced Technical Certificate	Linux/Unix Networking (BP/EP)	24 Credits	Page 39
Advanced Technical Certificate	Oracle Database Specialist (EP)	24 Credits	Page 39
Advanced Technical Certificate	Microsoft Database Specialist (EP)	28 Credits	Page 40
Advanced Technical Certificate	Java Programmer (BP/EP)	28 Credits	Page 40
Advanced Technical Certificate	Cisco Networking (EP)	27 Credits	Page 40
Advanced Technical Certificate	Webmaster (BP/EP)	27 Credits	Page 41
Occupational Certificate	Microsoft Office (BP)	29 Credits	Page 41
Occupational Certificate	Computer Service Desk Technician (BP/EP)	27 Credits	Page 41
Occupational Certificate	Workplace Administrative Assistant (BP/EP)	26 Credits	Page 42
Occupational Certificate	Broadband Installation Technician (EP) *(Pending MnSCU Approval)*	30 Credits	Page 42

Medical Office Careers

Associate in Applied Science Degree	Medical Administrative Assistant (BP/EP)	64 Credits	Page 42
Diploma	Medical Administrative Assistant (BP/EP)	48 Credits	Page 43
Occupational Certificate	Medical Transcriptionist (BP/EP)	28 Credits	Page 43
Occupational Certificate	Medical Receptionist (BP/EP)	27 Credits	Page 44

Residential Property Management

Occupational Certificate	Residential Property Management (EP)	16 Credits	Page 44

Business & Computer CAREERS

Accounting Careers

Associate in Applied Science Degree
Accounting (BP/EP)

Overview
The accountant plays a key role in the management of companies by providing financial information for operation and decision-making purposes. Your knowledge and skill in the preparation of financial statements, budgets, forecasts, tax analysis and reports is critical to the success of every business. Operation of computerized accounting software, spreadsheets and other data information applications is required. Accountants work in a team environment, which requires the ability to communicate, both orally and in writing, critical information to management. Students entering this field must be self-motivated, clear thinking, quality conscious and persistent in accomplishing a wide variety of tasks.

Career Opportunities
Accountants are needed in every type of service or manufacturing operation. You may be employed by financial institutions, governmental agencies, private business or in public accounting firms. America's continuing shift to a world-wide service oriented economy has resulted in an accelerating demand for individuals who possess financial knowledge and accounting skills.

Technical Studies Required		**42 Credits**
ACCT1100	Principles of Accounting I	4
ACCT1105	Principles of Accounting II	4
ACCT1111	Payroll Accounting	3
ACCT1125	Excel	3
ACCT1130	Peachtree Accounting Software	3
ACCT1135	QuickBooks	3
ACCT1140	Business Law	3
ACCT2200	Intermediate Accounting I	4
ACCT2205	Intermediate Accounting II	4
ACCT2210	Cost Accounting	4
ACCT2220	Managerial Accounting	3
ACCT2231	Income Tax	4

General Education Required		**16 Credits**
COMM2060	Small Group Communication	3
ENGL2120	Writing and Research	3
MATH2200	College Algebra	4
PHIL2100	Critical Thinking	3
PHIL2200	Ethics	3

General Education Elective **3 Credits**
Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective **3 Credits**
Any ACCT or CCIS course that is not required for this award may be used as an elective.

Total Associate in Applied Science Degree **64 Credits**

Diploma
Accounting Technician (BP/EP)

Overview
The accounting technician is a key member in the accounting department who specializes in a certain area of preparing and maintaining the business records. You may be assigned to the accounts receivable, accounts payable, payroll or other accounting areas. Skills in journaling and posting transactions, preparing financial reports or in the preparation of payroll records are necessary. Accounting technicians must be able to use computerized accounting software, spreadsheets, word processing and other data information software. Individuals entering this field must be team players who display a willingness to share their specialized knowledge with other accounting areas.

Career Opportunities
Accounting Technicians will find high employment demand in both the private and public sectors of business. Large organizations often seek accounting individuals to become specialists in their accounting department. This rapidly growing specialization trend focuses on employing highly trained accounting technicians who can deal with complex problems in their area of expertise.

Technical Studies Required		**23 Credits**
ACCT1100	Principles of Accounting I	4
ACCT1105	Principles of Accounting II	4
ACCT1111	Payroll Accounting	3
ACCT1125	Excel	3
ACCT1130	Peachtree Accounting Software	3
ACCT1135	QuickBooks	3
CCIS1035	Word for Windows I	3

General Education Required		**6 Credits**
COMM2060	Small Group Communication	3
PHIL2100	Critical Thinking	3

Technical Studies Elective **3 Credits**

Any ACCT or CCIS course that is not required for this award may be used as an elective.

Total Diploma **32 Credits**

Computer Careers

Associate in Applied Science Degree
Network Administrator/Analyst (BP/EP)

Overview

This degree provides the skills for operating multiple computers in a network environment. Platforms may include Windows NT/2000, Linux/Unix, Novell and the Internet. Skill development includes the fundamentals of data communications hardware, software and operating systems.

Career Opportunities

Positions are available as Network Administrators and Network Developers.

Technical Studies Required		**46 Credits**
CCIS1000	Information Systems	3
CCIS1101	Windows XP	3
CCIS1110	Windows Admin I	3
or		
CCIS1715	Implementing M/S Windows 2000 Professional	3
CCIS1121	Linux Admin I	3
CCIS1201	Data Comm & Network Design	3
CCIS1210	Networking Principles	3
CCIS1301	HTML using XHTML	3
CCIS1505	Fundamentals of Programming	4
or		
CCIS1515	Web Programming Overview	3
CCIS2122	Linux Admin II	4
CCIS2150	Windows Admin II	4
or		
CCIS1720	Implementing M/S Windows 2000 Server	4
CCIS2221	Network Configuration	4
CCIS2240	Novell Administration	4
CCIS2841	Client/Server Theory	4
MATH1010	Beginning Algebra	2
General Education Required		**12 Credits**
ENGL2120	Writing and Research	3
or		
ENGL2125	Technical Writing	3
One of these:		
COMM2060	Small Group Communication	3
MATH2100	Concepts in Mathematics	3
MATH2200	College Algebra	4
PHIL2100	Critical Thinking	3
One of these:		
COMM2050	Interpersonal Communication	3
PHIL2200	Ethics	3
SSCI2100	Introduction to Sociology	3
SSCI2200	Principles of Microeconomics	3
SSCI2300	General Psychology	3
One of these:		
COMM2050	Interpersonal Communication	3
COMM2060	Small Group Communication	3
COMM2130	Public Speaking	3

General Education Elective **6 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges

Technical Studies Elective **8 Credits**

Any CCIS course that is not required for this award may be used as an elective.

Recommended:

CCIS1351	Advanced HTML using XHTML	4
CCIS2160	Linux Admin III	4
CCIS2270	Windows Admin III: IIS and Exchange	4
CCIS2591	JavaScript	4
CCIS2601	A+ Hardware/Software Support	4
CCIS2701	Database Design and SQL	4

Total Associate in Applied Science Degree **72 Credits**

Associate in Applied Science Degree C Programmer (EP)

Overview
This degree offers the skills necessary for computer application development, database management and object design. The C programming language will be used to design, code, document and implement computer programs. Exposure to client/server theory and development tools will further familiarize students with the current trends in distributed processing.

Career Opportunities
Positions are available as Computer Programmers.

Technical Studies Required		**49 Credits**
CCIS1000	Information Systems	3
CCIS1101	Windows XP	3
CCIS1121	Linux Admin I	3
CCIS1201	Data Comm & Network Design	3
CCIS1210	Networking Principles	3
CCIS1505	Fundamentals of Programming	4
CCIS1570	C Language Family I	4
CCIS2550	Visual Basic I	4
CCIS2570	C Language Family II	4
CCIS2580	C Language Family III	4
CCIS2701	Database Design and SQL	4
CCIS2751	Introduction to Oracle	4
CCIS2841	Client/Server Theory	4
MATH1010	Beginning Algebra	2
General Education Required		**12 Credits**
ENGL2120	Writing and Research	3
or		
ENGL2125	Technical Writing	3
One of these:		
COMM2060	Small Group Communication	3
MATH2100	Concepts in Mathematics	3
MATH2200	College Algebra	4
PHIL2100	Critical Thinking	3
One of these:		
COMM2050	Interpersonal Communication	3
PHIL2200	Ethics	3
SSCI2100	Introduction to Sociology	3
SSCI2200	Principles of Microeconomics	3
SSCI2300	General Psychology	3
One of these:		
COMM2050	Interpersonal Communication	3
COMM2060	Small Group Communication	3
COMM2130	Public Speaking	3

General Education Elective **6 Credits**
Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective **5 Credits**
Any CCIS course that is not required for this award may be used as an elective.

Recommended Courses:

CCIS2005	C# and the Microsoft .NET Framework	4
CCIS2595	Java I	4
CCIS2610	XML I	4
CCIS2615	XML II	4
CCIS2630	PHP	4
CCIS2645	Introduction to ASP.NET	4
CCIS2761	Oracle Application Development	4
CCIS2772	Oracle Database Administration I	4

Total Associate in Applied Science Degree **72 Credits**

Associate in Applied Science Degree Visual Basic Programmer (EP)

Overview
This degree offers the skills necessary for computer application development and design. Visual Basic will be used to design, code, document and implement computer applications. Exposure to database management systems and client/server theory will further familiarize students with the current trends in distributed processing.

Career Opportunities
Positions are available as Computer Programmers.

Technical Studies Required		**47 Credits**
CCIS1000	Information Systems	3
CCIS1031	Access	4
CCIS1101	Windows XP	3
CCIS1301	HTML using XHTML	3
CCIS1505	Fundamentals of Programming	4
CCIS2031	Advanced Access	4
CCIS2550	Visual Basic I	4
CCIS2560	Visual Basic II	4
CCIS2701	Database Design and SQL	4
CCIS2751	Introduction to Oracle	4
CCIS2801	Systems Analysis	4
CCIS2841	Client/Server Theory	4
MATH1010	Beginning Algebra	2
General Education Required		**12 Credits**
ENGL2120	Writing and Research	3
or		
ENGL2125	Technical Writing	3
One of these:		
COMM2060	Small Group Communication	3
MATH2100	Concepts in Mathematics	3
MATH2200	College Algebra	4
PHIL2100	Critical Thinking	3
One of these:		
COMM2050	Interpersonal Communication	3
PHIL2200	Ethics	3
SSCI2100	Introduction to Sociology	3
SSCI2200	Principles of Microeconomics	3
SSCI2300	General Psychology	3

One of these:

COMM2050	Interpersonal Communication	3
COMM2060	Small Group Communication	3
COMM2130	Public Speaking	3

General Education Elective **6 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective **7 Credits**

Any CCIS course that is not required for this award may be used as an elective.

Recommended:

CCIS2595	Java I	4
CCIS2610	XML I	4
CCIS2615	XML II	4
CCIS2630	PHP	4
CCIS2645	Introduction to ASP.NET	4
CCIS2761	Oracle Application Development	4
CCIS2772	Oracle Database Administration I	4

Total Associate in Applied Science Degree **72 Credits**

Associate in Applied Science Degree PC Support Specialist (BP)

Overview

This degree offers the necessary microcomputer skills to support the functional areas of a business. Students will learn hardware and software selection, implementation and operation. Software includes operating systems, word processing, spreadsheets, databases, business presentations and networking.

Career Opportunities

Positions are available as PC Support Specialists, PC Trainers, PC Coordinators and Computer Lab Assistants.

Technical Studies Required **51 Credits**

ACCT1125	Excel	3
CCIS1000	Information Systems	3
CCIS1031	Access	4
CCIS1035	Word for Windows I	3
CCIS1041	PowerPoint	4
CCIS1101	Windows XP	3
CCIS1110	Windows Admin I	3
CCIS1121	Linux Admin I	3
or		
CCIS2240	Novell Administration	4
CCIS1201	Data Comm & Network Design	3
CCIS1210	Networking Principles	3
CCIS1301	HTML using XHTML	3
CCIS1320	FrontPage	3
or		
CCIS1325	Web Publishing	3
CCIS2051	MS Office Integration/Outlook	4
CCIS2061	Help Desk/User Support	3
CCIS2601	A+ Hardware/Software Support	4
MATH1010	Beginning Algebra	2

General Education Required **12 Credits**

ENGL2120	Writing and Research	3
or		
ENGL2125	Technical Writing	3

One of these:

COMM2060	Small Group Communication	3
MATH2100	Concepts in Mathematics	3
MATH2200	College Algebra	4
PHIL2100	Critical Thinking	3

One of these:

COMM2050	Interpersonal Communication	3
PHIL2200	Ethics	3
SSCI2100	Introduction to Sociology	3
SSCI2200	Principles of Microeconomics	3
SSCI2300	General Psychology	3

One of these:

COMM2050	Interpersonal Communication	3
COMM2060	Small Group Communication	3
COMM2130	Public Speaking	3

General Education Elective **6 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective **3 Credits**

Any CCIS course that is not required for this award may be used as an elective.

Recommended:

CCIS1045	Word for Windows II	3
CCIS1310	Publisher	3
CCIS1351	Advanced HTML using XHTML	4
CCIS2021	Advanced Excel	4
CCIS2031	Advanced Access	4
CCIS2055	MS Project	3
CCIS2320	Help Desk Internship I	6
CCIS2330	Help Desk Internship II	6
CCIS2360	PC Support Internship I	2-8
CCIS2370	PC Support Internship II	2-8

Total Associate in Applied Science Degree **72 Credits**

Associate in Applied Science Degree Web Programmer (BP/EP)

Overview
The Web Programmer Degree coursework prepares the student to develop business applications for the Internet, using leading edge technologies. The student will master object oriented design and development principles, Java, HTTP protocol, HTML, CGI, database connectivity via web applications, and learn how these technologies are implemented in the Microsoft and Unix platforms.

Career Opportunities
Positions are available as WEB Programmers.

Technical Studies Required		**50 Credits**
CCIS1000	Information Systems	3
CCIS1101	Windows XP	3
CCIS1301	HTML using XHTML	3
CCIS1320	FrontPage	3
or		
CCIS1325	Web Publishing	3
CCIS1351	Advanced HTML using XHTML	4
CCIS1505	Fundamentals of Programming	4
CCIS2591	JavaScript	4
CCIS2595	Java I	4
CCIS2651	Java II	4
CCIS2610	XML I	4
CCIS2630	PHP	4
or		
CCIS2645	Introduction to ASP.NET	4
or		
CCIS2662	Java Server Pages (JSP)	4
CCIS2701	Database Design and SQL	4
CCIS2801	Systems Analysis	4
MATH1010	Beginning Algebra	2
General Education Required		**12 Credits**
ENGL2120	Writing and Research	3
or		
ENGL2125	Technical Writing	3
One of these:		
COMM2060	Small Group Communication	3
MATH2100	Concepts in Mathematics	3
MATH2200	College Algebra	4
PHIL2100	Critical Thinking	3
One of these:		
COMM2050	Interpersonal Communication	3
PHIL2200	Ethics	3
SSCI2000	Marriage and Family	3
SSCI2200	Principles of Microeconomics	3
SSCI2300	General Psychology	3
One of these:		
COMM2050	Interpersonal Communication	3
COMM2060	Small Group Communication	3
COMM2130	Public Speaking	3

General Education Elective **6 Credits**
Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective **4 Credits**
Any CCIS course that is not required for this award may be used as an elective.

CCIS1310	Publisher	3
CCIS2005	C# and the Microsoft .NET Framework	4
CCIS2055	MS Project	3
CCIS2250	Web Experience	4
CCIS2255	Web Portfolio I	1
CCIS2256	Web Portfolio II	1
CCIS2311	Web Programmer Internship	2-8
CCIS2615	XML II	4
CCIS2645	Introduction to ASP.NET	4
CCIS2841	Client/Server Theory	4
Total Associate in Applied Science Degree		**72 Credits**

Diploma – PC Support Specialist (BP)

Overview
This diploma offers the necessary microcomputer skills to support the functional areas of a business. Students will learn hardware and software selection, implementation and operation. Software includes operating systems, word processing, spreadsheets, databases, business presentations and networking.

Career Opportunities
Positions are available as PC Support Specialists, PC Trainers, PC Coordinators and Computer Lab Assistants.

Technical Studies Required		**49 Credits**
ACCT1125	Excel	3
CCIS1000	Information Systems	3
CCIS1031	Access	4
CCIS1035	Word for Windows I	3
CCIS1041	PowerPoint	4
CCIS1101	Windows XP	3
CCIS1110	Windows Admin I	3
CCIS1121	Linux Admin I	3
or		
CCIS2240	Novell Administration	4
CCIS1201	Data Comm & Network Design	3
CCIS1210	Networking Principles	3
CCIS1301	HTML using XHTML	3

CCIS1320	FrontPage	3
or		
CCIS1325	Web Publishing	3
CCIS2051	MS Office Integration/Outlook	4
CCIS2061	Help Desk/User Support	3
CCIS2601	A+ Hardware/Software Support	4

General Education Required **8 Credits**

COMM1016	Teambuilding in the Workplace	2
or		
COMM1040	Job Seeking Skills	2
COMM1050	Communication in the Workplace	2
or		
COMM1130	Customer Service in the Workplace	3
ENGL1020	Essay Fundamentals	2
or		
ENGL1025	Essentials of Technical Writing	2
MATH1005	Business Mathematics	2
or		
MATH1010	Beginning Algebra	2

Technical Studies Elective **7 Credits**

Any CCIS course that is not required for this award may be used as an elective.

Recommended:

CCIS1045	Word for Windows II	3
CCIS1310	Publisher	3
CCIS1351	Advanced HTML using XHTML	4
CCIS2021	Advanced Excel	4
CCIS2031	Advanced Access	4
CCIS2320	Help Desk Internship I	6
CCIS2330	Help Desk Internship II	6
CCIS2360	PC Support Internship I	2-8
CCIS2370	PC Support Internship II	2-8

Total Diploma **64 Credits**

Diploma
Network Administrator/Analyst (BP/EP)

Overview

This diploma provides the skills for operating multiple computers in a network environment. Platforms may include DOS, Windows NT/2000, Linux/Unix, Novell and the Internet. Skill development includes the fundamentals of data communications hardware, software and operating systems.

Career Opportunities

Positions are available as Network Administrators or Network Developers.

Technical Studies Required **44 Credits**

CCIS1000	Information Systems	3
CCIS1101	Windows XP	3
CCIS1110	Windows Admin I	3
or		
CCIS1715	Implementing M/S Windows 2000 Professional	3
CCIS1121	Linux Admin I	3
CCIS1201	Data Comm & Network Design	3
CCIS1210	Networking Principles	3
CCIS1301	HTML using XHTML	3
CCIS1505	Fundamentals of Programming	4
or		
CCIS1515	Web Programming Overview	3
CCIS2122	Linux Admin II	4
CCIS2150	Windows Admin II	4
or		
CCIS1720	Implementing M/S Windows 2000 Server	4
CCIS2221	Network Configuration	4
CCIS2240	Novell Administration	4
CCIS2841	Client/Server Theory	4

General Education Required **8 Credits**

COMM1016	Teambuilding in the Workplace	2
or		
COMM1040	Job Seeking Skills	2
COMM1050	Communication in the Workplace	2
or		
COMM1130	Customer Service in the Workplace	3
ENGL1020	Essay Fundamentals	2
or		
ENGL1025	Essentials of Technical Writing	2
MATH1005	Business Mathematics	2
or		
MATH1010	Beginning Algebra	2

Technical Studies Elective **12 Credits**

Any CCIS course that is not required for this award may be used as an elective.

Recommended:

CCIS1351	Advanced HTML using XHTML	4
CCIS2125	Intrusion Detection and Response	4
CCIS2160	Linux Admin III	4
CCIS2270	Windows Admin III: IIS and Exchange	4
CCIS2591	JavaScript	4
CCIS2601	A+ Hardware/Software Support	4

Total Diploma **64 Credits**

Diploma
C Programmer (EP)

Overview
This diploma provides the skills necessary for computer application development, database management and object design. The C programming language will be used to design, code, document and implement computer programs. Exposure to Client/Server theory and development tools will further familiarize students with the current trends in distributed processing.

Career Opportunities
Positions are available as Computer Programmers.

Technical Studies Required		**47 Credits**
CCIS1000	Information Systems	3
CCIS1101	Windows XP	3
CCIS1121	Linux Admin I	3
CCIS1201	Data Comm & Network Design	3
CCIS1210	Networking Principles	3
CCIS1505	Fundamentals of Programming	4
CCIS1570	C Language Family I	4
CCIS2550	Visual Basic I	4
CCIS2570	C Language Family II	4
CCIS2580	C Language Family III	4
CCIS2701	Database Design and SQL	4
CCIS2751	Introduction to Oracle	4
CCIS2841	Client/Server Theory	4
General Education Required		**8 Credits**
COMM1016	Teambuilding in the Workplace	2
or		
COMM1040	Job Seeking Skills	2
COMM1050	Communication in the Workplace	2
or		
COMM1130	Customer Service in the Workplace	3
ENGL1020	Essay Fundamentals	2
or		
ENGL1025	Essentials of Technical Writing	2
MATH1005	Business Mathematics	2
or		
MATH1010	Beginning Algebra	2
Technical Studies Elective		**9 Credits**

Any CCIS course that is not required for this award may be used as an elective.

CCIS2005	C# and the Microsoft .NET Framework	4
CCIS2595	Java I	4
CCIS2610	XML I	4
CCIS2615	XML II	4
CCIS2630	PHP	4
CCIS2645	Introduction to ASP.NET	4
CCIS2761	Oracle Application Development	4
CCIS2772	Oracle Database Administration I	4
Total Diploma		**64 Credits**

Diploma
Visual Basic Programmer (EP)

Overview
This degree offers the skills necessary for computer application development and design. Visual Basic will be used to design, code, document and implement computer applications. Exposure to database management systems and client/server theory will further familiarize students with the current trends in distributed processing.

Career Opportunities
Positions are available as Computer Programmers.

Technical Studies Required		**45 Credits**
CCIS1000	Information Systems	3
CCIS1031	Access	4
CCIS1101	Windows XP	3
CCIS1301	HTML using XHTML	3
CCIS1505	Fundamentals of Programming	4
CCIS2031	Advanced Access	4
CCIS2550	Visual Basic I	4
CCIS2560	Visual Basic II	4
CCIS2701	Database Design and SQL	4
CCIS2751	Introduction to Oracle	4
CCIS2801	Systems Analysis	4
CCIS2841	Client/Server Theory	4
General Education Required		**8 Credits**
COMM1016	Teambuilding in the Workplace	2
or		
COMM1040	Job Seeking Skills	2
COMM1050	Communication in the Workplace	2
or		
COMM1130	Customer Service in the Workplace	3
ENGL1020	Essay Fundamentals	2
or		
ENGL1025	Essentials of Technical Writing	2
MATH1005	Business Mathematics	2
or		
MATH1010	Beginning Algebra	2
Technical Studies Elective		**11 Credits**

Any CCIS course that is not required for this award may be used as an elective

Recommended:

CCIS2595	Java I	4
CCIS2610	XML I	4
CCIS2615	XML II	4
CCIS2630	PHP	4
CCIS2645	Introduction to ASP.NET	4
CCIS2761	Oracle Application Development	4
CCIS2772	Oracle Database Administration I	4
Total Diploma		**64 Credits**

Diploma – Web Programmer (BP/EP)

Overview

The Web Programmer Diploma coursework prepares the student to develop business applications for the Internet, using leading edge technologies. The student will master object oriented design and development principles, Java, HTTP protocol, HTML, CGI, database connectivity via web applications, and learn how these technologies are implemented in the Microsoft and Unix platforms.

Career Opportunities

Positions are available as WEB Programmers.

Technical Studies Required		**48 Credits**
CCIS1000	Information Systems	3
CCIS1101	Windows XP	3
CCIS1301	HTML using XHTML	3
CCIS1320	FrontPage	3
or		
CCIS1325	Web Publishing	3
CCIS1351	Advanced HTML using XHTML	4
CCIS1505	Fundamentals of Programming	4
CCIS2591	JavaScript	4
CCIS2595	Java I	4
CCIS2651	Java II	4
CCIS2610	XML I	4
CCIS2630	PHP	4
or		
CCIS2645	Introduction to ASP.NET	4
or		
CCIS2662	Java Server Pages (JSP)	4
CCIS2701	Database Design and SQL	4
CCIS2801	Systems Analysis	4
General Education Required		**8 Credits**
COMM1016	Teambuilding in the Workplace	2
or		
COMM1040	Job Seeking Skills	2
COMM1050	Communication in the Workplace	2
or		
COMM1130	Customer Service in the Workplace	3
ENGL1020	Essay Fundamentals	2
or		
ENGL1025	Essentials of Technical Writing	2
MATH1005	Business Mathematics	2
or		
MATH1010	Beginning Algebra	2

Technical Studies Elective **8 Credits**

Any CCIS course that is not required for this award may be used as an elective.

Recommended:

CCIS1310	Publisher	3
CCIS2055	MS Project	3
CCIS2250	Web Experience	4
CCIS2255	Web Portfolio I	1
CCIS2256	Web Portfolio II	1
CCIS2311	Web Programmer Internship	2-8
CCIS2610	XML I	4
CCIS2615	XML II	4
CCIS2630	PHP	4
CCIS2841	Client/Server Theory	4

Total Diploma **64 Credits**

Diploma
Workplace Administrative Professional (BP/EP)

Overview

The workplace administrative professional is a key member of the office team. This individual will use current software applications in word processing, spreadsheets, databases, and business presentations. As a workplace administrative professional, you may have the opportunity to serve as a communications link to the technology staff. Excellent interpersonal skills and the ability to assume additional responsibility are essential.

Prerequisite: CPLT1000 Computer Keyboarding or comparable course. Basic computer literacy, familiarity with the Internet, college-level reading ability, and proficiency in basic mathematics. All students must pass the Computer Literacy assessment test before registering for these courses.

Career Opportunities

Employment may be found with banks, insurance companies, health care facilities, government agencies, educational institutions, retail industries and various service and manufacturing businesses.

Technical Studies Required		**26 Credits**
ACCT1000	Bookkeeping	3
ACCT1125	Excel	3
CCIS1000	Information Systems	3
CCIS1031	Access	4
CCIS1035	Word for Windows I	3
CCIS1041	PowerPoint	4
CCIS1080	Microsoft Office XP	3
CCIS1101	Windows XP	3
General Education Required		**7 Credits**
COMM1016	Teambuilding in the Workplace	2
or		
COMM1050	Communication in the Workplace	2
ENGL1010	Business Communications	3
MATH1000	Prealgebra	2

Technical Studies Elective **3 Credits**

Any CCIS course that is not required for this award may be used as an elective.

Total Diploma **36 Credits**

Advanced Technical Certificate Help Desk (BP)

Overview
This certificate provides the skills needed for a job as a help desk professional in the computer industry. Skill development includes both microcomputer software and hardware. Software includes operating systems, word processing, spreadsheets, databases, presentation packages and networking.

Prerequisite: The student is required to successfully complete the PC Support Specialist degree or diploma before being admitted to this major.

Career Opportunities
Positions are available as help desk professionals.

Technical Studies Required		**15 Credits**
CCIS2061	Help Desk/User Support	3
CCIS2320	Help Desk Internship I	6
CCIS2330	Help Desk Internship II	6
Total Advanced Technical Certificate		**15 Credits**

Advanced Technical Certificate Visual Basic Programmer (EP)

Overview
This certificate is designed to enable computer professionals to acquire knowledge to be a contributor in a client server environment. The skills include client server concepts, database and analysis and design.

Prerequisite: Prior programming experience or coursework required. Basic computer literacy, familiarity with the Internet, college-level reading ability, and proficiency in algebra. All students must pass the Computer Literacy assessment test before registering for these courses.

Career Opportunities
Positions are available as Computer Programmers and Application Designers.

Technical Studies Required		**24 Credits**
CCIS2550	Visual Basic I	4
CCIS2560	Visual Basic II	4
CCIS2701	Database Design and SQL	4
CCIS2751	Introduction to Oracle	4
or		
CCIS2781	SQL Server - TransactSQL	4
CCIS2801	Systems Analysis	4
CCIS2841	Client/Server Theory	4
Total Advanced Technical Certificate		**24 Credits**

Advanced Technical Certificate C Programmer (EP)

Overview
This certificate is designed to enable the computer professional to update their technical programming skills. The emphasis will be on developing technical competency for business applications in C programming language or microcomputers.

Prerequisite: Prior programming experience or coursework required. Basic computer literacy, familiarity with the Internet, college-level reading ability, and proficiency in algebra. All students must pass the Computer Literacy assessment test before registering for these courses.

Career Opportunities
Positions are available as Computer Programmers.

Technical Studies Required		**28 Credits**
CCIS1570	C Language Family I	4
CCIS2570	C Language Family II	4
CCIS2580	C Language Family III	4
CCIS2701	Database Design and SQL	4
CCIS2751	Introduction to Oracle	4
or		
CCIS2781	SQL Server - TransactSQL	4
CCIS2801	Systems Analysis	4
CCIS2841	Client/Server Theory	4
Total Advanced Technical Certificate		**28 Credits**

Advanced Technical Certificate Network Administrator/Analyst – MCSA (BP)

Overview
This certificate is designed for the individual seeking a position in Network Administration. Students gain the skills necessary to administrate a network. Students also learn basic networking and design concepts. Students are introduced to the concepts and practices required of a technology professional in an effort to prepare them to work with network designers and analysts.

Prerequisite: Basic computer literacy, familiarity with the Internet, college-level reading and communication ability, and proficiency in basic mathematics.

Career Opportunities
Positions are available in Network Administrators, Network Analysts and Network Administrator Assistants.

Technical Studies Required		18 Credits
CCIS1210	Networking Principles	3
CCIS1715	Implementing M/S Windows 2000 Professional	3
CCIS1720	Implementing M/S Windows 2000 Server	4
CCIS1725	Managing M/S Windows 2000 Network Environment	4
CCIS1730	Implementing an M/S Windows 2000 Network Infrastructure	4
Total Advanced Technical Certificate		**18 Credits**

Advanced Technical Certificate Windows Networking (BP/EP)

Overview
This certificate is designed to enable the Windows computer professional to learn the fundamentals of networking and data communication and to know how to incorporate the latest data communications equipment in the enterprise.

Prerequisite: Basic computer literacy, familiarity with the Internet, college-level reading ability, and proficiency in basic mathematics. All students must pass the Computer Literacy assessment test before registering for these courses.

Career Opportunities
Positions are available as Network Administrators and Network Developers.

Technical Studies Required		24 Credits
CCIS1110	Windows Admin I	3
or		
CCIS1715	Implementing M/S Windows 2000 Professional	3
CCIS1201	Data Comm & Network Design	3
CCIS1210	Networking Principles	3
CCIS1301	HTML using XHTML	3
CCIS2150	Windows Admin II	4
or		
CCIS1720	Implementing M/S Windows 2000 Server	4
CCIS2221	Network Configuration	4
CCIS2841	Client/Server Theory	4
Total Advanced Technical Certificate		**24 Credits**

Advanced Technical Certificate Linux/Unix Networking (BP/EP)

Overview
This certificate is designed to enable the Linux/Unix computer professional to learn the fundamentals of networking and data communication and to know how to incorporate the latest data communications equipment in the enterprise.

Prerequisite: Basic computer literacy, familiarity with the Internet, college-level reading ability, and proficiency in basic mathematics. All students must pass the Computer Literacy assessment test before registering for these courses.

Career Opportunities
Positions are available as Network Administrators and Network Developers.

Technical Studies Required		24 Credits
CCIS1121	Linux Admin I	3
CCIS1201	Data Comm & Network Design	3
CCIS1210	Networking Principles	3
CCIS1301	HTML using XHTML	3
CCIS2122	Linux Admin II	4
CCIS2221	Network Configuration	4
CCIS2841	Client/Server Theory	4
Total Advanced Technical Certificate		**24 Credits**

Advanced Technical Certificate Oracle Database Specialist (EP)

Overview
This certificate is designed for computer professionals to learn the fundamentals of database application development and database administration in an Oracle environment.

Prerequisite: Strong foundation in computer concepts or coursework required. Basic computer literacy, familiarity with the Internet, college-level reading ability, and proficiency in algebra. All students must pass the Computer Literacy assessment test before registering for these courses.

Career Opportunities
Positions are available as Oracle Database Administrators and Oracle Application Developers.

Technical Studies Required		24 Credits
CCIS2701	Database Design and SQL	4
CCIS2751	Introduction to Oracle	4
CCIS2761	Oracle Application Development	4
CCIS2772	Oracle Database Administration I	4
CCIS2776	Oracle Database Administration II	4
CCIS2841	Client/Server Theory	4
Total Advanced Technical Certificate		**24 Credits**

Advanced Technical Certificate Microsoft Database Specialist (EP)

Overview
This certificate is designed for computer professionals to learn the fundamentals of database application development and database administration in a Microsoft environment.

Prerequisite: Strong foundation in computer concepts or coursework required. Basic computer literacy, familiarity with the Internet, college-level reading ability, and proficiency in algebra. All students must pass the Computer Literacy assessment test before registering for these courses.

Career Opportunities
Positions are available as Microsoft SQL Server Database Administrators and Microsoft Application Developers.

Technical Studies Required		**28 Credits**
CCIS1031	Access	4
CCIS2550	Visual Basic I	4
CCIS2031	Advanced Access	4
or		
CCIS2035	Access for Developers	4
CCIS2701	Database Design and SQL	4
CCIS2781	SQL Server - TransactSQL	4
CCIS2786	SQL Server - System Administration	4
CCIS2841	Client/Server Theory	4
Total Advanced Technical Certificate		**28 Credits**

Advanced Technical Certificate Java Programmer (BP/EP)

Overview
This certificate is designed to enable computer professionals to acquire knowledge to be a contributor in a Java development environment. The skills include Java, database and analysis and design.

Prerequisite: Prior programming experience or coursework required. Basic computer literacy, familiarity with the Internet, college-level reading ability, and proficiency in algebra. All students must pass the Computer Literacy assessment test before registering for these courses.

Career Opportunities
Positions are available as Computer Programmers and Application Designers.

Technical Studies Required		**28 Credits**
CCIS2595	Java I	4
CCIS2651	Java II	4
CCIS2662	Java Server Pages (JSP)	4
CCIS2670	Enterprise Java Beans	4
CCIS2701	Database Design and SQL	4
CCIS2751	Introduction to Oracle	4
or		
CCIS2781	SQL Server - TransactSQL	4
CCIS2801	Systems Analysis	4
Total Advanced Technical Certificate		**28 Credits**

Advanced Technical Certificate Cisco Networking (EP)

Overview
The coursework required for this certificate will prepare students to take the Cisco Certified Network Associate (CCNA) exam. Students will learn to design, build, and maintain computer networks.

Prerequisite: Basic computer literacy, familiarity with the Internet, college-level reading ability, and proficiency in basic mathematics. All students must pass the Computer Literacy assessment test before registering for these courses.

Career Opportunities
Positions are available as Network Administrators, Network Analysts, and Network Engineers.

Technical Studies Required		**27 Credits**
CCIS1201	Data Comm & Network Design	3
or		
CCIS1210	Networking Principles	3
or		
CCIS1410	CCNA-1: Networking Basic	3
CCIS1421	CCNA-2: Routers & Routing Basics	4
CCIS1431	CCNA-3: Switching Basics & Intermediate Routing	4
CCIS1441	CCNA-4: WAN Technologies	4
CCIS1450	CCNP-1: Advanced Routing	4
CCIS1455	CCNP-2: Remote Access	4
CCIS1470	Network Security-1: (IOS Firewalls & VPN's)	4
Total Advanced Technical Certificate		**27 Credits**

Advanced Technical Certificate Webmaster (BP/EP)

Overview
This advanced technical certificate is intended to provide the cross-functional skillset required to implement web-based technologies and systems. Students will learn to control both the front and back ends of a website, host multiple sites, and use a variety of tools to plan, design, organize, maintain, develop, secure and troubleshoot Internet/Intranet solutions for large or small organizations.

Prerequisites: At least two years experience in web design, web programming, networking or equivalent coursework. Basic computer literacy, familiarity with the Internet, college-level reading ability, and proficiency in algebra. All students must pass the Computer Literacy assessment test before registering for these courses.

Career Opportunities
Positions are available as Webmasters, Website Administrators and E-mail Administrators.

Technical Studies Required		**27 Credits**
CCIS1351	Advanced HTML using XHTML	4
CCIS1121	Linux Admin I	3
or		
CCIS2150	Windows Admin II	4
CCIS2221	Network Configuration	4
CCIS2122	Linux Admin II	4
or		
CCIS2270	Windows Admin III: IIS and Exchange	4
CCIS2591	JavaScript	4
or		
CCIS2630	PHP	4
or		
CCIS2645	Introduction to ASP.NET	4
or		
CCIS2662	Java Server Pages (JSP)	4
CCIS2595	Java I	4
or		
CCIS2610	XML I	4
CCIS2701	Database Design and SQL	4
Total Advanced Technical Certificate		**27 Credits**

Occupational Certificate Microsoft Office (BP)

Overview
This certificate is designed for the business professional who needs to become competent in business software most in demand at the personal computer level.

Students must pass Windows 2000 and computer literacy assessment before admittance into this certificate program.

Prerequisite: Basic computer literacy, familiarity with the Internet, college-level reading ability, and proficiency in basic mathematics. All students must pass the Computer Literacy assessment test before registering for these courses.

Career Opportunities
This certificate is designed to improve the computer skills of office personnel.

Technical Studies Required		**29 Credits**
ACCT1125	Excel	3
CCIS1031	Access	4
CCIS1035	Word for Windows I	3
CCIS1041	PowerPoint	4
CCIS1045	Word for Windows II	3
CCIS2021	Advanced Excel	4
CCIS2031	Advanced Access	4
CCIS2051	MS Office Integration/Outlook	4
Total Occupational Certificate		**29 Credits**

Occupational Certificate Computer Service Desk Technician (BP/EP)

Overview
This certificate is designed for the individual seeking a position in the retail service desk environment. Students gain the necessary skills to operate, configure, and troubleshoot the most commonly purchased graphical user interface (GUI). Students also learn basic electronic concepts as they apply to direct current circuits and soldering skills. Students are also introduced to the concepts and practices required of an entry-level technology professional in an effort to prepare them to become service providers.

Prerequisite: Basic computer literacy, familiarity with the Internet, college-level reading and communication ability, and proficiency in basic mathematics.

Career Opportunities
Positions are available as a Computer Service Desk Technician, Computer System Specialist, and PC Technician.

Technical Studies Required		**27 Credits**
CCIS1000	Information Systems	3
CCIS1080	Microsoft Office XP	3
CCIS1101	Windows XP	3
CCIS1210	Networking Principles	3
CCIS2061	Help Desk/User Support	3
CCIS2601	A+ Hardware/Software Support	4
ELEC1000	DC Circuits	4
ELEC1200	Soldering Skills	1
MPRT1270	Troubleshooting the Macintosh	3
Total Occupational Certificate		**27 Credits**

Occupational Certificate
Workplace Administrative Assistant (BP/EP)

Overview
The workplace administrative assistant is a valuable member of the office team who is responsible for a variety of activities that support the day-to-day office operations. Workplace administrative assistants will use current software applications in preparing business documents. Excellent interpersonal skills are essential.

Prerequisite: Basic computer literacy, familiarity with the Internet, college-level reading ability, and proficiency in basic mathematics. All students must pass the Computer Literacy assessment test before registering for these courses.

Career Opportunities
Employment may be found with banks, insurance companies, health care facilities, government agencies, educational institutions, retail industries and various service and manufacturing businesses.

Technical Studies Required		**26 Credits**
ACCT1125	Excel	3
CCIS1035	Word for Windows I	3
CCIS1080	Microsoft Office XP	3
CCIS1101	Windows XP	3
COMM1016	Teambuilding in the Workplace	2
or		
COMM1050	Communication in the Workplace	2
CPLT1005	Skill Building and Document Processing	3
CPLT1060	Internet Quick Start	1
CPLT1100	Introduction to Personal Computers	3
ENGL1010	Business Communications	3
MATH1000	Prealgebra	2
Total Occupational Certificate		**26 Credits**

Occupational Certificate
Broadband Installation Technician (EP)
(Pending MnSCU Approval)

Overview
Broadband Installation Technicians are responsible for the installation and support of a variety of services including Digital Cable, High Speed Data and Digital Phone. In addition to possessing solid customer service skills, the technician should be knowledgeable in the installation and routing of cables, pc configuration and multiple operating systems. Equally important, is the ability to recognize, troubleshoot and resolve problems on the system and with customer's equipment ensuring that all systems are fully operational and the customer understands and is satisfied with the products that they have ordered.

Career Opportunities:
Students completing this 30 credit certificate are employable as broadband installation technicians servicing digital cable, high speed data and digital phones. In Minnesota, employment in this industry is expected to grow faster than average.

Note:
This certificate will be offered Fall 2004 pending MnSCU approval. Course information will be available on the Hennepin Technical College website as it becomes available.

Medical Office Careers

Associate in Applied Science Degree
Medical Administrative Assistant (BP/EP)

Overview
Medical administrative assistants have the opportunity to work on health care teams. Duties performed utilize a knowledge of medical terminology as well as hospital and clinic procedures and may include transcription of reports and correspondence, appointment and meeting scheduling, patient file and office record maintenance, billing and insurance processing. This career requires excellent communication skills and knowledge of patient confidentiality laws. This degree provides students with a broad general education in addition to the technical component to maximize employment opportunities and potential.

Prerequisite: CPLT1000 Computer Keyboarding or qualifying score on keyboarding assessment test.

Prerequisites: Keyboarding speed of 45 net words per minute on a 5-minute timed writing is required before beginning the Medical Transcription I course. (Straight-copy speed test required while enrolled in Anatomy.)

Career Opportunities
Individuals may choose to work in an acute care facility, outpatient clinic, extended care facility, medical insurance office, research facility or another medical environment.

Technical Studies Required		**44 Credits**
ACCT1125	Excel	3
CCIS1101	Windows XP	3
CCIS1035	Word for Windows I	3
CCIS1080	Microsoft Office XP	3
CPLT1005	Skill Building and Document Processing	3
ENGL1010	Business Communications	3
OFCR1301	Medical Terminology	4
OFCR1306	Anatomy/Physiology/Disease Condition	4
OFCR1315	Medical Office Procedures	4
OFCR1321	ICD-9CM Medical Coding	4
OFCR1326	CPT-4 Medical Coding	4
OFCR1331	Medical Transcription I	4
MATH1000	Prealgebra	2

General Education Required		9 Credits
COMM2060	Small Group Communication	3
PHIL2200	Ethics	3
SSCI2100	Introduction to Sociology	3

General Education Elective **9 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective **2 Credits**

Any ACCT, CCIS, or OFCR course that is not required for this award may be used as an elective.

Total Associate in Applied Science Degree **64 Credits**

Diploma
Medical Administrative Assistant (BP/EP)

Overview

Medical administrative assistants have the opportunity to work on health care teams. Duties performed utilize a knowledge of medical terminology as well as hospital and clinic procedures and may include transcription of reports and correspondence, appointment and meeting scheduling, patient file and office record maintenance, billing and insurance processing. This career requires excellent communications skills and knowledge of patient confidentiality laws.

Prerequisite: CPLT1000 Computer Keyboarding or qualifying score on keyboarding assessment test.

Prerequisites: Keyboarding speed of 45 net words per minute on a 5-minute timed writing is required before beginning the Medical Transcription I course. (Straight-copy speed test required while enrolled in Anatomy.)

Career Opportunities

Individuals may choose to work in an acute care hospital, outpatient clinic, extended-care facility, medical insurance office, research facility or another medical environment.

Technical Studies Required		42 Credits
ACCT1125	Excel	3
CCIS1101	Windows XP	3
CCIS1035	Word for Windows I	3
CCIS1080	Microsoft Office XP	3
CPLT1005	Skill Building and Document Processing	3
ENGL1010	Business Communications	3
OFCR1301	Medical Terminology	4
OFCR1306	Anatomy/Physiology/Disease Condition	4
OFCR1315	Medical Office Procedures	4
OFCR1321	ICD-9CM Medical Coding	4
OFCR1326	CPT-4 Medical Coding	4
OFCR1331	Medical Transcription I	4

General Education Required		4 Credits
COMM1016	Teambuilding in the Workplace	2
or		
COMM1050	Communication in the Workplace	2
MATH1000	Prealgebra	2

General Education Elective **2 Credits**

Any HTC college level general education course may be used to satisfy the elective requirement.

Total Diploma **48 Credits**

Occupational Certificate
Medical Transcriptionist (BP/EP)

Overview

The medical transcriptionist produces medical reports which become permanent records of medical, legal and scientific value. This certificate is designed for persons who possess excellent keyboarding skills and who desire specialized training in medical language and transcription techniques. The program is designed to meet the requirements of the national examination provided by the American Association for Medical Transcription for entry-level transcriptionists.

Prerequisite: CPLT1000 Computer Keyboarding or qualifying score on keyboarding assessment test.

Prerequisites: Keyboarding speed of 45 net words per minute on a 5-minute timed writing is required before beginning the Medical Transcription I course. (Straight-copy speed test required while enrolled in Anatomy.)

Career Opportunities

Job opportunities vary and may include outpatient clinics, acute care medical centers, medical insurance offices and independent transcription services.

Technical Studies Required		28 Credits
CCIS1035	Word for Windows I	3
CCIS1080	Microsoft Office XP	3
CPLT1005	Skill Building and Document Processing	3
ENGL1010	Business Communications	3
OFCR1301	Medical Terminology	4
OFCR1306	Anatomy/Physiology/Disease Condition	4
OFCR1331	Medical Transcription I	4
OFCR2331	Medical Transcription II	4

Total Occupational Certificate **28 Credits**

Occupational Certificate
Medical Receptionist (BP/EP)

Overview
The medical receptionist processes telephone calls, greets patients, schedules appointments, maintains patient file data, and may arrange for laboratory and diagnostic services. Accuracy, dependability and a courteous professional manner are essential. This career requires excellent communication skills and knowledge of patient confidentiality laws.

Prerequisite: CPLT1000 Computer Keyboarding or qualifying score on keyboarding assessment test.

Career Opportunities
The medical receptionist will find job opportunities in a variety of health care settings.

Technical Studies Required		**23 Credits**
CCIS1101	Windows XP	3
CCIS1035	Word for Windows I	3
CCIS1080	Microsoft Office XP	3
CPLT1005	Skill Building and Document Processing	3
ENGL1010	Business Communications	3
OFCR1301	Medical Terminology	4
OFCR1315	Medical Office Procedures	4
General Education Required		**4 Credits**
COMM1050	Communication in the Workplace	2
or		
COMM1016	Teambuilding in the Workplace	2
MATH1000	Prealgebra	2
	Total Occupational Certificate	**27 Credits**

Residential Property Management

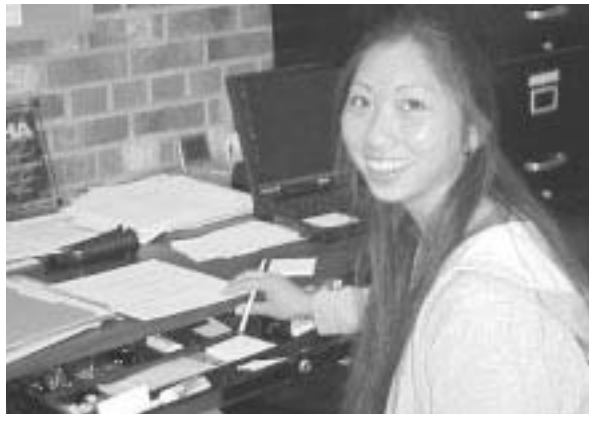
Occupational Certificate
Residential Property Management (EP)

Overview
This certificate provides a series of intense courses designed to provide students the skills necessary for successful employment in the property management industry. The certificate is designed to enhance the skills of persons currently working in property management and also provides the opportunity for others to develop the basic skills needed to enter the industry.

Personal qualities considered essential for this occupation are the ability to work with and serve the needs of others, strong communication skills, leadership skills, and a strong work ethic.

Career Opportunities
Residential property managers are in high demand with over 450,000 rental units in Minnesota. This industry provides a wide range of opportunities in property management including low income, senior, luxury, and other housing related industries as well as government agencies. Positions may include the following career titles: on-site manager, resident manager, business manager, housing manager, community manager, large-site assistant manager, leasing consultant, leasing specialist, accounts clerk, and records manager.

Technical Studies Required		**16 Credits**
RPMG1105	Marketing and Leasing the Multi-Family Property	4
RPMG1205	Budgeting and Financial Administration of Rental Property	4
RPMG1305	Managing the Ground and Physical Plant of Rental Property	4
RPMG1405	Managing People in the Rental Industry	4
	Total Occupational Certificate	**16 Credits**



Construction & Building
CAREERS

Architectural Drafting

Associate in Applied Science Degree	Architectural Drafting and Design (BP/EP)	72 Credits	Page 46
Diploma	Architectural Drafting and Design (BP/EP)	64 Credits	Page 46

Cabinetmaking

Associate in Applied Science Degree	Cabinetmaking (BP/EP)	72 Credits	Page 47
Diploma	Cabinetmaking (BP/EP)	64 Credits	Page 48
Advanced Technical Certificate	CNC Machining for Wood and Plastics (BP)	10 Credits	Page 48

Carpentry

Diploma	Carpentry (BP/EP)	36 Credits	Page 49

Gas Utility Technology

Diploma	Gas Utility Technology (BP)	36 Credits	Page 49

Heating, Ventilation, Air Conditioning and Refrigeration

Associate in Applied Science Degree	Heating, Ventilation, Air Conditioning, and Refrigeration (BP/EP)	72 Credits	Page 50
Diploma	Residential Heating, Ventilating and Air Conditioning (BP/EP)	33 Credits	Page 50
Diploma	Commercial Heating, Ventilating, Air Conditioning and Refrigeration (EP)	32 Credits	Page 51
Advanced Technical Certificate	Commercial Refrigeration (EP)	11 Credits	Page 51
Advanced Technical Certificate	Commercial Heating and Air Conditioning Equipment (EP)	10 Credits	Page 52
Occupational Certificate	Building Service/Maintenance (EP)	11 Credits	Page 52

Industrial Building Engineering and Maintenance

Diploma	Industrial Building Engineering & Maintenance (BP)	44 Credits	Page 52

Construction & Building
CAREERS

Architectural Drafting

Associate in Applied Science Degree
Architectural Drafting and Design (BP/EP)

Overview
Architectural Drafting and Design Technicians prepare drawings by hand and with computer aided design (CAD) technology from rough sketches and specifications. A variety of other duties may be performed depending on the specialty of the employer and the nature of the position. The duties might consist of preparing construction drawings, researching of materials, equipment and codes, preparing material lists for bid, preparing shop drawings, estimating material and construction costs and verifying construction compliance.

Career Opportunities
Most opportunities for architectural drafting graduates are found in the construction industry. Job opportunities may be available in architectural and engineering offices, in the home construction industry, general contracting, production and manufacturing and sales of architectural products.

Technical Studies Required		**53 Credits**
ARCH1000	Introduction to Architectural Drafting	3
ARCH1006	Architectural Drafting I	3
ARCH1010	Architectural Drafting II	2
ARCH1015	Architectural Drafting III	3
ARCH1100	Architectural CAD: 2D AutoCAD	4
ARCH1201	Materials and Methods of Construction I	3
ARCH1205	Strength of Materials I	4
ARCH1210	Estimating I	2
ARCH1255	Planning Considerations	3
ARCH2120	Architectural Drafting IV	4
ARCH2140	Architectural Drafting V	4
ARCH2330	Architectural Presentation	3
ARCH2340	Design Development for Architectural Drafting	3
ARCH2465	Materials and Methods of Construction II	3
ARCH2480	Architectural Procedures	1
ARCH2560	Estimating II	3
ARCH2580	Strength of Materials II	3
MATH1000	Prealgebra	2

General Education Required		**12 Credits**
COMM2050	Interpersonal Communication	3
ENGL2120	Writing and Research	3
or		
ENGL2125	Technical Writing	3
PHIL2100	Critical Thinking	3
SSCI2100	Introduction to Sociology	3

General Education Elective **6 Credits**
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Technical Studies Elective **1 Credit**
Any ARCH course that is not required for this award may be used as an elective.

Total Associate in Applied Science Degree **72 Credits**

Diploma
Architectural Drafting and Design (BP/EP)

Overview
Architectural Drafting and Design Technicians prepare drawings by hand and with computer aided design (CAD) technology from rough sketches and specifications. A variety of other duties may be performed depending on the specialty of the employer and the nature of the position. The duties might consist of preparing construction drawings, researching of materials, equipment and codes, preparing material lists for bid, preparing shop drawings, estimating material and construction costs and verifying construction compliance.

Career Opportunities
Most opportunities for architectural drafting graduates are found in the construction industry. Job opportunities may be available in architectural and engineering offices, in the home construction industry, general contracting, production and manufacturing and sales of architectural products.

Technical Studies Required		**51 Credits**
ARCH1000	Introduction to Architectural Drafting	3
ARCH1006	Architectural Drafting I	3
ARCH1010	Architectural Drafting II	2
ARCH1015	Architectural Drafting III	3
ARCH1100	Architectural CAD: 2D AutoCAD	4
ARCH1201	Materials and Methods of Construction I	3

ARCH1205	Strength of Materials I	4
ARCH1210	Estimating I	2
ARCH1255	Planning Considerations	3
ARCH2120	Architectural Drafting IV	4
ARCH2140	Architectural Drafting V	4
ARCH2330	Architectural Presentation	3
ARCH2340	Design Development for Architectural Drafting	3
ARCH2465	Materials and Methods of Construction II	3
ARCH2480	Architectural Procedures	1
ARCH2560	Estimating II	3
ARCH2580	Strength of Materials II	3

General Education Required **4 Credits**

COMM1050	Communication in the Workplace	2
MATH1000	Prealgebra	2

General Education Elective **4 Credits**

Any HTC college level general education course may be used to satisfy the elective requirement.

Technical Studies Elective **5 Credits**

ARCH1105	Basic SoftPlan CAD	3
ARCH1225	Technical Drawing	1
ARCH1230	Sketching	1
ARCH1245	Surveying for Architectural Technicians	1
ARCH1900	Specialized Lab	1-4
ARCH2145	Remodel Drawing	4
ARCH2350	Architectural CAD: 3D AutoCAD	3
ARCH2360	Architectural CAD: Architectural Desktop (ADT)	4
ARCH2370	Architectural CAD: Revit	4
ARCH2640	Architectural Analysis	3
ARCH2710	Architectural Model Building	3

Total Diploma **64 Credits**

Cabinetmaking

Associate in Applied Science Degree Cabinetmaking (BP/EP)

Overview

Cabinetmakers perform hand and machine operations including cutting, shaping and assembly for the construction of store fixtures, office furniture, residential cabinetry, residential furniture and other articles of wood or related materials.

The Cabinetmaking program at Hennepin Technical College is divided into specific courses designed to introduce the many aspects of the cabinetmaking field. Emphasis will be placed on precision manufacturing, safety, traditional and computerized layout and design, blueprint reading and quality.

Career Opportunities

Graduates of this program choose careers in many different venues including residential cabinet shops, store fixture shops, furniture manufacturers, millwork shops and plastics industries. Some graduates operate their own businesses or shops.

Technical Studies Required **52 Credits**

CBTG1110	Basic Joinery	2
CBTG1120	Power Tool Operation	3
CBTG1130	Materials	1
CBTG1140	Basic Case Construction	3
CBTG1150	Drafting Techniques	2
CBTG1160	Basic Laminating	3
CBTG1210	Laminated Product Fabrication	3
CBTG1220	Blueprint Reading and Shop Drawings	3
CBTG1230	Wood Finishing	2
CBTG1250	Production Woodwork	4
CBTG2311	Cabinet Layout and Design	3
CBTG2320	Cabinet Joinery	3
CBTG2331	Cabinet Fabrication	4
CBTG2361	Frameless Cabinetry	4
CBTG2410	Furniture Design	2
CBTG2420	Furniture Joinery	3
CBTG2440	Computerized Cabinet Layout & Design	3
or		
CBTG2512	AutoCAD for Cabinetmaking	4
CBTG2450	Solid Surface Fabrication	2
MATH1000	Prealgebra	2

General Education Required **12 Credits**

ENGL2125	Technical Writing	3
METS1000	Computers in Manufacturing	3

One of these:

COMM2060	Small Group Communication	3
PHIL2100	Critical Thinking	3

One of these:

SSCI2100	Introduction to Sociology	3
SSCI2200	Principles of Microeconomics	3
SSCI2300	General Psychology	3

General Education Elective **6 Credits**

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Technical Studies Elective		**2 Credits**
CBTG1240	Millroom Operations	2
CBTG1900	Specialized Lab	1-4
CBTG2430	Furniture Fabrication	4
CBTG2440	Computerized Cabinet Layout and Design	3
CBTG2512	AutoCAD for Cabinetmaking	4
CBTG2522	CAM Programming for CNC Woodworking Routers	3
CBTG2532	Programming and Operation of CNC Woodworking Routers	3

Total Associate in Applied Science Degree **72 Credits**

Diploma
Cabinetmaking (BP/EP)

Overview

Cabinetmakers perform hand and machine operations including cutting, shaping and assembly for the construction of store fixtures, office furniture, residential cabinetry, residential furniture and other articles of wood or related materials.

The Cabinetmaking program at Hennepin Technical College is divided into specific courses designed to introduce the many aspects of the cabinetmaking field. Emphasis will be placed on precision manufacturing, safety, traditional and computerized layout and design, blueprint reading and quality.

Career Opportunities

Graduates of this program choose careers in many different venues including residential cabinet shops, store fixture shops, furniture manufacturers, millwork shops and plastics industries. Some graduates operate their own businesses or shops.

Technical Studies Required		**50 Credits**
CBTG1110	Basic Joinery	2
CBTG1120	Power Tool Operation	3
CBTG1130	Materials	1
CBTG1140	Basic Case Construction	3
CBTG1150	Drafting Techniques	2
CBTG1160	Basic Laminating	3
CBTG1210	Laminated Product Fabrication	3
CBTG1220	Blueprint Reading and Shop Drawings	3
CBTG1230	Wood Finishing	2
CBTG1250	Production Woodwork	4
CBTG2311	Cabinet Layout and Design	3
CBTG2320	Cabinet Joinery	3
CBTG2331	Cabinet Fabrication	4
CBTG2361	Frameless Cabinetry	4
CBTG2410	Furniture Design	2
CBTG2420	Furniture Joinery	3
CBTG2440	Computerized Cabinet Layout and Design	3
or		
CBTG2512	AutoCAD for Cabinetmaking	4
CBTG2450	Solid Surface Fabrication	2

General Education Required		**6 Credits**
MATH1000	Prealgebra	2
METS1000	Computers in Manufacturing	3
SSCI1000	Introduction to Environmental Health and Safety	1

General Education Elective **2 Credits**

Any HTC college level general education course may be used to satisfy the elective requirement.

Technical Studies Elective		**6 Credits**
CBTG1240	Millroom Operations	2
CBTG1900	Specialized Lab	1-4
CBTG2430	Furniture Fabrication	4
CBTG2440	Computerized Cabinet Layout and Design	3
CBTG2512	AutoCAD for Cabinetmaking	4
CBTG2522	CAM Programming for CNC Woodworking Routers	3
CBTG2532	Programming and Operation of CNC Woodworking Routers	3

Total Diploma **64 Credits**

Advanced Technical Certificate
CNC Machining for Wood and Plastics (BP)

Overview

The certificate focuses on training individuals in the operation of numerical controlled equipment used for machining wood, plastic and related material.

Participants will refine skills in creating geometry for component parts using AutoCAD. Manual numerical code generation will be taught to reinforce machine manipulation and program knowledge. Computer Aided Machining (CAM) numerical code generation will be accomplished using Router-CIM software. Basic fixturing, controller manipulation, maintenance, tooling and hands on part manufacturing will be accomplished using KOMO 408 CNC router.

Career Opportunities

This certificate program prepares individuals to enter the wood and plastics CNC machining industry. The student will gain experience preparing parts drawings, generating machine code and operating a CNC router. This training may lead to entry-level employment in this very exciting and challenging field.

Technical Studies Required		**10 Credits**
CBTG2512	AutoCAD for Cabinetmaking	4
CBTG2522	CAM Programming for CNC Woodworking Routers	3
CBTG2532	Programming and Operation of CNC Woodworking Routers	3
Total Advanced Technical Certificate		**10 Credits**

Carpentry

Diploma
Carpentry (BP/EP)

Overview

Carpenters construct, install, erect and repair structures to comply with all existing codes and in a manner that exhibits skill and craftsmanship. They read blueprints, sketches and specifications for information pertaining to dimensions, types of materials required and standards of work. Carpenters work with a variety of hand tools, power tools and equipment. They work in a variety of physically demanding situations including weather extremes, heights and enclosed areas. A carpenter may be skilled in framing, interior and exterior finishing, forming and/or remodeling of residential and commercial buildings.

Career Opportunities

A person who has carpenter training may be an all around carpenter or may specialize in areas such as framer, interior finisher, sider, shingler, drywall installer, acoustical ceiling installer, maintenance carpenter, millwright, bridge builder or prefabrication production builder. A carpenter may advance to the position of crew supervisor or job superintendent. Carpenters may go into business for themselves and become contractors for new construction or remodeling work. They may also go into related fields of work such as sales, lumber yard management, building inspection or factory representative.

Technical Studies Required		**26 Credits**
CARP1111	Floor and Wall Framing	5
CARP1140	Engineered Roof Systems	2
CARP1180	Stair Framing	2
CARP1210	Residential Roof Coverings	1
CARP1220	Siding	2
CARP1230	Cornice	1
CARP1511	Insulation and Drywall	3
CARP1710	Stair Finishing	2
CARP1720	Interior Trim	4
CARP1810	Residential Blueprint Reading	1
CARP1820	Residential Estimating	2
CARP1830	Building Code	1
General Education Required		**4 Credits**
COMM1040	Job Seeking Skills	2
or		
CPLT1060	Internet Quick Start	1
and		
SSCI1020	CPR/First Aid	1
MATH1000	Prealgebra	2
Technical Studies Elective		**6 Credits**
CARP1100	Introduction to Residential Construction	1
CARP1130	Additions and Retrofit	2
CARP1150	Rafter Framing	3
CARP1190	Deck Construction	1
CARP1420	Concrete Stairs, Walks and Drives	1
CARP1430	Install Concrete Slabs	1
CARP1760	Cabinet Making	3
CARP1840	Energy Efficient Construction	1
CARP1850	Introduction to Computer Assisted Drawing	1
CARP1900	Specialized Lab	1-4
Total Diploma		**36 Credits**

Gas Utility Technology

Diploma
Gas Utility Technology (BP)

Overview

This program prepares students to install, maintain and operate natural gas distribution systems used to supply natural gas to residential, commercial and industrial customers. Utility companies, such as Minnegasco and contractors, may provide scholarships to students who qualify equal. Graduates hired by some of these companies may be reimbursed for part of their tuition investment. Students will be able to: Communicate technical information, operate tools and equipment, join pipe, install natural gas distribution systems, apply customer service skills, maintain gas distribution systems, operate pipeline excavation equipment, and recognize hazards associated with natural gas. Students should obtain a Commercial Drivers License Permit prior to graduation.

Career Opportunities

Employment opportunities in the gas utility field are excellent. Positions include: Gas construction mechanic, gas service mechanic, underground facilities locator.

Technical Studies Required		**30 Credits**
GTEC1111	Characteristics of Natural Gas	5
GTEC1121	Leak Classification	5
GTEC1130	Leak Investigation	4
GTEC1201	Gas Appliances/Electricity	2
GTEC1210	Pipe Joining, Excavation and Shoring	4
GTEC1221	Installing Mains and Services	5
GTEC1231	Regulation	5
General Education Required		**6 Credits**
COMM1050	Communication in the Workplace	2
CPLT1000	Computer Keyboarding	2
MATH1000	Prealgebra	2
Total Diploma		**36 Credits**

Heating, Ventilation, Air Conditioning and Refrigeration

Associate in Applied Science Degree
Heating, Ventilation, Air Conditioning, and Refrigeration (BP/EP)

Overview

Trained personnel are in critical short supply for the demands of the residential and commercial heating and air conditioning industry. With the increased need for energy efficient heating and cooling systems, new energy codes and exploding technology advancements, opportunities in the residential/commercial HVAC field are unlimited. The residential/commercial air conditioning, heating and refrigeration areas include working on heat/cool rooftop units, high-efficiency electronically controlled forced air furnaces and hydronic boilers, chillers and large-building computerized energy management control systems, ice cube machines, walk-in coolers/freezers and display cases. The HVAC technician should have the ability to install, retrofit, service and repair residential/commercial air handling units that have the capabilities of cooling, heating, humidifying, dehumidifying and filtration of air for environmental control.

Career Opportunities

Employment opportunities in the residential/commercial heating, cooling, air conditioning and refrigeration field are based on each individual's goals and qualifications. Opportunities exist in management, sales, service, installation and maintenance of HVAC and refrigeration equipment. Possible positions include: installer, quality control technician, service technician, manufacturer's representative, sales consultant, layout person and designer. In addition, the A.A.S. degree will help qualify individuals for management positions in the sales, installation, and service of HVAC equipment.

Technical Studies Required		**53 Credits**
HVAC1000	Electrical Circuits	3
HVAC1010	1PH Motors and Auxiliary Controls	2
HVAC1020	Tube and Pipe Fabrication	2
HVAC1030	Sheet Metal	2
HVAC1040	Basic Refrigeration	4
HVAC1050	Refrigerant Transition and Recovery	1
HVAC1070	Gas Heat Systems	3
HVAC1110	Electrical Diagrams	2
HVAC1130	Room Air Conditioners	2
HVAC1140	Central Air Conditioners	3
HVAC1150	Hydronic Heat Systems	1
HVAC1180	MN Special Boilers License	1
HVAC2001	Packaged Heating and Cooling Equipment	4
HVAC2010	Heat Pump Systems	2
HVAC2020	Pneumatic Controls	2
HVAC2030	Commercial Ice Making Machines	3
HVAC2041	Gas/Refrigeration (Mechanical) Code	1
HVAC2050	Electrical for Commercial HVAC&R Equipment	2
HVAC2100	Water Chiller Machines	3
HVAC2111	Low Pressure Steam and Water Boilers	2
HVAC2120	Refrigerated Coolers and Cases	3
HVAC2130	Supermarket Refrigeration	3
MATH1000	Prealgebra	2

General Education Required		**12 Credits**
COMM2050	Interpersonal Communication	3
METS1000	Computers in Manufacturing	3
SSCI2100	Introduction to Sociology	3
PHIL2100	Critical Thinking	3

General Education Elective **6 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective		**1 Credit**
HVAC1081	Oil Heat Systems	1
HVAC1120	Psychrometrics	1
HVAC1155	Radiant Heat Systems	1
HVAC1160	Air Quality Systems	1
HVAC2060	Computer Room Air Conditioning	1
HVAC2140	Absorption Chillers	1
HVAC2150	Energy Management	2
HVAC2160	Refrigeration Service I	1
HVAC2165	Heat Recovery Ventilators	1

Total Associate in Applied Science Degree **72 Credits**

Diploma
Residential Heating, Ventilating and Air Conditioning (BP/EP)

Overview

Trained, highly skilled personnel are needed for the exciting new technological demands of the residential heating, ventilation and air conditioning industry. Independent and critical thinking men and women instilled with troubleshooting and electrical control circuit skills are vital for the future installation and servicing of residential HVAC equipment. Prospective technicians will also master the intricacies of the newest residential energy management controls and indoor air quality equipment.

Career Opportunities

Employment is available in management, sales, service and the installation and maintenance of residential HVAC equipment. Qualified graduates can be employed as installers, quality control technicians, service technicians, manufacturer's representatives, sales consultants, layout persons, and designers.

Technical Studies Required		**27 Credits**
HVAC1000	Electrical Circuits	3
HVAC1010	1PH Motors and Auxiliary Controls	2
HVAC1020	Tube and Pipe Fabrication	2
HVAC1030	Sheet Metal	2
HVAC1040	Basic Refrigeration	4
HVAC1050	Refrigerant Transition and Recovery	1
HVAC1070	Gas Heat Systems	3
HVAC1110	Electrical Diagrams	2
HVAC1130	Room Air Conditioners	2
HVAC1140	Central Air Conditioners	3
HVAC1145	Heat Pumps	1
HVAC1150	Hydronic Heat Systems	1
HVAC1180	MN Special Boilers License	1
General Education Required		**5 Credits**
MATH1000	Prealgebra	2
METS1000	Computers in Manufacturing	3
Technical Studies Elective		**1 Credit**
HVAC1081	Oil Heat Systems	1
HVAC1120	Psychrometrics	1
HVAC1155	Radiant Heat Systems	1
HVAC1160	Air Quality Systems	1
HVAC2165	Heat Recovery Ventilators	1
Total Diploma		**33 Credits**

Diploma
Commercial Heating, Ventilating, Air Conditioning and Refrigeration (EP)

Overview

With the increased need for energy efficient heating and cooling systems, opportunities in the commercial refrigeration field are unlimited. Work in the area of supermarket refrigeration contains perhaps one of the biggest challenges and requires intensive quality training. Ice cube machines, walk-in coolers and display cases require technical service skills. The air conditioning and heating areas include working on heat/cool rooftop units, chillers and large building systems that are controlled by electronic, electric or pneumatic systems. The technician should also have the ability to install and maintain large air handling units which have the capabilities of cooling, heating, humidifying, dehumidifying and cleaning air for human and equipment environmental control. Increasing energy costs have created a great demand for skilled technicians in the area of energy management systems.

Prerequisite: Successful completion of the Residential Heating, Ventilation and Air Conditioning program or life experience is a prerequisite of acceptance in the HVAC program.

Career Opportunities

Employment opportunities in the commercial heating, air conditioning and refrigeration field are based on each person's goals and qualifications. Manufacturing, installation, servicing and engineering firms could employ an individual. Possible positions include: installer, quality control technician, service technician, layout person and designer.

Technical Studies Required		**25 Credits**
HVAC2001	Packaged Heating and Cooling Equipment	4
HVAC2010	Heat Pump Systems	2
HVAC2020	Pneumatic Controls	2
HVAC2030	Commercial Ice Making Machines	3
HVAC2041	Gas/Refrigeration (Mechanical) Code	1
HVAC2050	Electrical for Commercial HVAC&R Equipment	2
HVAC2100	Water Chiller Machines	3
HVAC2111	Low Pressure Steam and Water Boilers	2
HVAC2120	Refrigerated Coolers and Cases	3
HVAC2130	Supermarket Refrigeration	3
General Education Required		**2 Credits**
COMM1016	Teambuilding in the Workplace	2
or		
COMM1040	Job Seeking Skills	2
or		
COMM1050	Communication in the Workplace	2
or		
ENGL1025	Essentials of Technical Writing	2
General Education Elective		**2 Credits**

Any HTC college level general education course may be used to satisfy the elective requirement.

Technical Studies Elective **3 Credits**

Any HVAC course not required for this award may be used as an elective.

Total Diploma **32 Credits**

Advanced Technical Certificate
Commercial Refrigeration (EP)

Overview

This certificate provides specialized training in the commercial refrigeration field. The certificate is designed for persons who desire specialized training in the servicing and troubleshooting of ice making machines, walk-in coolers and supermarket refrigeration. The mechanical and electrical will be covered.

Career Opportunities

This certificate is designed for persons with experience in building maintenance and desire training in this area.

Technical Studies Required		**11 Credits**
HVAC2030	Commercial Ice Making Machines	3
HVAC2050	Electrical for Commercial HVAC&R Equipment	2
HVAC2120	Refrigerated Coolers and Cases	3
HVAC2130	Supermarket Refrigeration	3
Total Advanced Technical Certificate		**11 Credits**

Advanced Technical Certificate Commercial Heating and Air Conditioning Equipment (EP)

Overview
This certificate provides specialized training in the heating and air conditioning systems used in commercial buildings. The certificate is designed for persons who desire specialized training in the servicing and troubleshooting of this light commercial equipment. The mechanical, electrical and airflow systems of this equipment will be covered.

Prerequisite: This certificate is designed for persons who have experience in commercial building maintenance and desire specialized training in the servicing and troubleshooting of this light commercial equipment.

Career Opportunities
This certificate is designed for persons who have experience in commercial building maintenance and desire specialized training in the servicing and troubleshooting of this light commercial equipment.

Technical Studies Required		**10 Credits**
HVAC2001	Packaged Heating and Cooling Equipment	4
HVAC2010	Heat Pump Systems	2
HVAC2041	Gas/Refrigeration (Mechanical) Code	1
HVAC2050	Electrical for Commercial HVAC&R Equipment	2
HVAC2060	Computer Room Air Conditioning	1
Total Advanced Technical Certificate		**10 Credits**

Occupational Certificate Building Service/Maintenance (EP)

Overview
This certificate provides specialized training in the operation of heating and cooling for commercial properties. The certificate is designed for persons who desire specialized or updated training in the operation, troubleshooting and repair of chillers and low-pressure steam boilers. The programming and installation of building automation systems is also covered.

Career Opportunities
This certificate is designed to assist maintenance persons who work in hotels and office buildings with restaurants.

Technical Studies Required		**10 Credits**
HVAC2050	Electrical for Commercial HVAC&R Equipment	2
HVAC2100	Water Chiller Machines	3
HVAC2111	Low Pressure Steam and Water Boilers	2
HVAC2140	Absorption Chillers	1
HVAC2150	Energy Management	2
Technical Studies Elective		**1 Credit**

Any HVAC course not required for this award may be used as an elective.

Total Occupational Certificate 11 Credits

Industrial Building Engineering and Maintenance

Diploma Industrial Building Engineering and Maintenance (BP)

Overview
The Industrial Building Engineering and Maintenance diploma provides students with a multi-discipline education in building and machine maintenance technologies. This program will educate the student in various aspects of boiler operation, maintenance carpentry, heating and cooling applications, hydraulic and pneumatic components, industrial electrical and motor control systems, machine-tool processes, welding, fluid conductor application, CAD operation, machine repair and troubleshooting practices.

Career Opportunities
The maintenance field is one that offers consistence and long term employment opportunities. The maintenance of buildings and machines is a vital and ever-present task at all industrial facilities. Career opportunities exist in small and large companies and employment can be found in local as well as in the national markets. The maintenance technician will find jobs that include any or all of these duties: repair and maintenance of the inside and outside of the facility, carpentry, boiler operation, the preservation of heating and air conditioning systems, upkeep of material handling equipment and preventative maintenance and repair of manufacturing machines and related equipment.

Technical Studies Required		**39 Credits**
ENGC1100	AutoCAD I	4
FLPW1101	Fluid Power Technology I	3
FLPW1150	Pneumatic Components	4
FLPW1231	Industrial Electricity I	3
FLPW1236	Industrial Electricity II	3
FLPW2000	Programmable Logic Controllers	3
HVAC1180	MN Special Boilers License	1
IBEM1000	Welding Maintenance	3
IBEM1010	Carpentry Maintenance	3
IBEM1020	HVAC Maintenance	3
IBEM1030	Tube and Pipe Repair	2
IBEM1040	Rigging Procedures and Forklift Operations	1
MACH1056	Blueprint Reading I	3
MACH1205	Machine Tool Technology	3
General Education Required		**5 Credits**
MATH1000	Prealgebra	2
METS1000	Computers in Manufacturing	3
Total Diploma		**44 Credits**

Floral & Landscape
CAREERS

Floral (Retail)

Diploma	Professional Florist (BP)	34 Credits	Page 54
Occupational Certificate	Floral Designer (BP)	21 Credits	Page 54

Landscape Careers

Associate in Applied Science Degree	Landscape Design and Construction (BP)	72 Credits	Page 55
Associate in Applied Science Degree	Landscape/Horticulture (BP)	72 Credits	Page 56
Diploma	Landscape/Horticulture (BP)	64 Credits	Page 56
Diploma	Landscape Design and Construction (BP)	64 Credits	Page 57
Diploma	Greenhouse Technician (BP)	32 Credits	Page 58
Advanced Technical Certificate	Landscape Construction (BP)	20 Credits	Page 58
Occupational Certificate	Arboriculture (BP)	19 Credits	Page 58

Floral & Landscape
CAREERS

Floral (Retail)

Diploma
Professional Florist (BP)

Overview

A Professional Florist is a person who has trained in beginning as well as advanced levels of all floral shop operations. That training is necessary for those individuals who wish to be at an advanced level of competence and who wish to own or operate their own flower shop at some point in their career.

Skill development includes training in basic, advanced and contemporary design, flower shop operations, selling merchandise, floral software and computer operations, as well as advanced wedding and funeral design training. Many other duties include caring for foliage and flowering plants, processing cut flowers and foliages and taking orders both over the phone and in person.

To be a Professional Florist a person must have special personal qualities. Some of these qualities include the ability to work well with others, the desire to be part of a team, manual dexterity, good communication skills, the ability to be a self-starter and the desire to help others. Many orders are general in nature and it is up to the Professional Florist to assist the customer in selecting the appropriate colors and types of flowers and plants to express the desired sentiment.

Career Opportunities

Trained Professional Florists are in high demand and career opportunities are very good for well prepared individuals. Professional Florists are employed by full service florists, mass market florists, wholesale florist suppliers and as manufacturer reps. With ability, design creativity and professional business management skills, individuals can develop their own business as a very profitable venture. Many full service flower shops in Minnesota are owned or managed by former students of the Retail Floral program.

Technical Studies Required		**28 Credits**
RTFL1100	Fresh Cut Flower/Foliage Care, Handling and Identification	2
RTFL1111	Foliage and Flowering Plant Care, Handling and Identification	2
RTFL1200	Fresh Flower Design I	2
RTFL1210	Fresh Flower Design II	2
RTFL1220	Contemporary Fresh Flower Design	2
RTFL1230	Special Occasion/Party Design	2
RTFL1300	Permanent Flower and Foliage Design	2
RTFL1410	Flower Shop Operation	2
RTFL1421	Internship	3
RTFL1430	Entrepreneurship in the Floral Industry	2
RTFL1500	Funeral Design	2
RTFL1600	Personal Flowers to Wear	2
RTFL1610	Wedding Design	3

General Education Elective **4 Credits**

Any HTC college level general education course may be used to satisfy the elective requirement.

Technical Studies Elective		**2 Credits**
RTFL1510	Advanced Funeral Design	1
RTFL1620	Advanced Wedding Design	1
RTFL1900	Specialized Lab	1-4

Total Diploma **34 Credits**

Occupational Certificate
Floral Designer (BP)

Overview

A Floral Designer is a person who has trained in only the beginning levels of floral shop operations. This training is necessary for those individuals who wish to work as an entry-level designer.

Skill development includes training in basic design, flower shop operations and overview, as well as basic wedding and funeral design training. Other duties may include caring for foliage and flowering plants and processing cut flowers and foliages.

To be a Floral Designer a person must have special personal qualities. Some of these qualities include the ability to work well with others, the desire to be part of a team, manual dexterity, good communication skills and the willingness and ability to take directions.

Career Opportunities

Trained Floral Designers are employed by full service florists, mass market florists and wholesale florist suppliers. Many full service flower shops in Minnesota that are owned or managed by former students of the Retail Floral program hire basic floral designers from the Retail Floral program.

Technical Studies Required		21 Credits
RTFL1100	Fresh Cut Flower/Foliage Care, Handling and Identification	2
RTFL1111	Foliage and Flowering Plant Care, Handling and Identification	2
RTFL1200	Fresh Flower Design I	2
RTFL1210	Fresh Flower Design II	2
RTFL1230	Special Occasion/Party Design	2
RTFL1300	Permanent Flower and Foliage Design	2
RTFL1430	Entrepreneurship in the Floral Industry	2
RTFL1500	Funeral Design	2
RTFL1600	Personal Flowers to Wear	2
RTFL1610	Wedding Design	3
Total Occupational Certificate		**21 Credits**

Landscape Careers

Associate in Applied Science Degree Landscape Design and Construction (BP)

Overview

This program of study leading to a degree gives the student a basic landscape/horticulture education the first year. The second year focuses on landscape design and landscape construction. The design area will include courses in drafting and graphics, residential design, estimating, presentation techniques and computer drafting. The construction area includes courses in blue-print reading, estimating, surveying, landscape installation and specialized hardscape construction.

Career Opportunities

Students completing this area of study will have employment options as landscape designers or construction specialists with design/build firms or landscape construction businesses.

Technical Studies Required		49 Credits
LNDC1110	Introduction to Landscape/Horticulture	1
LNDC1120	Landscape Plants - Trees	4
LNDC1151	Insects and Diseases of Landscape Plants	3
LNDC1190	Landscape Plants - Shrubs	4
LNDC1201	Herbaceous Plants I	3
LNDC1231	Nursery Operations	2
LNDC1235	Landscape Operations	2
LNDC1241	Plant Biology	3
LNDC1271	Soil Science	3
LNDC2110	Introduction to Landscape Construction	2
LNDC2120	Landscape Construction I	4
LNDC2130	Landscape Construction II	4
LNDC2160	Landscape Design I	4
LNDC2170	Landscape Design II	4
LNDC2240	Landscape Equipment Operation	4
MATH1000	Prealgebra	2

General Education Required		15 Credits
COMM2050	Interpersonal Communication	3
CPLT1100	Introduction to Personal Computers	3
ENGL2120	Writing and Research	3
PHIL2100	Critical Thinking	3
SSCI2100	Introduction to Sociology	3

General Education Elective **3 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective		5 Credits
LNDC1130	Arboriculture I	2
LNDC1140	Nursery Propagation and Production	2
LNDC1210	Herbaceous Plants II	2
LNDC1220	Integrated Pest Management	2
LNDC1900	Specialized Lab	1-4
LNDC2100	Landscape Supervision	1
LNDC2150	Advanced Arboriculture	2
LNDC2180	Design Flower Beds	2
LNDC2190	Advance Design/Sales	2
LNDC2210	Interior Foliage Plants	2
LNDC2220	Turf Grass Culture and Maintenance	3
LNDC2230	Turf Pest Management	2
LNDC2250	Landscape Management	2
LNDC2271	LandCADD Design I	3
LNDC2280	LandCADD Design II	3
LNDC2335	Landscape Construction Internship	1-4
LNDC2345	Arboriculture Internship	1-4
Total Associate in Applied Science Degree		**72 Credits**

Associate in Applied Science Degree Landscape/Horticulture (BP)

Overview

This program of study leading to a degree in Landscaping concentrates on the multi-faceted career opportunities available in the landscape horticulture industry. Students will study a variety of required subjects and elective courses allowing them to customize their program. This is an excellent general program leading to varied opportunities in the landscape industry.

Career Opportunities

Employment options include nursery production, grounds care, retail and wholesale sales, interior landscaping, landscape installation and many specialized areas such as garden design and as municipal tree inspectors.

Technical Studies Required		**45 Credits**
LNDC1110	Introduction to Landscape/Horticulture	1
LNDC1120	Landscape Plants - Trees	4
LNDC1130	Arboriculture I	2
LNDC1140	Nursery Propagation and Production	2
LNDC1151	Insects and Diseases of Landscape Plants	3
LNDC1190	Landscape Plants - Shrubs	4
LNDC1201	Herbaceous Plants I	3
LNDC1220	Integrated Pest Management	2
LNDC1231	Nursery Operations	2
LNDC1235	Landscape Operations	2
LNDC1241	Plant Biology	3
LNDC1250	Bedding Plant Production	3
LNDC1271	Soil Science	3
LNDC2220	Turf Grass Culture and Maintenance	3
LNDC2240	Landscape Equipment Operation	4
LNDC2260	Professional Gardening	2
MATH1000	Prealgebra	2

General Education Required		**15 Credits**
COMM2050	Interpersonal Communication	3
CPLT1100	Introduction to Personal Computers	3
ENGL2120	Writing and Research	3
PHIL2100	Critical Thinking	3
SSCI2100	Introduction to Sociology	3

General Education Elective **3 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective		**9 Credits**
LNDC1160	Greenhouse Operation and Management	2
LNDC1166	Greenhouse Crops - Fall	3
LNDC1176	Greenhouse Crops - Winter	3
LNDC1210	Herbaceous Plants II	2
LNDC1900	Specialized Lab	1-4
LNDC2100	Landscape Supervision	1
LNDC2110	Introduction to Landscape Construction	2
LNDC2120	Landscape Construction I	4
LNDC2130	Landscape Construction II	4
LNDC2150	Advanced Arboriculture	2
LNDC2160	Landscape Design I	4
LNDC2180	Design Flower Beds	2
LNDC2210	Interior Foliage Plants	2
LNDC2230	Turf Pest Management	2
LNDC2250	Landscape Management	2
LNDC2335	Landscape Construction Internship	1-4
LNDC2345	Arboriculture Internship	1-4
LNDC2350	Grounds Maintenance Internship	1-4
LNDC2360	Horticulture Internship	1-4
RTFL1100	Fresh Cut Flower/Foliage Care, Handling and Identification	2
RTFL1111	Foliage and Flowering Plant Care, Handling and Identification	2
RTFL1200	Fresh Flower Design I	2

Total Associate in Applied Science Degree **72 Credits**

Diploma Landscape/Horticulture (BP)

Overview

This program of study leading to a diploma in Landscaping concentrates on the multi-faceted career opportunities available in the landscape horticulture industry. Students will study a variety of required subjects and elective courses allowing them to customize their program. This is an excellent general program leading to varied opportunities in the landscape industry.

Career Opportunities

Employment options include nursery production, grounds care, retail and wholesale sales, interior landscaping, landscape installation and many specialized areas such as garden design and as municipal tree inspectors.

Technical Studies Required		**43 Credits**
LNDC1110	Introduction to Landscape/Horticulture	1
LNDC1120	Landscape Plants - Trees	4
LNDC1130	Arboriculture I	2
LNDC1140	Nursery Propagation and Production	2
LNDC1151	Insects and Diseases of Landscape Plants	3
LNDC1190	Landscape Plants - Shrubs	4
LNDC1201	Herbaceous Plants I	3
LNDC1220	Integrated Pest Management	2
LNDC1231	Nursery Operations	2
LNDC1235	Landscape Operations	2
LNDC1241	Plant Biology	3
LNDC1250	Bedding Plant Production	3
LNDC1271	Soil Science	3
LNDC2220	Turf Grass Culture and Maintenance	3
LNDC2240	Landscape Equipment Operation	4
LNDC2260	Professional Gardening	2

General Education Required		4 Credits
COMM1050	Communication in the Workplace	2
MATH1000	Prealgebra	2

General Education Elective **4 Credits**

Any HTC college level general education course may be used to satisfy the elective requirement.

Technical Studies Elective		13 Credits
LNDC1160	Greenhouse Operation and Management	2
LNDC1166	Greenhouse Crops - Fall	3
LNDC1176	Greenhouse Crops - Winter	3
LNDC1210	Herbaceous Plants II	2
LNDC1900	Specialized Lab	1-4
LNDC2100	Landscape Supervision	1
LNDC2110	Introduction to Landscape Construction	2
LNDC2120	Landscape Construction I	4
LNDC2130	Landscape Construction II	4
LNDC2150	Advanced Arboriculture	2
LNDC2160	Landscape Design I	4
LNDC2180	Design Flower Beds	2
LNDC2210	Interior Foliage Plants	2
LNDC2230	Turf Pest Management	2
LNDC2250	Landscape Management	2
LNDC2260	Professional Gardening	2
LNDC2335	Landscape Construction Internship	1-4
LNDC2345	Arboriculture Internship	1-4
LNDC2350	Grounds Maintenance Internship	1-4
LNDC2360	Horticulture Internship	1-4
RTFL1100	Fresh Cut Flower/Foliage Care, Handling and Identification	2
RTFL1111	Foliage and Flowering Plant Care, Handling and Identification	2
RTFL1200	Fresh Flower Design I	2
Total Diploma		**64 Credits**

Diploma
Landscape Design and Construction (BP)

Overview

This program of study leading to a diploma gives the student a basic landscape/horticulture education the first year. The second year focuses on landscape design and landscape construction. The design area will include courses in drafting and graphics, residential design, estimating, presentation techniques and computer drafting. The construction area includes courses in blue print reading, estimating, surveying, landscape installation and specialized hardscape construction.

Career Opportunities

Students completing this area of study will have employment options as landscape designers or construction specialists with design/build firms or landscape construction businesses.

Technical Studies Required		47 Credits
LNDC1110	Introduction to Landscape/Horticulture	1
LNDC1120	Landscape Plants - Trees	4
LNDC1151	Insects and Diseases of Landscape Plants	3
LNDC1190	Landscape Plants - Shrubs	4
LNDC1201	Herbaceous Plants I	3
LNDC1231	Nursery Operations	2
LNDC1235	Landscape Operations	2
LNDC1241	Plant Biology	3
LNDC1271	Soil Science	3
LNDC2110	Introduction to Landscape Construction	2
LNDC2120	Landscape Construction I	4
LNDC2130	Landscape Construction II	4
LNDC2160	Landscape Design I	4
LNDC2170	Landscape Design II	4
LNDC2240	Landscape Equipment Operation	4

General Education Required		4 Credits
COMM1050	Communication in the Workplace	2
MATH1000	Prealgebra	2

General Education Elective **4 Credits**

Any HTC college level general education course may be used to satisfy the elective requirement.

Technical Studies Elective		9 Credits
LNDC1130	Arboriculture I	2
LNDC1140	Nursery Propagation and Production	2
LNDC1210	Herbaceous Plants II	2
LNDC1220	Integrated Pest Management	2
LNDC1990	Environmental Horticulture	1-3
LNDC2100	Landscape Supervision	1
LNDC2150	Advanced Arboriculture	2
LNDC2180	Design Flower Beds	2
LNDC2190	Advance Design/Sales	2
LNDC2210	Interior Foliage Plants	2
LNDC2220	Turf Grass Culture and Maintenance	3
LNDC2230	Turf Pest Management	2
LNDC2250	Landscape Management	2
LNDC2260	Professional Gardening	2
LNDC2271	LandCADD Design I	3
LNDC2280	LandCADD Design II	3
LNDC2335	Landscape Construction Internship	1-4
LNDC2345	Arboriculture Internship	1-4
Total Diploma		**64 Credits**

Diploma
Greenhouse Technician (BP)

Overview
This program of study is for the student seeking a career in the plant production industry. Courses focus on the green plant industry and may also be applied to many aspects of nursery crop production as well. Students will utilize the program greenhouses for the many production/growing laboratory projects.

Career Opportunities
Students completing this area of study may be employed as growing technicians, greenhouse managers or plant production specialists.

Technical Studies Required		**20 Credits**
LNDC1110	Introduction to Landscape/Horticulture	1
LNDC1160	Greenhouse Operation and Management	2
LNDC1166	Greenhouse Crops - Fall	3
LNDC1176	Greenhouse Crops - Winter	3
LNDC1220	Integrated Pest Management	2
LNDC1241	Plant Biology	3
LNDC1250	Bedding Plant Production	3
LNDC1271	Soil Science	3
General Education Required		**4 Credits**
COMM1050	Communication in the Workplace	2
MATH1000	Prealgebra	2
Technical Studies Elective		**8 Credits**
LNDC1120	Landscape Plants - Trees	4
LNDC1140	Nursery Propagation and Production	2
LNDC1151	Insects and Diseases of Landscape Plants	3
LNDC1190	Landscape Plants - Shrubs	4
LNDC1201	Herbaceous Plants I	3
LNDC1900	Specialized Lab	1-4
LNDC2210	Interior Foliage Plants	2
LNDC2250	Landscape Management	2
LNDC2260	Professional Gardening	2
LNDC2360	Horticulture Internship	1-4
RTFL1100	Fresh Cut Flower/Foliage Care, Handling and Identification	2
RTFL1111	Foliage and Flowering Plant Care, Handling and Identification	2
RTFL1200	Fresh Flower Design I	2
Total Diploma		**32 Credits**

Advanced Technical Certificate
Landscape Construction (BP)

Overview
This program of study leading to a certificate in landscape construction provides the student with specific courses, each focusing on an individual aspect of landscape construction. Included are decks, fences, retaining walls, patios, construction specifications, estimating and job planning. There is extensive lab time for field projects.

Prerequisite: A minimum of one year experience in the landscape industry.

Career Opportunities
Completion of the construction certificate will lead directly to opportunities with landscape construction and design building firms.

Technical Studies Required		**20 Credits**
LNDC1235	Landscape Operations	2
LNDC2110	Introduction to Landscape Construction	2
LNDC2120	Landscape Construction I	4
LNDC2130	Landscape Construction II	4
LNDC2240	Landscape Equipment Operation	4
LNDC2330	Landscape Construction Internship Certificate	4
Total Advanced Technical Certificate		**20 Credits**

Occupational Certificate
Arboriculture (BP)

Overview
This specialized area of study leads to a certificate in arboriculture. Arboriculture is the study of and care of trees and other landscape woody plants. The students will study plant materials, insects, diseases and environmental problems affecting woody plants of the upper midwest. This course of study will also include courses relating to maintenance practices necessary to insure the health and beauty of woody plants in the landscape. Students will have the opportunity to develop field skills in rope and saddle trimming work.

Career Opportunities
Students completing the arboriculture certificate may be employed in the tree service industry, park systems and ground maintenance businesses.

Technical Studies Required		**19 Credits**
LNDC1120	Landscape Plants - Trees	4
LNDC1130	Arboriculture I	2
LNDC1151	Insects and Diseases of Landscape Plants	3
LNDC1190	Landscape Plants - Shrubs	4
LNDC2150	Advanced Arboriculture	2
LNDC2340	Arboriculture Internship Certificate	4
Total Occupational Certificate		**19 Credits**

Health CAREERS

Dental Careers

Associate in Applied Science Degree
Dental Assistant (BP/EP)

Overview

The Dental Assistant is an important member of a professional health team. As a Dental Assistant, you will perform many duties at chairside, assisting the dentist during patient treatment and completion of records. The assistant must also be skilled in related office tasks and procedures including appointment scheduling and telephone communications as well as laboratory procedures. A Registered Dental Assistant is able to perform all expanded duties authorized by the MN State Board of Dentistry. Several of these duties are taking radiographs (x-rays), polishing teeth, placing pit and fissure sealants, taking impressions, performing orthodontic procedures, placement and removal of rubber dams and removal of sutures and surgical dressings.

Personal qualities considered essential for this occupation are the ability to work well with others, the desire to be a part of a professional team, manual dexterity, good communication skills, ability to follow direct supervision and to be sensitive to others' needs.

The Dental Assistant program is accredited by the American Dental Association, Commission on Dental Accreditation and approved by the Minnesota State Board of Dentistry. Students are encouraged to have taken English, science, biology and computer classes prior to or during the Dental Assistant program. CPR certification is required prior to entering the program.

The A.A.S. degree plan is designed for students who are interested in continuing their educational career in dental hygiene after completion of the Dental Assistant program.

Career Opportunities

Dental Assistants are in high demand in private practices, group practices and clinics, government public health clinics, dental sales, insurance companies, educational institutions as well as the armed forces. Graduates are eligible to become certified and registered upon successful completion of the required state and national examinations. A state registration certificate and national certification are awarded to graduates who pass these examinations.

Technical Studies Required		**42 Credits**
DNTL1000	Introduction to Dental Assisting	2
DNTL1120	Dental Science	3
DNTL1140	Dental Materials	3
DNTL1160	Preclinical Chairside Assisting	3
DNTL1180	Chairside Assisting I	4
DNTL1200	Dental Health	2
DNTL1220	Chairside Assisting II	4
DNTL1241	Dental Radiology	4
DNTL1261	Expanded Functions	7
DNTL1321	Clinical Externship I	4
DNTL1325	Clinical Externship II	4
COMM1040	Job Seeking Skills	2
General Education Required		**12 Credits**
COMM2050	Interpersonal Communication	3
or		
COMM2060	Small Group Communication	3
CPLT1100	Introduction to Personal Computers	3
PHIL2100	Critical Thinking	3
PHIL2200	Ethics	3
General Education Elective		**6 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Total Associate in Applied Science Degree **60 Credits**

Diploma
Dental Assistant (BP/EP)

Overview

The Dental Assistant is an important member of a professional health team. As a Dental Assistant, the student will perform many duties at chairside, assisting the dentist during patient treatment and completion of records. The assistant must also be skilled in related office tasks and procedures including appointment scheduling and telephone communications as well as laboratory procedures. A registered dental assistant is able to perform all expanded duties authorized by the MN State Board of Dentistry. Several of these duties are taking radiographs (x-rays), polishing teeth, placing pit and fissure sealants, taking impressions, performing orthodontic procedures, placement and removal of rubber dams and removal of sutures and surgical dressings.

Personal qualities considered essential for this occupation are the ability to work well with others, the desire to be a part of a professional team, manual dexterity, good communication skills, ability to follow direct supervision and to be sensitive to others' needs.

The Dental Assistant program is accredited by the American Dental Association, Commission on Dental Accreditation and approved by the Minnesota State Board of Dentistry. Students are encouraged to have taken English, science, biology and computer classes prior to or during the Dental Assistant program. CPR certification is required prior to entering the program.

Career Opportunities

Dental Assistants are in high demand in private practices, group practices and clinics, government public health clinics, dental sales, insurance companies, educational institutions as well as the armed forces. Graduates are eligible to become certified and registered upon successful completion of the required state and national examinations. A state registration certificate and national certification are awarded to graduates who pass these examinations.

Technical Studies Required		**40 Credits**
DNTL1000	Introduction to Dental Assisting	2
DNTL1120	Dental Science	3
DNTL1140	Dental Materials	3
DNTL1160	Preclinical Chairside Assisting	3
DNTL1180	Chairside Assisting I	4
DNTL1200	Dental Health	2
DNTL1220	Chairside Assisting II	4
DNTL1241	Dental Radiology	4
DNTL1261	Expanded Functions	7
DNTL1321	Clinical Externship I	4
DNTL1325	Clinical Externship II	4
General Education Required		**7 Credits**
CPLT1100	Introduction to Personal Computers	3
COMM1016	Teambuilding in the Workplace	2
or		
COMM1050	Communication in the Workplace	2
COMM1040	Job Seeking Skills	2
Total Diploma		**47 Credits**

Emergency Medical Services

Occupational Certificate
Emergency Medical Services Specialist (Hopkins Tech Center)

Overview

The EMS Certificate provides enhanced entry-level job training for employment in a Basic Life Support (BLS) ambulance service and the Advanced Life Support (ALS) EMS ride-along experience requirements for persons interested in entering a paramedic program. Several certificate courses provide transferable credit to Inver Hills Community College Emergency Health Services (paramedic) program. Included in the program is an 80 hour internship with Metro ALS Ambulance Services. Areas covered are special transportation training, an ambulance service operations and run simulation course, behind-the-wheel emergency driving course, proper lifting techniques plus interpersonal communication skills that paramedic schools and employers are seeking.

Career Opportunities

The EMS Certificate prepare and enhances a person's job opportunities for work as an EMT in a BLS medical transportation service or in a ALS service that combines EMT's and paramedics. The certificate meets several prerequisites in course work and the ride-along ALS ambulance experience required for entry into paramedic programs.

Technical Studies Required		**15 Credits**
EMSV1100	Emergency Medical Technician - Basic	6
EMSV1105	Ambulance Operations	2
EMSV1110	Lifting Techniques for Health Professionals	1
EMSV1115	Passenger Assistant Technician	1
EMSV1120	Ambulance Internship	2
EMSV1130	Emergency Vehicle Driving Skills	1
EMSV1145	Medical Terminology for EMS/ER Personnel	2
General Education Required		**2 Credits**
COMM1050	Communication in the Workplace	2
or		
COMM2050	Interpersonal Communication	3
Technical Studies Elective		**6 Credits**
COMM1040	Job Seeking Skills	2
CPLT1100	Introduction to Personal Computers	3
EMGT1100	Orientation to Emergency Management	3
EMSV1135	Understanding EKG's	1
EMSV1140	CPR Instructor	1
EMSV1155	Phlebotomy Techniques	3
EMSV1170	ER Procedures and Internship	3
ENGL2120	Writing and Research	3
Total Occupational Certificate		**23 Credits**

Occupational Certificate
Emergency Room Technician (Hopkins Tech Center)

Overview

The Emergency Room Technician (ER Tech) Certification prepares you to be part of the health care team in an Emergency Department (ED) or Urgent Care setting. This certificate will enhances your job opportunities because of the knowledge and skills acquired in the classroom plus the supervised internship in a metro hospital Emergency Department. Some of the courses and skills taught are EMT, administering a 12 lead EKG test, venipuncture techniques (blood drawing), splinting and casting, urinary catheterization, wound cleaning, IV setup and proper lifting techniques. Successful passing of Nursing Assistant written and skills tests are required.

Career Opportunities

The new ER Tech Certification provides a standard that Hospitals ED's and Urgent Care Centers and clinics are seeking in this entry-level position for a health care career. This training and work experience will expose you and prepare you for other health care careers in hospitals and clinics.

Technical Studies Required		**16 Credits**
EMSV1100	Emergency Medical Technician - Basic	6
EMSV1110	Lifting Techniques for Health Professionals	1
EMSV1135	Understanding EKG's	1
EMSV1145	Medical Terminology for EMS/ER Personnel	2
EMSV1155	Phlebotomy Techniques	3
EMSV1170	ER Procedures and Internship	3
General Education Required		**2 Credits**
COMM1050	Communication in the Workplace	2
or		
COMM2050	Interpersonal Communication	3
	Total Occupational Certificate	**18 Credits**

Health Unit Coordinator

Diploma
Health Unit Coordinator (BP/EP)

Overview

The Health Unit Coordinator Diploma is a continuation of the Health Unit Coordinator Certificate. Students who choose to continue their certificate education and enroll in the diploma option, will complete 17 additional credits (8 credits in General Education and 9 credits in Technical Studies). The Health Unit Coordinator Diploma is designed to provide a broader clinical and/or clerical base than the certificate and therefore increase the students options for employment.

The Health Unit Coordinator is an important member of a professional health team. As a Health Unit Coordinator the student will perform many duties in a hospital or office setting including assisting the nursing staff with the non-clinical clerical tasks. The job responsibilities include transcribing physician's orders, answering the telephone and intercom, performing patient admission, transfer and discharge procedures, operating the nursing unit equipment (including the computer), ordering daily diets and laboratory studies, scheduling diagnostic studies, filing patient data in the chart and ordering supplies and repair items. Additional tasks include managing the supplies and equipment, performing the receptionist role, protecting the confidentiality of patient information, setting priorities and organizing the workload in a nursing unit.

Personal qualities considered essential for this occupation are the ability to be detail oriented and multi-tasked working with a high degree of accuracy while working in a busy environment. The successful Health Unit Coordinator is able to solve problems logically and give good customer service. They must be self-motivated and conscientious to complete work independently. All health care workers must have a high degree of ethics in maintaining the confidentiality of patient information. They also must be professional in both appearance and interaction with others.

Career Opportunities

Health Unit Coordinators are in high demand in hospitals (some of the larger hospitals employ as many as 100 Health Unit Coordinators at one time), nursing homes, clinics, doctors' offices and insurance companies. There is a great opportunity for a variety of work schedules. Health Unit Coordinators work part-time and full-time. A variety of shifts are available. Graduates are eligible to become nationally certified upon successful completion of the optional national examination.

Technical Studies Required		16 Credits
HLUC1001	Health Unit Coordinator Fundamentals	3
HLUC1020	Medical Terminology	2
HLUC1040	Basic Pharmacology	1
HLUC1060	Diagnostic and Therapeutic Procedures	2
HLUC1100	Processing Physician's Orders	3
HLUC1120	Expanded HUC Role	2
HLUC1200	Health Unit Coordinator Internship	3
General Education Required		**4 Credits**
COMM1050	Communication in the Workplace	2
or		
COMM1016	Teambuilding in the Workplace	2
CPLT1000	Computer Keyboarding	2
General Education Elective		**6 Credits**

Any HTC college level general education course may be used to satisfy the elective requirement.

Technical Studies Elective		7 Credits
CCIS1101	Windows XP	3
CCIS1035	Word for Windows I	3
HLUC1140	HUC Certification Test Review	1
HLUC1900	Specialized Lab	1-4
NURS1001	Nursing Assistant	4
NURS1111	Anatomy and Physiology	5
Total Diploma		**33 Credits**

Occupational Certificate
Health Unit Coordinator (BP/EP)

Overview

The Health Unit Coordinator Certificate concentrates on coursework directly related to working at the nursing unit in health care facilities. It is designed to enable the student to learn the fundamentals for reading doctors orders and accurately relay those orders to the appropriate department. Upon completion of this certificate, students may choose to find employment or continue their education in the Health Unit Coordinator Diploma.

The Health Unit Coordinator is an important member of a professional health team. As a Health Unit Coordinator the student will perform many duties in a hospital or office setting including assisting the nursing staff with the non-clinical clerical tasks. The job responsibilities include transcribing physician's orders, answering the telephone and intercom, performing patient admission, transfer and discharge procedures, operating the nursing unit equipment (including the computer), ordering daily diets and laboratory studies, scheduling diagnostic studies, filing patient data in the chart and ordering supplies and repair items. Additional tasks include managing the supplies and equipment, performing the receptionist role, protecting the confidentiality of patient information, setting priorities and organizing the workload in a nursing unit.

Personal qualities considered essential for this occupation are the ability to be detail oriented and multi-tasked working with a high degree of accuracy while working in a busy environment. The successful Health Unit Coordinator is able to solve problems logically and give good customer service. They must be self-motivated and conscientious to complete work independently. All health care workers must have a high degree of ethics in maintaining the confidentiality of patient information. They also must be professional in both appearance and interaction with others.

Career Opportunities

Health Unit Coordinators are in high demand in hospitals (some of the larger hospitals employ as many as 100 Health Unit Coordinators at one time), nursing homes, clinics, doctors' offices and insurance companies. There is a great opportunity for a variety of work schedules. Health Unit Coordinators work part-time and full-time. A variety of shifts are available. Graduates are eligible to become nationally certified upon successful completion of the optional national examination.

Technical Studies Required		14 Credits
HLUC1001	Health Unit Coordinator Fundamentals	3
HLUC1020	Medical Terminology	2
HLUC1040	Basic Pharmacology	1
HLUC1060	Diagnostic and Therapeutic Procedures	2
HLUC1100	Processing Physician's Orders	3
HLUC1200	Health Unit Coordinator Internship	3
General Education Required		**2 Credits**
CPLT1000	Computer Keyboarding	2
Total Occupational Certificate		**16 Credits**

Practical Nursing

Diploma
Practical Nursing (BP/EP)

Overview

The courses listed are designated to meet the requirements of the Minnesota Board of Nursing for qualifying to take the practical nursing state board licensing examination (NCLEX-PN). Upon successful completion of NCLEX-PN the graduate practical nurse is licensed and registered as a Licensed Practical Nurse. Licensed Practical Nurses provide direct care under the supervision of a licensed physician or registered nurse. Licensed Practical Nurses use the nursing process to collect patient data and implement nursing care in maintenance of health as well as caring for those who are ill, injured or who have debilitating conditions. Students attending courses full-time can complete this program in 3 semesters. Part-time students can complete this program in 5 semesters. Criminal background studies are required. See "Background Studies" in the front of this catalog for details.

Prerequisite: NURS1001, MATH1000, and current CPR card-Level C.

Career Opportunities
Opportunities for employment may be available in hospitals, clinics, home health agencies, long-term care facilities, transitional care facilities, industry and the armed forces.

Technical Studies Required		**44 Credits**
NURS1111	Anatomy and Physiology	5
NURS1120	Medical Terms	1
NURS1130	Introduction to Practical Nursing	1
NURS1141	Pharmacology for Practical Nurses	4
NURS1151	Phases of Adulthood	2
NURS1161	Nursing Skills I	3
NURS1191	Adult Nursing I	4
NURS1221	Adult Nursing II	3
NURS1241	Maternal Child Nursing	3
NURS1261	Nursing Skills II	3
NURS2110	Psychosocial Nursing	2
NURS2120	Preparation for Practice	1
NURS1101	Clinical I (Acute Care)	4
and		
NURS1203	Clinical II (LTC)	4
or		
NURS1103	Clinical I (LTC)	4
and		
NURS1201	Clinical II (Acute Care)	4
NURS2300	Clinic Nursing	2
NURS2400	Integrated Practicum	2
General Education Required		**5 Credits**
ENGL2120	Writing and Research	3
MATH1000	Prealgebra	2
Total Diploma		**49 Credits**

Associate in Applied Science Degree Practical Nursing (BP/EP)

Overview
The courses listed are designated to meet the requirements of the Minnesota Board of Nursing for qualifying to take the practical nursing state board licensing examination (NCLEX-PN). Upon successful completion of NCLEX-PN the graduate practical nurse is licensed and registered as a Licensed Practical Nurse. Licensed Practical Nurses provide direct care under the supervision of a licensed physician or registered nurse. Licensed Practical Nurses use the nursing process to collect patient data and implement nursing care in maintenance of health as well as caring for those who are ill, injured or who have debilitating conditions. Students attending courses full-time can complete this program in 3 semesters. Criminal background studies are required. See "Background Studies" in the front of this catalog for details.

Prerequisite: ENGL2120, MATH1000, NURS1001, NURS1111, NURS1120, NURS1130 and CPR for Health Professionals.

Career Opportunities
Opportunities for employment may be available in hospitals, clinics, home health agencies, long-term care facilities, transitional care facilities, industry and the armed forces.

Technical Studies Required		**46 Credits**
MATH1000	Prealgebra	2
NURS1111	Anatomy and Physiology	5
NURS1120	Medical Terms	1
NURS1130	Introduction to Practical Nursing	1
NURS1141	Pharmacology for Practical Nurses	4
NURS1151	Phases of Adulthood	2
NURS1161	Nursing Skills I	3
NURS1191	Adult Nursing I	4
NURS1221	Adult Nursing II	3
NURS1241	Maternal Child Nursing	3
NURS1261	Nursing Skills II	3
NURS2110	Psychosocial Nursing	2
NURS2120	Preparation for Practice	1
NURS1101	Clinical I (Acute Care)	4
and		
NURS1203	Clinical II (LTC)	4
or		
NURS1103	Clinical I (LTC)	4
and		
NURS1201	Clinical II (Acute Care)	4
NURS2300	Clinic Nursing	2
NURS2400	Integrated Practicum	2
General Education Required		**15 Credits**
COMM2050	Interpersonal Communication	3
ENGL2120	Writing and Research	3
PHIL2200	Ethics	3
SSCI2100	Introduction to Sociology	3
SSCI2300	General Psychology	3
General Education Elective		**3 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Total Associate in Applied Science Degree	**64 Credits**

Manufacturing & Electronic CAREERS

Manufacturing & Electronic
CAREERS

Automated Machinery Systems: Packaging

Associate in Applied Science Degree
Automated Machinery Systems (EP)

Overview

Work in the packaging field will vary according to the product manufactured, the process and machinery used, and the utilization of the product. However, most companies categorize the work into the following positions: Automated Machine Mechanic - a highly skilled individual whose skills include the ability to diagnose and quickly solve a problem so production flow is maintained. This person is competent in electronics, hydraulics, pneumatics, robotics, welding, machinist skills, the use of personal computers and programmable controllers. These skills, plus a knowledge of packaging fundamentals, make the automated packaging mechanic invaluable in today's automated technology. Automated Machine Technician - a professional person who, in addition to performing the duties of the packaging machine mechanic, is knowledgeable in packaging materials, machinery and systems used in the field of automation. Technicians are called upon to assist engineers in the development and modification of new and existing designs. Technicians set up production lines and train in-plant machine operators and maintenance personnel on its operation and troubleshooting techniques.

Career Opportunities

Automated packaging machine mechanics and technicians are in high demand; surveys indicate even a greater demand as technology further advances. Before reaching the consumer, almost every product is packaged and packed in several forms. Automation in the manufacturing industry is a high opportunity field. This is a Packaging Machinery Manufacturers Institute (PMMI) approved program.

Technical Studies Required		**46 Credits**
APKG1125	Power Transmission and Mechanical Systems	4
APKG1130	Maintenance Operations	2
APKG1155	Automation Controls	3
APKG1160	Machinery Systems I	4
APKG1165	Machinery Systems II - Quality Control	3
APKG1170	Machinery Systems III	3
APKG1190	Introduction to Programmable Logic Controllers	3
APKG2100	Advanced Industrial Controls	4
APKG2105	Automated Motion Control	2
APKG2110	Programmable Logic Controllers	4
APKG2150	Packaging Machine Design and Component Fabrication	2
FLPW1231	Industrial Electricity I	3
FLPW1236	Industrial Electricity II	3
MACH1056	Blueprint Reading I	3
METS1030	Quality Assurance/Statistical Process Control	3
General Education Required		**12 Credits**
ENGL2120	Writing and Research	3
or		
ENGL2125	Technical Writing	3
MATH2100	Concepts in Mathematics	3
or		
MATH2200	College Algebra	4
METS1000	Computers in Manufacturing	3
PHIL2100	Critical Thinking	3
General Education Elective		**6 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective **8 Credits**

Any APKG, ELEC, FLPW, MACH, or MCDT course that is not required for this award may be used as an elective.

Total Associate in Applied Science Degree **72 Credits**

Diploma
Automated Machinery Systems: Packaging (EP)

Overview

Work in the packaging field will vary according to the product manufactured, the process and machinery used, and the utilization of the product. However, most companies categorize the work into the following positions: Automated Machine Mechanic - a highly skilled individual whose skills include the ability to diagnose and quickly solve a problem so production flow is maintained. This person is competent in electronics, hydraulics, pneumatics, robotics, welding, machinist skills, the use of personal computers and programmable controllers. These skills, plus a knowledge of packaging fundamentals, make the automated packaging mechanic invaluable in today's automated technology. Automated Machine Technician - a professional person who, in addition to performing the duties of the packaging machine mechanic, is knowledgeable in packaging materials, machinery and systems used in the field of automation. Technicians are called upon to assist engineers in the development and modification of new and existing designs. Technicians set up production lines and train in-plant machine operators and maintenance personnel on its operation and troubleshooting techniques.

Career Opportunities

Automated packaging machine mechanics and technicians are in high demand; surveys indicate even a greater demand as technology further advances. Before reaching the consumer, almost every product is packaged and packed in several forms. Automation in the manufacturing industry is a high opportunity field. This is a Packaging Machinery Manufacturers Institute (PMMI) approved program.

Technical Studies Required		**46 Credits**
APKG1125	Power Transmission and Mechanical Systems	4
APKG1130	Maintenance Operations	2
APKG1155	Automation Controls	3
APKG1160	Machinery Systems I	4
APKG1165	Machinery Systems II - Quality Control	3
APKG1170	Machinery Systems III	3
APKG1190	Introduction to Programmable Logic Controllers	3
APKG2100	Advanced Industrial Controls	4
APKG2105	Automated Motion Control	2
APKG2110	Programmable Logic Controllers	4
APKG2150	Packaging Machine Design and Component Fabrication	2
FLPW1231	Industrial Electricity I	3
FLPW1236	Industrial Electricity II	3
MACH1056	Blueprint Reading I	3
METS1030	Quality Assurance/Statistical Process Control	3
General Education Required		**8 Credits**
COMM1050	Communication in the Workplace	2
MATH1000	Prealgebra	2
METS1000	Computers in Manufacturing	3
SSCI1000	Introduction to Environmental Health and Safety	1
Technical Studies Elective		**10 Credits**

Any APKG, ELEC, FLPW, MACH, or MCDT course that is not required for this award may be used as an elective.

Total Diploma **64 Credits**

Diploma
Automated Machinery Adjuster (EP)

Overview

The automated machinery operator/setup person is skilled in the hands-on operation and changeover of automated production and packaging machines used in manufacturing. The person is competent in basic mechanical skills and standard operation procedures.

Career Opportunities

Career opportunities are entry-level positions in manufacturing companies.

Technical Studies Required		**28 Credits**
APKG1125	Power Transmission and Mechanical Systems	4
APKG1130	Maintenance Operations	2
APKG1155	Automation Controls	3
APKG1160	Machinery Systems I	4
APKG1165	Machinery Systems II - Quality Control	3
APKG1170	Machinery Systems III	3
FLPW1231	Industrial Electricity I	3
FLPW1236	Industrial Electricity II	3
MACH1056	Blueprint Reading I	3
General Education Required		**5 Credits**
COMM1050	Communication in the Workplace	2
MATH1000	Prealgebra	2
SSCI1000	Introduction to Environmental Health and Safety	1

Total Diploma **33 Credits**

Electronics Technology

Associate in Applied Science Degree
Electronics Technician (BP)

Overview

The Electronic Technician is an important member of the technical team. Their job as part of the team is to work with engineers and other professionals in the design, manufacture, testing, repair and maintenance of technical systems. There is a wide variety of job situations the technician will encounter. These may include repairing equipment or testing systems while working in the plant or in the field. The Electronic Technician may be required to have extensive software skills in addition to their electronic skills. Some positions may require travel, lifting and working with people from other companies to complete the task.

The skills the technician needs to bring to the team are the ability to analyze circuits or systems and work with tools and test equipment. Other important qualities are the desire to be part of a professional team, good communication skills and the ability to work under supervision or independently.

Graduates who choose the A.A.S. Degree usually have a future goal of a four year degree in Engineering, Computer Science or other degree that will lead to a higher level of employment.

Career Opportunities

Electronic Technicians are in demand in small to large companies and virtually all government agencies including the Department of Transportation, Federal Aviation Administration and the US Post Office. Technicians may work for the manufacturers, sellers, end users or third party maintenance organizations. Technicians may hold any one of the following job titles: Technical Sales, Troubleshooter, Installer, Support Specialist, Field Service, Depot Repair Technician, Test Technician, Quality Control Technician, Network Technician, Telecommunication Technician or Engineer Assistant.

Technical Studies Required		**48 Credits**
ELEC1000	DC Circuits	4
ELEC1050	AC Circuits	4
ELEC1100	Complex AC Circuits	3
ELEC1150	Diodes and Rectifiers	2
ELEC1200	Soldering Skills	1
ELEC1250	Solid State Components and Circuits	5
ELEC1300	Operational Amplifiers	2
ELEC1350	Regulated Power Supplies	2
ELEC1400	Basic Troubleshooting	3
ELEC1450	Basic Digital Logic	3
ELEC2000	Computer Circuits and Applications I	4
ELEC2020	Computer Circuits and Applications II	3
ELEC2050	Advanced Troubleshooting	4
ELEC2200	Microprocessors and Microcomputers I	4
ELEC2220	Microprocessors and Microcomputers II	4

General Education Required		**12 Credits**
ENGL2120	Writing and Research	3
or		
ENGL2125	Technical Writing	3
MATH2100	Concepts in Mathematics	3
or		
MATH2200	College Algebra	4
METS1000	Computers in Manufacturing	3
PHIL2100	Critical Thinking	3

General Education Elective **6 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective		**6 Credits**
ELEC1900	Specialized Lab	1-4
ELEC2100	Motor and Motor Controllers	3
ELEC2300	Troubleshooting Computers	3
ELEC2400	Industrial Controls	2
ELEC2420	Telemetry	2
ELEC2500	A+ Certification Preparation	4

Total Associate in Applied Science Degree **72 Credits**

Diploma
Electronics Technician (BP)

Overview

The Electronic Technician is an important member of the technical team. Their job as part of the team is to work with engineers and other professionals in the design, manufacture, testing, repair and maintenance of technical systems. There is a wide variety of job situations the technician will encounter. These may include repairing equipment or testing systems while working in the plant or in the field. The Electronic Technician may be required to have extensive software skills in addition to their electronic skills. Some positions may require travel, lifting and working with people from other companies to complete the task.

The skills the technician needs to bring to the team are the ability to analyze circuits or systems and work with tools and test equipment. Other important qualities are the desire to be part of a professional team, good communication skills and the ability to work under supervision or independently.

Career Opportunities

Electronic Technicians are in demand in small to large companies and virtually all government agencies including the Department of Transportation, Federal Aviation Administration and the US Post Office.

Technicians may work for the manufacturers, sellers, end users or third party maintenance organizations. Technicians may hold any one of the following job titles: Technical Sales, Troubleshooter, Installer, Support Specialist, Field Service, Depot Repair Technician, Test Technician, Quality Control Technician, Network Technician, Telecommunication Technician or Engineer Assistant.

Technical Studies Required		**48 Credits**
ELEC1000	DC Circuits	4
ELEC1050	AC Circuits	4
ELEC1100	Complex AC Circuits	3
ELEC1150	Diodes and Rectifiers	2
ELEC1200	Soldering Skills	1
ELEC1250	Solid State Components and Circuits	5
ELEC1300	Operational Amplifiers	2
ELEC1350	Regulated Power Supplies	2
ELEC1400	Basic Troubleshooting	3
ELEC1450	Basic Digital Logic	3
ELEC2000	Computer Circuits and Applications I	4
ELEC2020	Computer Circuits and Applications II	3
ELEC2050	Advanced Troubleshooting	4
ELEC2200	Microprocessors and Microcomputers I	4
ELEC2220	Microprocessors and Microcomputers II	4
General Education Required		**10 Credits**
COMM1050	Communication in the Workplace	2
METS1000	Computers in Manufacturing	3
MATH1010	Beginning Algebra	2
MATH1031	Intermediate Algebra	3
Technical Studies Elective		**6 Credits**
ELEC1900	Specialized Lab	1-4
ELEC2100	Motor and Motor Controllers	3
ELEC2300	Troubleshooting Computers	3
ELEC2400	Industrial Controls	2
ELEC2420	Telemetry	2
ELEC2500	A+ Certification Preparation	4
Total Diploma		**64 Credits**

Occupational Certificate Low Voltage Copper and Fiber Technician (EP)

Overview

The Copper/Fiber Technician certificate prepares individuals for entry-level positions in the video, voice & data communications field. Employment opportunities exist for qualified technicians to install, troubleshoot, repair, and maintain copper and fiber optic systems in a wide range of industrial, commercial, residential and institutional settings.

The program presents practical skills that enable the learner to work safely, and efficiently, with copper and fiber optic physical media. There is an emphasis on standards, signal transmission theory, different media types, cable installation, troubleshooting techniques, terminations, and testing. Instruction is performed by a certified instructor using lecture, lab, and CD-Rom.

Career Opportunities

Leading Telecommunications product manufacturers (Berk-Tek, Leviton, Hubbell Premise Wiring, Radiall and Specified Technologies Inc.) have reviewed the C-Tech curriculum for content and applicability are promoting the hiring of C-Tech graduates to their networks of dealers.

Companies that use electricity/electronics, hydraulics, pneumatics, robotics, lasers, plastics, welding, machining, computers and programmable logic controllers, are looking for certified technicians to install, maintain, repair, and troubleshoot copper and fiberoptic communication systems.

Technical Studies Required		**16 Credits**
ELEC1000	DC Circuits	4
ELEC1500	Introduction to Telecommunications	2
ELEC1525	Introduction to Copper Based Systems	2
ELEC1550	Introduction to Fiber Optic Based Systems	2
FLPW1231	Industrial Electricity I	3
METS1000	Computers in Manufacturing	3
Total Occupational Certificate		**16 Credits**

Occupational Certificate Broadband Installation Technician (EP) *(Pending MnSCU Approval)*

Overview

Broadband Installation Technicians are responsible for the installation and support of a variety of services including Digital Cable, High Speed Data and Digital Phone. In addition to possessing solid customer service skills, the technician should be knowledgeable in the installation and routing of cables, pc configuration and multiple operating systems. Equally important, is the ability to recognize, troubleshoot and resolve problems on the system and with customer's equipment ensuring that all systems are fully operational and the customer understands and is satisfied with the products that they have ordered.

Career Opportunities:

Students completing this 30 credit certificate are employable as broadband installation technicians servicing digital cable, high speed data and digital phones. In Minnesota, employment in this industry is expected to grow faster than average.

Note:

This certificate will be offered Fall 2004 pending MnSCU approval. Course information will be available on the Hennepin Technical College website as it becomes available.

Engineering CAD Technology

Associate in Applied Science Degree
Engineering CAD Technology (BP/EP)

Overview

The Engineering CAD Technology degree is designed for students seeking a career in the design and development of manufactured products. Engineering CAD Technicians are specialists in translating the rough sketches, layouts and written specifications of the engineer or more senior designer into a drawing showing complete details and specifications. For nearly every type of fabricated products, from a light fixture to a motorcycle, or a computer monitor to a bridge, a design technician is needed to detail the entire project and its component parts. Strength calculations, product reliability, computer aided design (CAD) and specifications, and cost of materials may also be the responsibilities of the person trained in the occupation.

Career Opportunities

Persons trained in Engineering CAD work for companies which manufacture machinery, electrical equipment, computers, fabricated metal products, and transportation equipment. Others are employed by the government in public works, highway departments, or ordinance plants. Advanced competencies qualify a person for employment in industry as a Engineering CAD Technician. Experienced technicians with CAD skills are in demand.

Technical Studies Required		**44 Credits**
ENGC1011	Engineering Drawing I	3
ENGC1021	Engineering Drawing II	3
ENGC1041	Geometric Dimensioning & Tolerancing	3
ENGC1100	AutoCAD I	4
ENGC1160	Inventor	4
ENGC1201	Industrial CAD Project	3
ENGC1250	SolidWorks I	4
ENGC2011	Special Fields of Drafting	3
ENGC2100	Pro/ENGINEER I	4
ENGC2110	Pro/ENGINEER II	4
MACH1056	Blueprint Reading I	3
METS1020	Industrial Manufacturing Processes	3
METS2000	Engineering Design Principles	3
General Education Required		**12 Credits**
ENGL2120	Writing and Research	3
or		
ENGL2125	Technical Writing	3
MATH2100	Concepts in Mathematics	3
or		
MATH2200	College Algebra	4
METS1000	Computers in Manufacturing	3
PHIL2100	Critical Thinking	3
General Education Elective		**6 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective		**10 Credits**
APKG1200	Introduction to Robotics	2
ENGC1255	SolidWorks II	4
ENGC1900	Specialized Lab	1-4
ENGC2050	AutoCAD Upgrade Training	1
ENGC2075	Engineering Design Project	3
ENGC2200	Engineering CAD Technology Internship	3-4
FLPW1101	Fluid Power Technology I	3
MACH1205	Machine Tool Technology	3
METS2100	Statics and Strength of Materials	3
Total Associate in Applied Science Degree		**72 Credits**

Diploma
Engineering CAD Technology (BP/EP)

Overview

The Engineering CAD Technology diploma is designed for students seeking a career in the design and development of manufactured products. Engineering CAD Technicians are specialists in translating the rough sketches, layouts and written specifications of the engineer or more senior designer into a drawing showing complete details and specifications. For nearly every type of fabricated products, from a light fixture to a motorcycle, or a computer monitor to a bridge, a design technician is needed to detail the entire project and its component parts. Strength calculations, product reliability, computer aided design (CAD) and specifications, and cost of materials may also be the responsibilities of the person trained in the occupation.

Career Opportunities

Persons trained in Engineering CAD work for companies which manufacture machinery, electrical equipment, computers, fabricated metal products, and transportation equipment. Others are employed by the government in public works, highway departments, or ordinance plants. Advanced competencies qualify a person for employment in industry as a Engineering CAD Technician. Experienced technicians with CAD skills are in demand.

Technical Studies Required		**46 Credits**
ENGC1011	Engineering Drawing I	3
ENGC1021	Engineering Drawing II	3
ENGC1041	Geometric Dimensioning & Tolerancing	3
ENGC1100	AutoCAD I	4
ENGC1160	Inventor	4
ENGC1201	Industrial CAD Project	3
ENGC1250	SolidWorks I	4
ENGC2011	Special Fields of Drafting	3

ENGC2100	Pro/ENGINEER I	4
ENGC2110	Pro/ENGINEER II	4
MACH1056	Blueprint Reading I	3
MACH2425	Geometry/Trigonometry for Machinists	2
METS1020	Industrial Manufacturing Processes	3
METS2000	Engineering Design Principles	3

General Education Required **7 Credits**

COMM1050	Communication in the Workplace	2
MATH1010	Beginning Algebra	2
METS1000	Computers in Manufacturing	3

General Education Elective **1 Credit**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective **10 Credits**

APKG1200	Introduction to Robotics	2
FLPW1101	Fluid Power Technology I	3
ENGC1255	SolidWorks II	4
ENGC1900	Specialized Lab	1-4
ENGC2050	AutoCAD Upgrade Training	1
ENGC2075	Engineering Design Project	3
ENGC2200	Engineering CAD Technology Internship	3-4
METS2100	Statics and Strength of Materials	3

Total Diploma **64 Credits**

Advanced Technical Certificate AutoCAD Operator (BP/EP)

Overview

The AutoCAD Operator certificate is designed to provide up-to-date AutoCAD skills for the person already trained or experienced in a technical field. Elective courses can be selected to best suit each students special needs and interests.

Prerequisite: Graduation from or concurrent enrollment in a 2 year Engineering CAD or machining program or a minimum of 2 years of related work experience.

Career Opportunities

Employment opportunities are as limited or as diverse as the student's individual background. Companies of all types are looking for people with a technical background and AutoCAD skills.

Technical Studies Required **8 Credits**

ENGC1100	AutoCAD I	4
ENGC1160	Inventor	4

Technical Studies Elective **9 Credits**

ENGC1011	Engineering Drawing I	3
ENGC1021	Engineering Drawing II	3
ENGC1201	Industrial CAD Project	3
ENGC1250	SolidWorks I	4
ENGC1255	SolidWorks II	4
ENGC1900	Specialized Lab	1-4
ENGC2100	Pro/ENGINEER I	4
MACH1056	Blueprint Reading I	3
MACH2410	CAD/CAM	3
METS1000	Computers in Manufacturing	3
METS1020	Industrial Manufacturing Processes	3

Total Advanced Technical Certificate **17 Credits**

Advanced Technical Certificate Pro/ENGINEER Operator (BP/EP)

Overview

The Pro/ENGINEER Operator Certificate is designed for people with a solid background in mechanical design and/or machining. The coursework is project based and emphasis will be placed on creating solid models, assemblies, and detail drawings.

Prerequisite: Graduation from or concurrent enrollment in a 2 year Engineering CAD or machining program or a minimum of 2 years of related work experience.

Career Opportunities

Most Pro/ENGINEER Operators work in the design or engineering departments of manufacturing facilities creating or changing parametric solid models, assemblies, and detail drawings according to an engineer's specifications; however, career opportunities are not limited to engineering office jobs. Jobs in this field pay well. Employers prefer students with machining and/or mechanical design experience.

Technical Studies Required **8 Credits**

ENGC2100	Pro/ENGINEER I	4
ENGC2110	Pro/ENGINEER II	4

Technical Studies Elective **9 Credits**

ENGC1011	Engineering Drawing I	3
ENGC1021	Engineering Drawing II	3
ENGC1100	AutoCAD I	4
ENGC1160	Inventor	4
ENGC1201	Industrial CAD Project	3
ENGC1250	SolidWorks I	4
ENGC1255	SolidWorks II	4
ENGC1900	Specialized Lab	1-4
MACH1056	Blueprint Reading I	3
MACH2410	CAD/CAM	3
METS1000	Computers in Manufacturing	3

Total Advanced Technical Certificate **17 Credits**

Fluid Power Technician

Associate in Applied Science Degree
Fluid Power (BP/EP)

Overview
The Fluid Power A.A.S. degree program prepares individuals to perform high level research and design work. Emphasis is placed on system design, test and evaluation, problem solving, business communications, system integration, computer aided circuit construction and programmable logic controls. Technicians design, modify and specify motion controls for today's high speed production equipment. The program will focus on improving system efficiency through the integration of technologies such as hydraulics, pneumatics, PLC's, industrial controls and computers. Individuals with a high mechanical aptitude that enjoy working with their hands as well as their minds should consider this program. This individual must be a people orientated person.

Career Opportunities
The fluid power industry is one of the fastest growing technologies today. Technicians will find employment with industries in automation, material handling and processing, heavy equipment, plant automation and fluid power distribution. These opportunities will exist in large and small companies in local as well as international markets. Jobs will include supervision, engineering, inside and outside sales consultant and product development.

Technical Studies Required		**54 Credits**
FLPW1101	Fluid Power Technology I	3
FLPW1106	Fluid Power Technology II	4
FLPW1150	Pneumatic Components	4
or		
FLPW1181	Pumps, Actuators, and Conductors	4
FLPW1191	Hydraulic Components	3
FLPW1231	Industrial Electricity I	3
FLPW1320	Hydraulic Circuits	2
FLPW1340	Pneumatic Circuits and Air Logic	4
FLPW2000	Programmable Logic Controllers	3
FLPW2112	Instrumentation of Fluid Power Systems (Industrial or Automated Machines)	3
FLPW2180	Circuit Design	3
FLPW2191	Industrial Circuit Design	3
FLPW2250	Proportional and Servo Controls (Robotics Application)	3
FLPW2301	Mobile Circuit Design	3
FLPW2321	System Engineering Portfolio	3
MACH1056	Blueprint Reading I	3
METS2000	Engineering Design Principles	3
Choose one of the following:		
ENGC1100	AutoCAD I	4
ENGC1160	Inventor	4
ENGC1250	SolidWorks I	4
ENGC2100	Pro/ENGINEER I	4

General Education Required		**12 Credits**
ENGL2120	Writing and Research	3
or		
ENGL2125	Technical Writing	3
MATH2100	Concepts in Mathematics	3
or		
MATH2200	College Algebra	4
METS1000	Computers in Manufacturing	3
PHIL2100	Critical Thinking	3

General Education Elective **6 Credits**
Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Total Associate in Applied Science Degree **72 Credits**

Diploma
Fluid Power Technician (BP/EP)

Overview
Fluid Power Technicians are responsible for building and modifying fluid power systems. Technicians calculate system parameters, design hydraulic and pneumatic circuits, evaluate operating systems and recommend changes for maximum efficiency. This program will focus on hydraulic and pneumatic component repair and testing, industrial electricity, programmable logic controls, circuit design and system design. Emphasis will be placed on computer aided circuit construction and software programming of automated systems. Individuals that enjoy working with their hands as well as their minds and have a high mechanical aptitude should consider this program. Technicians must be able to read schematics, determine adjustments to improve system efficiency and recommend circuit changes. Technicians test components and systems, document changes and build new systems.

Career Opportunities
Fluid Power Technicians will find employment with fluid power manufacturing companies, sales organizations and distributors. Positions vary from fluid power technician, inside sales consultant, industrial maintenance technician and product testing.

Technical Studies Required		**54 Credits**
FLPW1101	Fluid Power Technology I	3
FLPW1106	Fluid Power Technology II	4
FLPW1150	Pneumatic Components	4
or		
FLPW1181	Pumps, Actuators, and Conductors	4
FLPW1191	Hydraulic Components	3

FLPW1231	Industrial Electricity I	3
FLPW1320	Hydraulic Circuits	2
FLPW1340	Pneumatic Circuits and Air Logic	4
FLPW2000	Programmable Logic Controllers	3
FLPW2112	Instrumentation of Fluid Power Systems (Industrial or Automated Machines)	3
FLPW2180	Circuit Design	3
FLPW2191	Industrial Circuit Design	3
FLPW2250	Proportional and Servo Controls (Robotics Application)	3
FLPW2301	Mobile Circuit Design	3
FLPW2321	System Engineering Portfolio	3
MACH1056	Blueprint Reading I	3
METS2000	Engineering Design Principles	3

Choose one of the following:

ENGC1100	AutoCAD I	4
ENGC1160	Inventor	4
ENGC1250	SolidWorks I	4
ENGC2100	Pro/ENGINEER I	4

General Education Required		**7 Credits**
METS1000	Computers in Manufacturing	3
COMM1050	Communication in the Workplace	2
MATH1010	Beginning Algebra	2

General Education Elective **1 Credit**

Any HTC college level general education course may be used to satisfy the elective requirement.

Technical Studies Elective		**4 Credits**
FLPW1236	Industrial Electricity II	3
FLPW2020	Advanced Programmable Logic Controllers	3
FLPW2350	Hydraulic Specialist Certification Review	2
FLPW2360	Pneumatic Specialist Certification Review	2
METS2100	Statics and Strength of Materials	3
Total Diploma		**66 Credits**

Diploma
Fluid Power Mechanic (BP/EP)

Overview

The Fluid Power Mechanic fabricates, assembles, repairs and tests hydraulic and pneumatic components. The mechanic must follow instructions, read schematics, read precision measuring devices, record data and analyze test data. This person troubleshoots automated equipment, performs routine maintenance and connects units to automated control systems. Individuals with previous mechanical experience, small engine or automotive backgrounds do extremely well in the Fluid Power Mechanic program.

This program is designed to prepare an individual to meet the challenges of current industry trends. The program courses cover hydraulics, pneumatics, blueprint reading, programmable logic controls and industrial electricity.

Career Opportunities

The Fluid Power Mechanic will find employment in hydraulic repair facilities, heavy equipment repair/service and manufacturing in industries such as food processing, plastics, printing, precision metal and woodworking industries.

Technical Studies Required		**29 Credits**
FLPW1101	Fluid Power Technology I	3
FLPW1106	Fluid Power Technology II	4
FLPW1150	Pneumatic Components	4
or		
FLPW1181	Pumps, Actuators, and Conductors	4
FLPW1191	Hydraulic Components	3
FLPW1231	Industrial Electricity I	3
FLPW1320	Hydraulic Circuits	2
FLPW1340	Pneumatic Circuits and Air Logic	4
FLPW2000	Programmable Logic Controllers	3
METS2000	Engineering Design Principles	3
General Education Required		**5 Credits**
MATH1000	Prealgebra	2
METS1000	Computers in Manufacturing	3
Total Diploma		**34 Credits**

Occupational Certificate
Industrial Maintenance Mechanic (BP/EP)

Overview

The Industrial Maintenance Mechanic performs routine maintenance on production equipment such as die-casting, plastic manufacturing, food processing, machining and automated woodworking equipment. The job responsibilities include adjusting machines, scheduling preventative maintenance, changing filters, trouble-shooting and repairing production machines.

The Industrial Maintenance Mechanic must be able to complete detailed tasks in today's high speed production environment. The mechanic will read electrical, fluid power and mechanical schematics to ensure machines are operating efficiently.

Career Opportunities

Industrial Maintenance Mechanics are employed in the die-casting, plastics, food processing, printing, precision metal and woodworking industries. Coursework involves a broad curricula of industrial electricity, hydraulic and pneumatics and blueprint reading. Emphasis will be hands-on training repairing and testing of hydraulic and pneumatic equipment.

Technical Studies Required		**18 Credits**
FLPW1101	Fluid Power Technology I	3
FLPW1106	Fluid Power Technology II	4
FLPW1150	Pneumatic Components	4
or		
FLPW1181	Pumps, Actuators, and Conductors	4
FLPW1231	Industrial Electricity I	3
FLPW1340	Pneumatic Circuits and Air Logic	4
Total Occupational Certificate		**18 Credits**

Industrial Building Engineering and Maintenance

Industrial Building Engineering and Maintenance (BP)

Overview

The Industrial Building Engineering and Maintenance diploma provides students with a multi-discipline education in building and machine maintenance technologies. This program will educate the student in various aspects of boiler operation, maintenance carpentry, heating and cooling applications, hydraulic and pneumatic components, industrial electrical and motor control systems, machine-tool processes, welding, fluid conductor application, CAD operation, machine repair and troubleshooting practices.

Career Opportunities

The maintenance field is one that offers consistence and long term employment opportunities. The maintenance of buildings and machines is a vital and ever-present task at all industrial facilities. Career opportunities exist in small and large companies and employment can be found in local as well as in the national markets. The maintenance technician will find jobs that include any or all of these duties: repair and maintenance of the inside and outside of the facility, carpentry, boiler operation, the preservation of heating and air conditioning systems, up keep of material handling equipment and preventative maintenance and repair of manufacturing machines and related equipment.

Technical Studies Required		**39 Credits**
ENGC1100	AutoCAD I	4
FLPW1101	Fluid Power Technology I	3
FLPW1150	Pneumatic Components	4
FLPW1231	Industrial Electricity I	3
FLPW1236	Industrial Electricity II	3
FLPW2000	Programmable Logic Controllers	3
HVAC1180	MN Special Boilers License	1
IBEM1000	Welding Maintenance	3
IBEM1010	Carpentry Maintenance	3
IBEM1020	HVAC Maintenance	3
IBEM1030	Tube and Pipe Repair	2
IBEM1040	Rigging Procedures and Forklift Operations	1
MACH1056	Blueprint Reading I	3
MACH1205	Machine Tool Technology	3
General Education Required		**5 Credits**
MATH1000	Prealgebra	2
METS1000	Computers in Manufacturing	3
Total Diploma		**44 Credits**

Machine Tool Technology

Associate in Applied Science Degree Computer Numerical Control (CNC) Technician (BP)

Overview

CNC Technicians are machinists with additional skills in programming, setup and operating computer driven machine tools. Most high-tech products including computers, aircraft and medical devices use precision components made on CNC machine tools. The CNC Technician relies on a strong background of machining skills. These skills include the understanding of machines, tooling, blueprints, and additional methods used to produce and inspect a part. After determining the best manufacturing strategies and selecting tools, a CNC program is developed. CAD/CAM (Computer Aided Design/Computer Aided Manufacturing) software is many times used to assist in developing the CNC program.

Career Opportunities

The successful CNC Technician may start his/her career as a CNC operator and progress to CNC setup, programmer, or inspector. Well paying jobs are available in the medical, aerospace, computer and recreational industries.

Technical Studies Required		**50 Credits**
MACH1056	Blueprint Reading I	3
MACH1100	Introduction to Machining Technology	3
MACH1105	Drilling and Sawing Processes	2
MACH1110	Turning Technology I	3
MACH1120	Turning Technology II	3
MACH1125	Milling Technology I	3
MACH1130	Milling Technology II	3
MACH1135	Precision Grinding	2
MACH1140	Introduction to CNC	3
MACH2400	CNC Setup and Operation	3
MACH2406	CNC Programming	3
MACH2410	CAD/CAM	3
MACH2415	CNC Milling	3
MACH2420	Blueprint Reading II for Machinists	2
MACH2430	CNC Machining Centers	3
MACH2435	CNC Turning Centers	3
MACH2440	Quality Assurance	2
MACH2500	Introduction to Swiss-Style Machining	3
General Education Required		**12 Credits**
ENGL2120	Writing and Research	3
or		
ENGL2125	Technical Writing	3
MATH2100	Concepts in Mathematics	3
or		
MATH2200	College Algebra	4
METS1000	Computers in Manufacturing	3
PHIL2100	Critical Thinking	3

General Education Elective **6 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective **4 Credits**

MACH1145	Machinists Reference Materials	1
MACH1900	Specialized Lab	1-4
MACH2425	Geometry/Trigonometry for Machinists	2
MACH2445	Heat Treating and Metallurgy	2
MACH2450	Fundamentals of EDM	2
MACH2475	Gibbs CAD/CAM Milling	3
MACH2475	Gibbs CAD/CAM Milling	3

Total Associate in Applied Science Degree **72 Credits**

Associate in Applied Science Degree Tool and Die/Moldmaking (BP)

Overview

Diemakers are machinists with additional skills in designing and constructing metal-stamping dies. They build the dies that mass-produce parts for many industries including small appliances, computers, automobiles, and aircraft. Diemakers use both manual and computer-controlled machine tools to build intricate and close tolerance dies. Diemakers need those skills to work to close tolerances, interpret blueprints, and follow detailed instructions.

Moldmakers are machinists with additional skills in the design and construction of plastic injection molds. They build the molds that mass-produce the plastic products that make our high-tech world possible. The molding process produces products ranging from pens to automobile parts to medical implants. Moldmakers use both manual and computer-controlled machine tools to build plastic injection molds that require intricate 3-dimensional shapes and close tolerances. Moldmakers must be able to visualize 3-dimensional objects from a blueprint, pay attention to details, and work to close tolerances.

Career Opportunities

Career opportunities are available for these highly-skilled professionals. Tool and Die/Moldmakers work in both small and large companies. The Tool and Die/Moldmakers skills qualify him/her for good pay and jobs that encourage creativity and innovation. Opportunities exist to move into management positions or start a business.

Technical Studies Required **50 Credits**

MACH1056	Blueprint Reading I	3
MACH1100	Introduction to Machining Technology	3
MACH1105	Drilling and Sawing Processes	2
MACH1110	Turning Technology I	3
MACH1120	Turning Technology II	3
MACH1125	Milling Technology I	3
MACH1130	Milling Technology II	3
MACH1135	Precision Grinding	2
MACH1140	Introduction to CNC	3
MACH2400	CNC Setup and Operation	3
MACH2406	CNC Programming	3
MACH2410	CAD/CAM	3
MACH2420	Blueprint Reading II for Machinists	2
MACH2450	Fundamentals of EDM	2
MACH2455	Die/Mold Design	3
MACH2460	Die Construction	3
MACH2465	Mold Construction	3
MACH2500	Introduction to Swiss-Style Machining	3

General Education Required **12 Credits**

ENGL2120	Writing and Research	3
or		
ENGL2125	Technical Writing	3
MATH2100	Concepts in Mathematics	3
or		
MATH2200	College Algebra	4
METS1000	Computers in Manufacturing	3
PHIL2100	Critical Thinking	3

General Education Elective **6 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective **4 Credits**

MACH1145	Machinists Reference Materials	1
MACH1900	Specialized Lab	1-4
MACH2415	CNC Milling	3
MACH2425	Geometry/Trigonometry for Machinists	2
MACH2430	CNC Machining Centers	3
MACH2435	CNC Turning Centers	3
MACH2445	Heat Treating and Metallurgy	2
MACH2450	Fundamentals of EDM	2
MACH2475	Gibbs CAD/CAM Milling	3

Total Associate in Applied Science Degree **72 Credits**

Diploma
Computer Numerical Control (CNC) Technician (BP)

Overview

CNC Technicians are machinists with additional skills in programming, setup and operating computer driven machine tools. Most high-tech products including computers, aircraft and medical devices use precision components made on CNC machine tools. The CNC Technician relies on a strong background of machining skills. This includes the understanding of machines, tooling, blueprints, and additional methods used to produce and inspect a part. After determining the best manufacturing strategies and selecting tools, a CNC program is developed. CAD/CAM (Computer Aided Design/Computer Aided Manufacturing) software is many times used to assist in developing the CNC program.

Career Opportunities

The successful CNC Technician may start his/her career as a CNC operator and progress to CNC setup, programmer, or inspector. Well paying jobs are available in the medical, aerospace, computer and recreational fields.

Technical Studies Required		**52 Credits**
MACH1056	Blueprint Reading I	3
MACH1100	Introduction to Machining Technology	3
MACH1105	Drilling and Sawing Processes	2
MACH1110	Turning Technology I	3
MACH1120	Turning Technology II	3
MACH1125	Milling Technology I	3
MACH1130	Milling Technology II	3
MACH1135	Precision Grinding	2
MACH1140	Introduction to CNC	3
MACH2400	CNC Setup and Operation	3
MACH2406	CNC Programming	3
MACH2410	CAD/CAM	3
MACH2415	CNC Milling	3
MACH2420	Blueprint Reading II for Machinists	2
MACH2425	Geometry/Trigonometry for Machinists	2
MACH2430	CNC Machining Centers	3
MACH2435	CNC Turning Centers	3
MACH2440	Quality Assurance	2
MACH2500	Introduction to Swiss-Style Machining	3
General Education Required		**7 Credits**
MATH1000	Prealgebra	2
MATH1010	Beginning Algebra	2
METS1000	Computers in Manufacturing	3
General Education Elective		**1 Credit**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective		**4 Credits**
MACH1145	Machinists Reference Materials	1
MACH1900	Specialized Lab	1-4
MACH2445	Heat Treating and Metallurgy	2
MACH2450	Fundamentals of EDM	2
MACH2470	Advanced CNC Turning Centers	3
MACH2475	Gibbs CAD/CAM Milling	3
Total Diploma		**64 Credits**

Diploma
Tool and Die/Moldmaking (BP)

Overview

Diemakers are machinists with additional skills in designing and constructing metal-stamping dies. They build the dies that mass-produce parts for many industries including small appliances, computers, automobiles, and aircraft. Diemakers use both manual and computer-controlled machine tools to build intricate and close tolerance dies. Diemakers need those skills to work to close tolerances, interpret blueprints, and follow detailed instructions.

Moldmakers are machinists with additional skills in the design and construction of plastic injection molds. They build the molds that mass-produce the plastic products that make our high-tech world possible. The molding process produces products ranging from pens to automobile parts to medical implants. Moldmakers use both manual and computer-controlled machine tools to build plastic injection molds that require intricate 3-dimensional shapes and close tolerances. Moldmakers must be able to visualize 3-dimensional objects from a blueprint, pay attention to details, and work to close tolerances.

Career Opportunities

Career opportunities are available for these highly-skilled professionals. Tool and Die/Moldmakers work in both small and large companies. The Tool and Die/Moldmakers skills qualify him/her for good pay and jobs that encourage creativity and innovation. Opportunities exist to move into management positions or start a business.

Technical Studies Required		**52 Credits**
MACH1056	Blueprint Reading I	3
MACH1100	Introduction to Machining Technology	3
MACH1105	Drilling and Sawing Processes	2
MACH1110	Turning Technology I	3
MACH1120	Turning Technology II	3
MACH1125	Milling Technology I	3
MACH1130	Milling Technology II	3
MACH1135	Precision Grinding	2
MACH1140	Introduction to CNC	3
MACH2400	CNC Setup and Operation	3

MACH2406	CNC Programming	3
MACH2410	CAD/CAM	3
MACH2420	Blueprint Reading II for Machinists	2
MACH2425	Geometry/Trigonometry for Machinists	2
MACH2450	Fundamentals of EDM	2
MACH2455	Die/Mold Design	3
MACH2460	Die Construction	3
MACH2465	Mold Construction	3
MACH2500	Introduction to Swiss-Style Machining	3

General Education Required **7 Credits**

MATH1000	Prealgebra	2
MATH1010	Beginning Algebra	2
METS1000	Computers in Manufacturing	3

General Education Elective **1 Credit**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective **4 Credits**

MACH1145	Machinists Reference Materials	1
MACH1900	Specialized Lab	1-4
MACH2415	CNC Milling	3
MACH2430	CNC Machining Centers	3
MACH2435	CNC Turning Centers	3
MACH2445	Heat Treating and Metallurgy	2

Total Diploma **64 Credits**

Advanced Technical Certificate Computer Numerical Control (CNC) Setup Technician (BP)

Overview

CNC Setup Technicians run computer-controlled machine tools that produce highly precise parts used in many of the products we use on a daily basis. Setup Technicians may tend one machine or several at one time. Setup Technician duties vary from operating the machine to setup of cutting tools, fixtures, programs, and producing the complete part. The CNC Setup Technician Advanced Technical certificate builds upon the skills developed for the CNC Operator certificate with additional training in computer numerical control. Emphasis will be placed on basic programming, editing, and operation of CNC lathes and milling machines.

Career Opportunities

Many well-paying jobs are available in medical, aerospace, computer and recreational industries. Completion of this certificate may lead to entry-level employment as a CNC Setup Technician.

Technical Studies Required **17 Credits**

MACH2400	CNC Setup and Operation	3
MACH2406	CNC Programming	3
MACH2410	CAD/CAM	3
MACH2415	CNC Milling	3
MACH2425	Geometry/Trigonometry for Machinists	2
MACH2435	CNC Turning Centers	3

Total Advanced Technical Certificate **17 Credits**

Advanced Technical Certificate CNC Swiss Turning Center Technician (BP)

Overview

Swiss-type lathes are a specialized type of lathe used for machining high precision parts in large quantities. They are capable of producing very small parts with many operations in one chucking. The productivity of the Swiss-type lathe is very high as the machine can perform many operations in one setting that would typically require two or more machines to produce. Swiss-type lathes have been an asset to the growing medical device industry. Production of the tiny implantable, high precision parts made from exotic materials like titanium are a good fit for these machines. Skills needed for setup and operation of Swiss-type lathes include basic machining skills and a knowledge of CNC Swiss-type machining centers.

Prerequisite: Graduation from or concurrent enrollment in a 2 year machine tool program or a minimum or 2 years of related work experience

Career Opportunities

As the products we use everyday decrease in size, the parts that make up those products also get smaller. The growing medical device industry is a good example of the need for tiny sophisticated parts. Producing these parts requires special skills, knowledge and machine tools. Increased global competition in manufacturing also requires increased productivity to remain competitive in the market place. Swiss-type turning centers provide capability and the productivity to produce small high-precision parts efficiently. Demand for machinists with these specialized skills is growing and should continue to increase.

Technical Studies Required **9 Credits**

MACH2500	Introduction to Swiss-Style Machining	3
MACH2505	CNC Swiss-Style Lathe Setup and Operation	3
MACH2510	CNC Swiss-Style Lathe Programming	3

Total Advanced Technical Certificate **9 Credits**

Occupational Certificate
CNC Operator (BP)

Overview

CNC operators make precision and intricate parts for many industries including medical, computer, aerospace and recreational industries. They use computer-operated machine tools following explicit specifications to produce components. These components are produced from many types of metals and other materials. CNC operators are skilled workers who can efficiently operate basic CNC machine tools. The successful CNC operator must also be able to read shop drawings and use precision measuring instruments and hand tools. They must have acquired enough knowledge and sound judgment to perform many machining operations. In addition, they should be capable of making mathematical calculations required for machining the required parts. Credits earned for this certificate may be combined with other certificates and courses to earn a diploma.

Career Opportunities

CNC operators are employed in both small and large manufacturing firms that produce durable goods. Excellent opportunities exist for personal and professional growth in this industry.

Technical Studies Required		**25 Credits**
MACH1056	Blueprint Reading I	3
MACH1100	Introduction to Machining Technology	3
MACH1105	Drilling and Sawing Processes	2
MACH1110	Turning Technology I	3
MACH1120	Turning Technology II	3
MACH1125	Milling Technology I	3
MACH1130	Milling Technology II	3
MACH1135	Precision Grinding	2
MACH1140	Introduction to CNC	3
General Education Required		**5 Credits**
MATH1000	Prealgebra	2
METS1000	Computers in Manufacturing	3
Total Occupational Certificate		**30 Credits**

Manufacturing Engineering Technology

Associate in Applied Science Degree
Manufacturing Engineering Technology (BP/EP)

Overview

A manufacturing engineering technician is a professional person who is flexible, self-motivated, team-oriented, and capable of assigning as well as following instructions. Manufacturing engineering technicians are called upon to assist engineers in the research, development and the modification of new and current designs, products and processes. Many technicians are involved in the assembly, acceptance testing, and providing field service support for current products. The technician possesses an understanding of CAD drafting, engineering drawings, fluid power fundamentals, instrumentation and data acquisition, industrial electrical and electronics applications, machining and tooling principles and precision measurement.

The Manufacturing Engineering Technology A.A.S. degree program provides the student with a multi-discipline skill base and prepares the individual to perform the high level tasks that are required in today's global manufacturing market. This degree is unique in that it allows the student to receive a broad-based education in the manufacturing environment along with a specialization in one or more of the many areas involved in this field. The student may choose to specialize in automated machinery systems, electronics, fluid power, machine technology, engineering CAD or plastic technology. This degree is also intended for those seeking career advancement. Students may continue their education and proceed towards a Bachelors in Manufacturing degree which prepares the student for supervisory and management positions.

Career Opportunities

This is one of the fastest growing areas of employment in manufacturing occupations. There is an extensive shortage of individuals who possess a multi-discipline skill base. Global market competition has directed manufacturing companies to seek out the multi-facet candidate. As a result of these situations, demand for the graduate is extremely high. The employment positions offer excellent opportunities for personal and professional growth. Individuals who seek a career as a manufacturing engineering technician may find jobs in a variety of diverse areas such as: assembly, automation, manufacturing, quality assurance, research and development, design, and field service. Job duties may include supervision, engineering, and product development along with customer relations and travel. Manufacturing Engineering Technicians are in high demand in small to large companies and within various government agencies. The Manufacturing Engineering Technician is well positioned for advancement opportunities as well as long term employment.

Technical Studies Required **54 Credits**

ELEC1000	DC Circuits	4
or		
FLPW1231	Industrial Electricity I	3
FLPW1101	Fluid Power Technology I	3
FLPW2000	Programmable Logic Controllers	3
or		
APKG1190	Introduction to Programmable Logic Controllers	3
MACH1056	Blueprint Reading I	3
MACH1205	Machine Tool Technology	3
METS1020	Industrial Manufacturing Processes	3
METS1030	Quality Assurance/Statistical Process Control	3
METS2000	Engineering Design Principles	3
METS2100	Statics and Strength of Materials	3
PLST1041	Introduction to Plastics Molding Processes	3
or		
APKG1125	Power Transmission and Mechanical Systems	4

Choose one of the following:

ENGC1100	AutoCAD I	4
ENGC1160	Inventor	4
ENGC1250	SolidWorks I	4
ENGC2100	Pro/ENGINEER I	4

Automated Machinery Systems: Packaging Specialization

APKG1130	Maintenance Operations	2
APKG1155	Automation Controls	3
APKG1160	Machinery Systems I	4
APKG1165	Machinery Systems II - Quality Control	3
APKG1170	Machinery Systems III	3
APKG2105	Automated Motion Control	2
APKG2110	Programmable Logic Controllers	4
APKG2150	Packaging Machine Design and Component Fabrication	2

Electronics Specialization

ELEC1050	AC Circuits	4
ELEC1100	Complex AC Circuits	3
ELEC1150	Diodes and Rectifiers	2
ELEC1200	Soldering Skills	1
ELEC1250	Solid State Components and Circuits	5
ELEC1300	Operational Amplifiers	2
ELEC1400	Basic Troubleshooting	3
ELEC1450	Basic Digital Logic	3

Engineering CAD Specialization

ENGC1011	Engineering Drawing I	3
ENGC1021	Engineering Drawing II	3
ENGC1041	Geometric Dimensioning & Tolerancing	3
ENGC1201	Industrial CAD Project	3

Select at least 8 credits from the following:

ENGC1100	AutoCAD I	4
ENGC1160	Inventor	4
ENGC1250	SolidWorks I	4
ENGC2011	Special Fields of Drafting	3
ENGC2100	Pro/ENGINEER I	4
ENGC2110	Pro/ENGINEER II	4

Fluid Power Specialization

FLPW1106	Fluid Power Technology II	4
FLPW1150	Pneumatic Components	4
or		
FLPW1181	Pumps, Actuators, and Conductors	4
FLPW1191	Hydraulic Components	3
FLPW1236	Industrial Electricity II	3
FLPW1320	Hydraulic Circuits	2
FLPW1340	Pneumatic Circuits and Air Logic	4

Machining Specialization

MACH1110	Turning Technology I	3
MACH1125	Milling Technology I	3
MACH2400	CNC Setup and Operation	3
MACH2406	CNC Programming	3
MACH2410	CAD/CAM	3
MACH2415	CNC Milling	3
MACH2435	CNC Turning Centers	3

Plastics Manufacturing Specialization

PLST1008	Fundamentals of Plastics/Chemistry and Ingredients	4
PLST1037	Machining/Finishing and Fabrication Processes	4
PLST2007	Properties and Tests of Selected Plastics	4

Select at least 9 credits from the following:

PLST2011	Extrusion Molding Processes I	3
PLST2016	Extrusion Molding Processes II	3
PLST2127	Injection Molding Process I	3
PLST2137	Injection Molding Process II	3
PLST2142	Injection Molding Process III	3
PLST2300	Plastics Manufacturing Technology Internship	4

General Education Required **12 Credits**

ENGL2120	Writing and Research	3
or		
ENGL2125	Technical Writing	3
MATH2100	Concepts in Mathematics	3
or		
MATH2200	College Algebra	4
METS1000	Computers in Manufacturing	3
PHIL2100	Critical Thinking	3

General Education Elective **6 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Total Associate in Applied Science Degree **72 Credits**

Advanced Technical Certificate
Lean Manufacturing 450.6004 (EP)

Overview

This certificate offers the knowledge and skills necessary to work in industries using lean and other quality practices. Lean Manufacturing has come to encompass a wide variety of terms, concepts, and practices aimed at improving productivity and efficiency in manufacturing operations. This certificate will cover continuous improvement, process documentation, process improvement, value stream mapping to familiarize students with best practices in quality practices.

Prerequisite: Graduation from or concurrent enrollment in a two-year manufacturing program or a minimum of two years experience in manufacturing.

Career Opportunities

Students completing the Lean Manufacturing Certificate will be able to utilize this value-added credential for job enhancement and advancement.

Technical Studies Required		**12 Credits**
METS1500	Fundamentals of Quality Concepts and Systems	3
METS1505	Principles and Practices of Lean Manufacturing (Lean Tools and Techniques)	3
METS1510	Lean Project Management: Project Development and Implementation	3
Choose from one of the following:		
METS1515	Lean Beyond the Production Floor	3
METS1520	Advanced Tools in Lean Implementation	3
METS1525	Quality System/Lean Program Development	3
Total Advanced Technical Certificate		**12 Credits**

Plastics Manufacturing Technology

Diploma
Plastics Manufacturing Technology (BP)

Overview

Plastics Technicians are needed for the demands of the rapidly growing plastics forming industry. These demands include the operation of processing equipment and the transforming of polymers (plastics) into usable products.

Plastics personnel perform such operations as compounding materials, molding, forming, troubleshooting, inspecting, testing raw materials and finishing products, assisting in mold design and modification and developing new polymers (plastics) applications. Plastics Technicians acquire an understanding of polymers (plastics) processing equipment and materials.

Career Opportunities

There is a wide range of employment as well as advancement opportunities for the individual who seeks a career in the plastics forming industry. Plastics Technicians may find jobs in a variety of diverse areas such as; research and development, manufacturing, design and service. Employment potential lies in the following: supervision, molding technician, material handling, quality control, lab technician, engineering aids and in related areas such as the sale of plastics processing equipment and materials.

Technical Studies Required		**28 Credits**
METS1030	Quality Assurance/Statistical Process Control	3
PLST1008	Fundamentals of Plastics/Chemistry and Ingredients	4
PLST1037	Machining/Finishing and Fabrication Processes	4
PLST1041	Introduction to Plastics Molding Processes	3
PLST2007	Properties and Tests of Selected Plastics	4
PLST2300	Plastics Manufacturing Technology Internship	4
Select from 9 credits of Injection Molding or 6 credits of Extrusion Molding		
PLST2127	Injection Molding Process I	3
PLST2137	Injection Molding Process II	3
PLST2142	Injection Molding Process III	3
or		
PLST2011	Extrusion Molding Processes I	3
PLST2016	Extrusion Molding Processes II	3
General Education Required		**5 Credits**
COMM1050	Communication in the Workplace	2
METS1000	Computers in Manufacturing	3

Technical Studies Elective **3 Credits**

Any APKG, ELEC, FLPW, MACH, MCDT, METS, PLST or WLDG course that is not required for this award may be used as an elective.

PLST1900	Specialized Lab	1-4
Total Diploma		**36 Credits**

Occupational Certificate Extrusion Molding (BP)

Overview

This certificate is designed for individuals requiring skills and knowledge in the Extrusion Molding Processes I, II, related Quality Assurance/Statistical Process Control, properties and tests of selected plastics and thermoplastics used in the plastics (forming) industry will be emphasized.

Career Opportunities

This certificate is ideal for a new career or upgrading present knowledge and skills.

Technical Studies Required		**13 Credits**
PLST2007	Properties and Tests of Selected Plastics	4
PLST2011	Extrusion Molding Processes I	3
PLST2016	Extrusion Molding Processes II	3
METS1030	Quality Assurance/Statistical Process Control	3
Total Occupational Certificate		**13 Credits**

Occupational Certificate Injection Molding (BP)

Overview

This certificate is designed for individuals requiring knowledge and skills in the Injection Molding Process I, II, and III related Quality Assurance, Statistical Process Control and Properties and tests of selected plastics and thermoplastics used in the plastics (forming) industry will be emphasized.

Career Opportunities

This certificate is ideal for a new career or upgrading present knowledge and skills.

Technical Studies Required		**16 Credits**
PLST2007	Properties and Tests of Selected Plastics	4
PLST2127	Injection Molding Process I	3
PLST2137	Injection Molding Process II	3
PLST2142	Injection Molding Process III	3
METS1030	Quality Assurance/Statistical Process Control	3
Total Occupational Certificate		**16 Credits**

Welding and Metal Fabrication

Diploma Welding (BP)

Overview

This diploma will provide students with the entry-level skills and knowledge to perform as a shielded metal arc welder (SWAW); gas tungsten arc welder (GTAW) and as a gas metal arc welder (GMAW) with a minimum of supervision in all positions on ferrous and non ferrous metals. You can obtain entry-level employment by just taking a few courses that will lead towards a certificate in MIG or TIG welding. Taking additional courses will provide you with the opportunity for job advancement as a welder. Welding courses are also valuable for persons who have careers or interests that require some welding knowledge.

Career Opportunities

There are many employment opportunities available in the following areas: construction, transportation, manufacturing industry, sheet metal industry, custom job shops, medical/pharmaceutical industry, pipe/tubing, food industry and the aerospace industry.

Technical Studies Required		**45 Credits**
WLDG1135	Gas Metal Arc Welding I	3
WLDG1140	Gas Metal Arc Welding II	3
WLDG1165	Gas Metal Arc Welding III	3
WLDG1175	GMAW Fabrication Methods	3
WLDG1181	Blueprint Reading for Welders	3
WLDG1220	Gas Tungsten Arc Welding I	3
WLDG1225	Gas Tungsten Arc Welding II	3
WLDG1235	Gas Tungsten Arc Welding III	3
WLDG1245	GTAW Fabrication Methods	3
WLDG1310	Shielded Metal Arc Welding I	3
WLDG1320	Shielded Metal Arc Welding II	3
WLDG1330	Shielded Metal Arc Welding III	3
WLDG1340	Structural Iron Fabrication Methods	3
WLDG1350	Flux Cored Arc Welding I	3
WLDG1360	Flux Cored Arc Welding II	3
General Education Required		**2 Credits**
MATH1000	Prealgebra	2

General Education Elective **4 Credits**

Any HTC college level general education course may be used to satisfy the elective requirement.

Technical Studies Elective **3 Credits**

Any WLDG course that is not required for this award may be used as an elective.

Recommended:

WLDG1000	Cutting Processes	3
WLDG1100	Oxy-acetylene Welding, Brazing and Cutting Processes	3
WLDG1900	Specialized Lab	1-4
WLDG2160	Select Metals Based on Weldability	3
Total Diploma		**54 Credits**

Occupational Certificate
Structural Iron Fabrication and Repair (BP)

Overview
This program will provide the student with entry-level skills and knowledge to perform fabrication and repair in the following areas: structural iron fabrication, heavy equipment repair, industrial maintenance and precision layout and design.

Career Opportunities
There are many employment opportunities available in the following industries: agricultural, construction, heavy equipment repair and manufacturing, tank and pressure vessel repair.

Technical Studies Required		**21 Credits**
WLDG1181	Blueprint Reading for Welders	3
WLDG1310	Shielded Metal Arc Welding I	3
WLDG1320	Shielded Metal Arc Welding II	3
WLDG1330	Shielded Metal Arc Welding III	3
WLDG1340	Structural Iron Fabrication Methods	3
WLDG1350	Flux Cored Arc Welding I	3
WLDG1360	Flux Cored Arc Welding II	3
General Education Required		**2 Credits**
MATH1000	Prealgebra	2
Total Occupational Certificate		**23 Credits**

Occupational Certificate
GMAW Production Welder (MIG) (BP)

Overview
This certificate will provide the student with entry-level skills and knowledge to perform as a gas metal arc welder (GMAW) with minimum supervision in all positions in the following areas: production manufacturing, pipe/tubing, food industry, aerospace, and ornamental/sculpture, on ferrous and non-ferrous metals. You can obtain entry-level employment by just taking a few courses that will lead towards a certificate in MIG or TIG welding. Taking additional courses will provide you with the opportunity for job advancement as a welder. Welding courses are also valuable for persons who have careers or interests that require some welding knowledge.

Career Opportunities
There are many employment opportunities available in the following areas: construction, machinery manufacturing, sheet metal industry, and custom job shop.

Technical Studies Required		**15 Credits**
WLDG1181	Blueprint Reading for Welders	3
WLDG1135	Gas Metal Arc Welding I	3
WLDG1140	Gas Metal Arc Welding II	3
WLDG1165	Gas Metal Arc Welding III	3
WLDG1175	GMAW Fabrication Methods	3
General Education Required		**2 Credits**
MATH1000	Prealgebra	2
Total Occupational Certificate		**17 Credits**

Occupational Certificate
GTAW Production Welder (TIG) (BP)

Overview
This certificate will provide the student with entry-level skills and knowledge to perform as a gas tungsten arc welder (GTAW) with minimal supervision in all positions on ferrous and non ferrous metals. You can obtain entry-level employment by just taking a few courses that will lead towards a certificate in MIG or TIG welding. Taking additional courses will provide you with the opportunity for job advancement as a welder. Welding courses are also valuable for persons who have careers or interests that require some welding knowledge.

Career Opportunities
There are many employment opportunities available in the following areas manufacturing areas: medical/pharmaceutical, pipe/tubing, food and aerospace.

Technical Studies Required		**15 Credits**
WLDG1181	Blueprint Reading for Welders	3
WLDG1220	Gas Tungsten Arc Welding I	3
WLDG1225	Gas Tungsten Arc Welding II	3
WLDG1235	Gas Tungsten Arc Welding III	3
WLDG1245	GTAW Fabrication Methods	3
General Education Required		**2 Credits**
MATH1000	Prealgebra	2
Total Occupational Certificate		**17 Credits**

Media Communication
CAREERS

Audio Recording

Associate in Applied Science Degree	Audio Recording Specialist (EP)	72 Credits	Page 84
Diploma	Audio Recording Specialist (EP)	64 Credits	Page 84

Graphic Design

Associate in Applied Science Degree	Graphic Design - Creative Emphasis (BP)	72 Credits	Page 85
Associate in Applied Science Degree	Graphic Design - Web Design Emphasis (BP/EP)	72 Credits	Page 86
Diploma	Graphic Design - Creative Emphasis (BP)	64 Credits	Page 87
Diploma	Graphic Design - Web Design Emphasis (BP/EP)	64 Credits	Page 88
Diploma	Graphic Design - Production Emphasis (BP/EP)	51 Credits	Page 88
Occupational Certificate	Digital Production (BP/EP)	17 Credits	Page 89
Occupational Certificate	Production Technician for Digital Publishing (BP/EP)	28 Credits	Page 89
Occupational Certificate	Basic Web Technologies (BP/EP)	17 Credits	Page 90

MultiMedia/Video Design and Production

Associate in Applied Science Degree	Multimedia Designer (BP)	72 Credits	Page 90
Associate in Applied Science Degree	Video Production Specialist (BP)	72 Credits	Page 91
Diploma	Video Production Specialist (BP)	64 Credits	Page 91
Diploma	Multimedia Designer (BP)	64 Credits	Page 92
Occupational Certificate	Audio/Visual Specialist (BP)	26 Credits	Page 92

Printing & Prepress Technology

Associate in Applied Science Degree	Printing and Prepress Technology (BP)	72 Credits	Page 93
Diploma	Printing and Prepress Technology (BP)	64 Credits	Page 93
Occupational Certificate	Press Technician (BP)	30 Credits	Page 94
Occupational Certificate	Offset Press/Duplicator Operator (BP)	15 Credits	Page 94

Professional Photography

Associate in Applied Science Degree	Professional Photography Technology (EP)	68 Credits	Page 95
Diploma	Commercial Photography (EP)	62 Credits	Page 95
Diploma	Portrait and Wedding Photography (EP)	59 Credits	Page 96

Media Communication
CAREERS

Audio Recording

Associate in Applied Science Degree
Audio Recording Specialist (EP)

Overview
Audio engineers record and mix music, narration and sound effects for music and commercial productions, video, television, film and audiovisual projects. They are also involved with mastering and duplication to several audio formats, including cassette, compact disk and emerging mediums. Today's recording engineer needs to be well-versed in digital audio, including disk-based recording, MIDI and SMPTE applications, sampling and traditional analog tape recording technology.

Career Opportunities
Typical entry-level positions are often competitive and may involve long hours. Candidates who strive to advance beyond entry-level status must show a great degree of creativity, motivation and persistence. Well developed interpersonal skills are a must for success.

Entrepreneurism is alive and well in the audio field. Many engineers have secured permanent positions as a result of competent freelance work. Others have built their freelance work into successful businesses. Jobs exist in music and voice recording, location audio for video, corporate media production and live sound reinforcement. Many musicians/engineers specialize in advertising work, composing and recording exclusively for commercials and industrial clients. Relocation may be necessary to pursue your career as an audio recording specialist!

Technical Studies Required		**52 Credits**
ARSP1100	Introduction to Recording	3
ARSP1110	Studio Operations	4
ARSP1130	Audio Transducers	3
ARSP1140	Critical Listening	1
ARSP1300	Multitrack Recording Theory I	3
ARSP1310	Multitrack Recording Lab I	3
ARSP1320	Audio Signal Processing	3
ARSP1331	Introduction to MIDI	3
ARSP1350	Music Theory	2
ARSP1500	Multitrack Recording Theory II	3
ARSP1510	Multitrack Recording Lab II	3
ARSP1541	Acoustics and Recording Studio Design	2
ARSP2100	Multitrack Recording Theory III (Digidesign 210P)	1
ARSP2110	Multitrack Recording Lab III	2
ARSP2120	Digital Audio Theory (Digidesign 101)	3
ARSP2150	Music Business	2
ARSP2325	Digital Audio Theory II (Digidesign 201/210M)	3
ARSP2340	Studio Maintenance and Calibration	2
ARSP2580	Audio Recording Internship I	2
ARSP2585	Audio Recording Internship II	2
MATH1000	Prealgebra	2
General Education Required		**18 Credits**
COMM2060	Small Group Communication	3
CPLT1200	Introduction to Macintosh	3
ENGL2120	Writing and Research	3
PHIL2100	Critical Thinking	3
PHIL2200	Ethics	3
SSCI2100	Introduction to Sociology	3
Technical Studies Elective		**2 Credits**

Any ARSP course that is not required for this award may be used as an elective.

Total Associate in Applied Science Degree	**72 Credits**

Diploma
Audio Recording Specialist (EP)

Overview
Audio engineers record and mix music, narration and sound effects for music and commercial productions, video, television, film and audiovisual projects. They are also involved with mastering and duplication to several audio formats, including cassette, compact disk and emerging mediums. Today's recording engineer needs to be well-versed in digital audio, including disk-based recording, MIDI and SMPTE applications, sampling and traditional analog tape recording technology.

Career Opportunities
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Technical Studies Required		52 Credits
ARSP1100	Introduction to Recording	3
ARSP1110	Studio Operations	4
ARSP1130	Audio Transducers	3
ARSP1140	Critical Listening	1
ARSP1300	Multitrack Recording Theory I	3
ARSP1310	Multitrack Recording Lab I	3
ARSP1320	Audio Signal Processing	3
ARSP1331	Introduction to MIDI	3
ARSP1340	Location Recording	2
ARSP1350	Music Theory	2
ARSP1500	Multitrack Recording Theory II	3
ARSP1510	Multitrack Recording Lab II	3
ARSP1531	Using MIDI Equipment	3
ARSP1541	Acoustics and Recording Studio Design	2
ARSP2100	Multitrack Recording Theory III (Digidesign 210P)	1
ARSP2110	Multitrack Recording Lab III	2
ARSP2120	Digital Audio Theory (Digidesign 101)	3
ARSP2150	Music Business	2
ARSP2340	Studio Maintenance and Calibration	2
ARSP2580	Audio Recording Internship I	2
ARSP2585	Audio Recording Internship II	2
General Education Required		**7 Credits**
CPLT1200	Introduction to Macintosh	3
COMM1040	Job Seeking Skills	2
MATH1000	Prealgebra	2

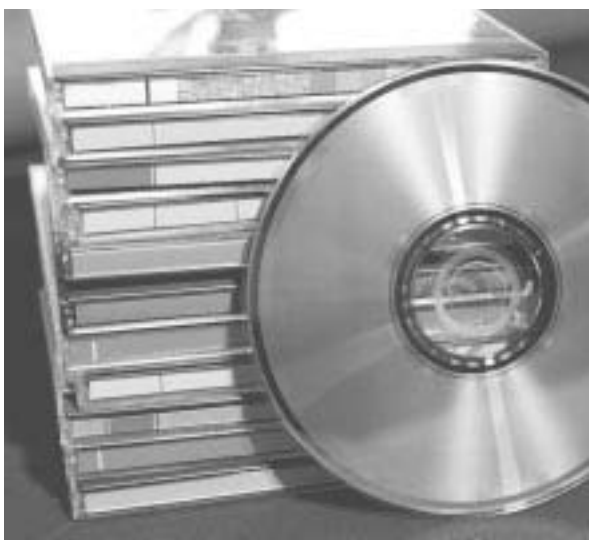
General Education Elective **1 Credit**

Any HTC college level general education course may be used to satisfy the elective requirement.

Technical Studies Elective **4 Credits**

Any ARSP course that is not required for this award may be used as an elective.

Total Diploma **64 Credits**



Graphic Design

Associate in Applied Science Degree Graphic Design - Creative Emphasis (BP)

Overview

Graphic design by definition is the applied art of designing any information, thought, idea or message for print and digital media. Graphic designers skillfully master advanced technology to transform an idea or concept. The transformation procedure is an integral part of the print or digital media production process. Graphic designers have an inherent ability to create by utilizing basic design principles and color theory; applying typographical knowledge and techniques; capturing digital graphic images; and manipulating photos and illustrations through various industry standard software and hardware components. The finished design may be delivered via the printed piece or web.

Are you a creative problem solver? Are you artistic? Do you work well under pressure? Do you like computers and technology? Do you adapt to change easily and quickly? Are you detail oriented? Do you communicate well with people? Are you a life-long learner? If so, the field of graphic design is an exciting and challenging career choice, a choice that gives the individual the power to be an effective participant in the world of media communications. This degree is also an excellent stepping-stone for those students who wish to pursue a four-year degree at some point in the future, but want the technical hands-on job training now!

Prerequisites: Testing score equivalent or CPLT1100 Introduction to to Personal Computers, CPLT1200 Introduction to Macintosh and MATH0900 Fundamentals of Mathematics.

Career Opportunities

Graphic design is an ever-changing and evolving professional career with many occupational categories and opportunities. One might find employment in a production environment, customer service, customer support, sales, creative production, consulting or training. Occupational titles include but are not limited to creative designer, graphic designer, print production artist, web designer, web producer, web developer, production artist, advertising artist, art typographer. Common working environments might include design or production, in a corporation, agency, advertising or marketing setting, printing company, or graphics service bureau.

Technical Studies Required		53 Credits
MGDP1220	Concepts in Creativity	3
MGDP1230	Photoshop	3
MMVP1515	Digital Media Technology	3
MPRT1210	Color Applications	3
MADV1010	Basic Drawing	3
MADV2000	Print Media Advertising	3
MADV2020	Collateral Advertising	3
MADV2030	Packaging and Display Advertising	3
MGDP1205	Fundamentals of Graphic Design	3
MGDP1225	QuarkXpress I	3
MGDP1235	Fundamentals of Digital Imaging	2
MGDP1240	Illustrator	3
MGDP1300	Digital Design Essentials	3
MGDP1325	QuarkXpress II	3
MGDP2000	Digital Publishing/Production	3
MGDP2010	Applied Graphic Design	3
MGDP2200	Design Portfolio	3
MPRT1200	Fundamentals of Printing	3
General Education Required		**12 Credits**
COMM2060	Small Group Communication	3
or		
COMM2130	Public Speaking	3
ENGL2120	Writing and Research	3
PHIL2100	Critical Thinking	3
SSCI2100	Introduction to Sociology	3

General Education Elective **6 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective **1 Credit**

Any MGDP, MMVP, or MPRT course that is not required for this award may be used as an elective.

Recommended:		
MGDP2215	Graphic Design Internship	1-12
Total Associate in Applied Science Degree		**72 Credits**

Associate in Applied Science Degree Graphic Design - Web Design Emphasis (BP/EP)

Overview

This degree is designed for individuals who wish to be involved in the design and implementation of web sites. Students will learn user interactivity and basic fundamentals of optimum Internet usage. These concepts are critical to the conception and design of a web site. The navigation, functionality, file size, image generation, and unity of design are stressed. Each student will design and develop a web portfolio or work as an intern in the industry as a requirement for graduation. There is an opportunity in this diploma to take electives in Computer Careers or Creative Graphic Design to enhance student skills.

Prerequisites: Testing score equivalent or CPLT1100 Introduction to to Personal Computers, CPLT1200 Introduction to Macintosh and MATH0900 Fundamentals of Mathematics.

Career Opportunities

Graphic design is an ever-changing and evolving professional career with many occupational categories and opportunities. One might find employment in a production environment, customer service, customer support, sales, creative production, consulting or training. Occupational titles include but are not limited to creative designer, graphic designer, print production artist, web designer, web producer, web developer, production artist, advertising artist, art typographer. Common working environments might include design or production, in a corporation, agency, advertising or marketing setting, printing company, or graphics service bureau.

Technical Studies Required		41 Credits
MGDP1220	Concepts in Creativity	3
MGDP1230	Photoshop	3
MMVP1515	Digital Media Technology	3
MPRT1210	Color Applications	3
CCIS1351	Advanced HTML using XHTML	4
MGDP1205	Fundamentals of Graphic Design	3
MGDP1240	Illustrator	3
MGDP1265	HTML using XHTML	3
MGDP1285	Fundamentals in Web Imaging	2
MGDP1320	Dreamweaver	3
MGDP1360	Acrobat	2
MGDP2100	Web Design/Production	3
MGDP2200	Design Portfolio	3
MMVP1520	Introduction to Flash	3
General Education Required		**12 Credits**
COMM2060	Small Group Communication	3
or		
COMM2130	Public Speaking	3
ENGL2120	Writing and Research	3
PHIL2100	Critical Thinking	3
SSCI2100	Introduction to Sociology	3

General Education Elective **6 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective **13 Credits**

Any MADV, MGDP, MMVP, or MPRT course that is not required for this award may be used as an elective.

Recommended:

MGDP2215	Graphic Design Internship	1-12

Total Associate in Applied Science Degree **72 Credits**

Diploma
Graphic Design - Creative Emphasis (BP)

Overview

Graphic design by definition is the applied art of designing any information, thought, idea or message for print and digital media. Graphic designers skillfully master advanced technology to transform an idea or concept. The transformation procedure is an integral part of the print or digital media production process.

Graphic designers have an inherent ability to create by utilizing basic design principles and color theory; applying typographical knowledge and techniques; capturing digital graphic images; and manipulating photos and illustrations through various industry standard software and hardware components.

Are you a creative problem solver? Are you artistic? Do you work well under pressure? Do you like computers and technology? Do you adapt to change easily and quickly? Are you detail oriented? Do you communicate well with people? Are you a life-long learner? If so, the field of graphic design is an exciting and challenging career choice, a choice that gives the individual the power to be an effective participant in the world of media communications. This diploma prepares you for the creative Graphic Design field that works so closely with printing, web and multi-media industries.

Prerequisites: Testing score equivalent or CPLT1100 Introduction to to Personal Computers, CPLT1200 Introduction to Macintosh and MATH0900 Fundamentals of Mathematics.

Career Opportunities

Graphic design is an ever-changing and evolving professional career with many occupational categories and opportunities. One might find employment in a production environment, customer service, customer support, sales, creative production, consulting or training. Occupational titles include but are not limited to creative designer, graphic designer, print production artist, web designer, web producer, web developer, production artist, advertising artist, art typographer. Common working environments might include design or production, in a corporation, agency, advertising or marketing setting, printing company, or graphics service bureau.

Technical Studies Required		**53 Credits**
MGDP1220	Concepts in Creativity	3
MGDP1230	Photoshop	3
MMVP1515	Digital Media Technology	3
MPRT1210	Color Applications	3
MADV1010	Basic Drawing	3
MADV2000	Print Media Advertising	3
MADV2020	Collateral Advertising	3
MADV2030	Packaging and Display Advertising	3
MGDP1205	Fundamentals of Graphic Design	3
MGDP1225	QuarkXpress I	3
MGDP1235	Fundamentals of Digital Imaging	2
MGDP1240	Illustrator	3
MGDP1300	Digital Design Essentials	3
MGDP1325	QuarkXpress II	3
MGDP2000	Digital Publishing/Production	3
MGDP2010	Applied Graphic Design	3
MGDP2200	Design Portfolio	3
MPRT1200	Fundamentals of Printing	3
General Education Required		**8 Credits**
COMM2060	Small Group Communication	3
or		
COMM2130	Public Speaking	3
ENGL1025	Essentials of Technical Writing	2
PHIL2100	Critical Thinking	3

Technical Studies Elective **3 Credits**

Any MGDP, MMVP, or MPRT course that is not required for this award may be used as an elective.

Recommended:

MGDP2215	Graphic Design Internship	1-12

Total Diploma **64 Credits**

Diploma
Graphic Design - Web Design Emphasis (BP/EP)

Overview

This diploma is designed for individuals who wish to be involved in the design and implementation of web sites. Students will learn user interactivity and basic fundamentals of optimum Internet usage. These concepts are critical to the conception and design of a web site. The navigation, functionality, file size, image generation, and unity of design are stressed. Each student will design and develop a web portfolio or work as an intern in the industry as a requirement for graduation. There is an opportunity in this diploma to take electives in Computer Careers or Creative Graphic Design to enhance student skills.

Prerequisites: Testing score equivalent or CPLT1100 Introduction to to Personal Computers, CPLT1200 Introduction to Macintosh and MATH0900 Fundamentals of Mathematics.

Career Opportunities

Graphic design is an ever-changing and evolving professional career with many occupational categories and opportunities. One might find employment in a production environment, customer service, customer support, sales, creative production, consulting or training. Occupational titles include but are not limited to creative designer, graphic designer, print production artist, web designer, web producer, web developer, production artist, advertising artist, art typographer. Common working environments might include design or production, in a corporation, agency, advertising or marketing setting, printing company, or graphics service bureau.

Technical Studies Required		**41 Credits**
MGDP1220	Concepts in Creativity	3
MGDP1230	Photoshop	3
MMVP1515	Digital Media Technology	3
MPRT1210	Color Applications	3
CCIS1351	Advanced HTML using XHTML	4
MGDP1205	Fundamentals of Graphic Design	3
MGDP1240	Illustrator	3
MGDP1265	HTML using XHTML	3
MGDP1285	Fundamentals in Web Imaging	2
MGDP1320	Dreamweaver	3
MGDP1360	Acrobat	2
MGDP2100	Web Design/Production	3
MGDP2200	Design Portfolio	3
MMVP1520	Introduction to Flash	3
General Education Required		**8 Credits**
COMM2060	Small Group Communication	3
or		
COMM2130	Public Speaking	3
ENGL1025	Essentials of Technical Writing	2
PHIL2100	Critical Thinking	3
Technical Studies Elective		**15 Credits**

Any MADV, MGDP, MMVP, or MPRT course that is not required for this award may be used as an elective.

Recommended:

MGDP2215	Graphic Design Internship	1-12
Total Diploma		**64 Credits**

Diploma
Graphic Design - Production Emphasis (BP/EP)

Overview

This diploma is an in-depth Graphic Design Production that offers the student technical hands-on skills. Upon completion this student will have numerous opportunities for employment in the printing and communications industry. Students will receive industry specific training on software programs designed to produce print media and electronic communications material. Examples of such software include QuarkXPress, Illustrator, Photoshop and Acrobat. Training will be provided using different computerized systems, printers and desktop scanners to produce basic publications, ads, or print materials. If you are creative and enjoy producing magazine ads, publications, books, brochures and advertisements, forms, business cards, or invitations, this degree is designed for you. This diploma is focused on training the student for the production workforce within the printing and publishing industry.

Prerequisites: Testing score equivalent or CPLT1100 Introduction to to Personal Computers, CPLT1200 Introduction to Macintosh and MATH0900 Fundamentals of Mathematics.

Career Opportunities

Graphic design is an ever-changing and evolving professional career with many occupational categories and opportunities. One might find employment in a production environment, customer service, customer support, sales, creative production, consulting or training. Occupational titles include but are not limited to creative designer, graphic designer, print production artist, web designer, web producer, web developer, production artist, advertising artist, art typographer. Common working environments might include design or production, in a corporation, agency, advertising or marketing setting, printing company, or graphics service bureau.

Technical Studies Required		**40 Credits**
MGDP1220	Concepts in Creativity	3
MGDP1230	Photoshop	3
MMVP1515	Digital Media Technology	3
MPRT1210	Color Applications	3
MGDP1205	Fundamentals of Graphic Design	3
MGDP1225	QuarkXpress I	3
MGDP1235	Fundamentals of Digital Imaging	2
MGDP1240	Illustrator	3
MGDP1265	HTML using XHTML	3
MGDP1300	Digital Design Essentials	3
MGDP1325	QuarkXpress II	3
MGDP1360	Acrobat	2
MGDP2000	Digital Publishing/Production	3
MPRT1200	Fundamentals of Printing	3

General Education Required		**6 Credits**
PHIL2100	Critical Thinking	3
Choose 3 credits		
COMM2050	Interpersonal Communication	3
COMM2060	Small Group Communication	3
COMM2130	Public Speaking	3
ENGL1025	Essentials of Technical Writing	2
ENGL2120	Writing and Research	3
PHIL2200	Ethics	3
Technical Studies Elective		**5 Credits**

Any MADV, MGDP, MMVP, or MPRT course that is not required for this award may be used as an elective.

Recommended:		
MGDP2215	Graphic Design Internship	1-12
Total Diploma		**51 Credits**

Occupational Certificate Digital Production (BP/EP)

Overview

This certificate offers the student an overview of Graphic Design Production as it pertains to the printing and publishing industry. The coursework is designed to meet the needs of personnel already employed in the printing and publishing industry who wish to enhance their skills for job advancement or change. Students will complete introductory-level hands-on training to obtain the skills necessary for them to understand the various areas of digital production. They will learn software used in the industry, such as QuarkXPress, Illustrator and Photoshop.

Prerequisites: Testing score equivalent or CPLT1100 Introduction to to Personal Computers, CPLT1200 Introduction to Macintosh and MATH0900 Fundamentals of Mathematics.

Career Opportunities

Graphic design is an ever-changing and evolving professional career with many occupational categories and opportunities. One might find employment in a production environment, customer service, customer support, sales, creative production, consulting or training. Occupational titles include but are not limited to creative designer, graphic designer, print production artist, web designer, web producer, web developer, production artist, advertising artist, art typographer. Common working environments might include design or production, in a corporation, agency, advertising or marketing setting, printing company, or graphics service bureau.

Technical Studies Required		**17 Credits**
MGDP1205	Fundamentals of Graphic Design	3
MGDP1225	QuarkXpress I	3
MGDP1230	Photoshop	3
MGDP1235	Fundamentals of Digital Imaging	2
MGDP1240	Illustrator	3
MPRT1200	Fundamentals of Printing	3
Total Occupational Certificate		**17 Credits**

Occupational Certificate Production Technician for Digital Publishing (BP/EP)

Overview

Ever wonder how to produce a printed flyer, brochure, business card, letterhead or book? This certificate is designed for someone employed or self-employed in the publishing industry. The certificate is for the person who is a writer or works on the fringe of the printing and publishing industry and wants to acquire the skills necessary to produce their own printed materials.

Prerequisites: Testing score equivalent or CPLT1100 Introduction to to Personal Computers, CPLT1200 Introduction to Macintosh and MATH0900 Fundamentals of Mathematics.

Career Opportunities

Graphic design is an ever-changing and evolving professional career with many occupational categories and opportunities. One might find employment in a production environment, customer service, customer support, sales, creative production, consulting or training. Occupational titles include but are not limited to creative designer, graphic designer, print production artist, web designer, web producer, web developer, production artist, advertising artist, art typographer. Common working environments might include design or production, in a corporation, agency, advertising or marketing setting, printing company, or graphics service bureau.

Technical Studies Required		**28 Credits**
MGDP1205	Fundamentals of Graphic Design	3
MGDP1225	QuarkXpress I	3
MGDP1230	Photoshop	3
MGDP1235	Fundamentals of Digital Imaging	2
MGDP1240	Illustrator	3
MGDP1300	Digital Design Essentials	3
MGDP1325	QuarkXpress II	3
MGDP1360	Acrobat	2
MGDP2000	Digital Publishing/Production	3
MPRT1200	Fundamentals of Printing	3
Total Occupational Certificate		**28 Credits**

Occupational Certificate
Basic Web Technologies (BP/EP)

Overview

This certificate is designed for the student as an overview of Web Technologies. The coursework is designed to meet the needs of personnel already employed in a related industry who wish to enhance their skills for job advancement, change, or comprehension. Students will complete introductory-level coursework and obtain the skills necessary for them to understand the technologies related to web design and development.

Prerequisite: Basic computer literacy, familiarity with the Internet, college-level reading and communication ability, and proficiency in basic mathematics.

All students must pass the Computer Literacy assessment test before being admitted.

Career Opportunities

Web Design and Programming is an ever-changing and evolving professional career with many occupational categories and opportunities. One might find employment in a production environment, web development, web programming, customer service, customer support, sales, creative production, consulting or training.

Technical Studies Required		**17 Credits**
CCIS1301	HTML using XHTML	3
or		
MGDP1265	HTML using XHTML	3
CCIS1320	FrontPage	3
or		
MGDP1320	Dreamweaver	3
CCIS1515	Web Programming Overview	3
MGDP1205	Fundamentals of Graphic Design	3
MGDP1360	Acrobat	2
MMVP1590	Multimedia for the Web	3
Total Occupational Certificate		**17 Credits**

MultiMedia/Video Design and Production

Associate in Applied Science Degree
Multimedia Designer (BP)

Overview

The Multimedia Designer is responsible for the creative production of computer generated artwork and presentation materials. The designer must be able to use good written, verbal and visual communication skills, both with clients and other team members. Some jobs will require independent work and others will be part of a team effort. This production work may include CD ROMs, interactive programs, web graphics, ad design, 2D and 3D animations, video graphics and print materials.

Career Opportunities

Multimedia Designers with good artistic design skills are in high demand by media producers, film and animation companies, production houses, government agencies, printing houses, ad agencies, educational institutions and businesses who are engaged in local and global communications with outside customers or company employees.

Technical Studies Required		**51 Credits**
MMVP1500	Concepts of Multimedia	3
MMVP1505	Visual Media Design	3
MMVP1511	Production Planning	4
MMVP1515	Digital Media Technology	3
MMVP1520	Introduction to Flash	3
MMVP1536	Macromedia Director	4
MMVP1545	3D Studio Max	3
or		
MMVP2560	After Effects	3
MMVP1551	Digital Image Enhancement	3
MMVP1560	Audio for Media	3
MMVP1590	Multimedia for the Web	3
MMVP2570	Media Authoring	4
MMVP2641	Portfolio Production	3
MGDP1205	Fundamentals of Graphic Design	3
or		
MGDP1220	Concepts in Creativity	3
MGDP1230	Photoshop	3
MPRT1200	Fundamentals of Printing	3
MPRT1210	Color Applications	3
General Education Required		**18 Credits**
COMM2050	Interpersonal Communication	3
COMM2130	Public Speaking	3
ENGL2120	Writing and Research	3
ENGL2125	Technical Writing	3
or		
COMM2060	Small Group Communication	3
PHIL2100	Critical Thinking	3
PHIL2200	Ethics	3
Technical Studies Elective		**3 Credits**

Any MADV, MGDP, MMVP or MPRT course that is not required for this award may be used as an elective.

Recommended:

MMVP2630	Advanced Production Lab	1-8

Total Associate in Applied Science Degree **72 Credits**

Associate in Applied Science Degree Video Production Specialist (BP)

Overview

The Video Production Specialist will perform an ever-changing variety of tasks from writing scripts, shooting video and lighting, to digital non-linear editing. This person must have an understanding and ability to work with the latest technologies. Computers are a common tool and the Video Specialist must not only be creative, but have a technical grasp of new and evolving hardware and software applications as they relate to video.

Career Opportunities

A Video Production Specialist has the potential for finding employment in the following areas: video production and animation houses, multimedia, CD and web development companies, law firms, training departments in large and mid-size corporations, hospitals, television broadcast and cable stations. Related positions can also be found in sales as account executives for production companies or equipment rental suppliers/vendors.

Technical Studies Required		**50 Credits**
MMVP1500	Concepts of Multimedia	3
MMVP1505	Visual Media Design	3
MMVP1511	Production Planning	4
MMVP1515	Digital Media Technology	3
MMVP1560	Audio for Media	3
MMVP1600	Video Production Equipment	4
MMVP1605	Videography and Directing	4
MMVP2550	Video Field Production	3
MMVP2560	After Effects	3
MMVP2600	Digital Post Production	4
MMVP2605	Corporate Video Production	4
MMVP2610	Avid Non-Linear Editing	3
MMVP2641	Portfolio Production	3
MGDP1230	Photoshop	3
MPRT1210	Color Applications	3
General Education Required		**18 Credits**
COMM2050	Interpersonal Communication	3
COMM2130	Public Speaking	3
ENGL2120	Writing and Research	3
ENGL2125	Technical Writing	3
or		
COMM2060	Small Group Communication	3
PHIL2100	Critical Thinking	3
PHIL2200	Ethics	3
Technical Studies Elective		**4 Credits**

Any MADV, MGDP, MMVP, or MPRT course that is not required for this award may be used as an elective.

Recommended:

MMVP2630	Advanced Production Lab	1-8
	or	
MMVP2650	Multimedia/Video Production Internship	1-8

Total Associate in Applied Science Degree **72 Credits**

Diploma Video Production Specialist (BP)

Overview

The Video Production Specialist will perform an ever-changing variety of tasks from writing scripts, shooting video and lighting, to digital non-linear editing. This person must have an understanding and ability to work with the latest technologies. Computers are a common tool and the Video Specialist must not only be creative, but have a technical grasp of new and evolving hardware and software applications as they relate to video.

Career Opportunities

A Video Production Specialist has the potential for finding employment in the following areas: video production and animation houses, multimedia, CD and web development companies, law firms, training departments in large and mid-size corporations, hospitals, television broadcast and cable stations. Related positions can also be found in sales as account executives for production companies or equipment rental suppliers/vendors.

Technical Studies Required		**50 Credits**
MMVP1500	Concepts of Multimedia	3
MMVP1505	Visual Media Design	3
MMVP1511	Production Planning	4
MMVP1515	Digital Media Technology	3
MMVP1560	Audio for Media	3
MMVP1600	Video Production Equipment	4
MMVP1605	Videography and Directing	4
MMVP2550	Video Field Production	3
MMVP2560	After Effects	3
MMVP2600	Digital Post Production	4
MMVP2605	Corporate Video Production	4
MMVP2610	Avid Non-Linear Editing	3
MMVP2641	Portfolio Production	3
MGDP1230	Photoshop	3
MPRT1210	Color Applications	3
General Education Required		**9 Credits**
COMM1016	Teambuilding in the Workplace	2
COMM1040	Job Seeking Skills	2
COMM2130	Public Speaking	3
ENGL1025	Essentials of Technical Writing	2
or		
MATH1000	Prealgebra	2
Technical Studies Elective		**5 Credits**

Any MADV, MGDP, MMVP, or MPRT course that is not required for this award may be used as an elective.

Recommended:

MMVP2630	Advanced Production Lab	1-8
or		
MMVP2650	Multimedia/Video Production Internship	1-8

Total Diploma **64 Credits**

Diploma
Multimedia Designer (BP)

Overview

The Multimedia Designer is responsible for the creative production of computer generated artwork and presentation materials. The designer must be able to use good written, verbal and visual communication skills, both with clients and other team members. Some jobs will require independent work and others will be part of a team effort. This production work may include CD ROMs, interactive programs, web graphics, ad design, 2D and 3D animations, video graphics and print materials.

Career Opportunities

Multimedia Designers with good artistic design skills are in high demand by media producers, film and animation companies, production houses, government agencies, printing houses, ad agencies, educational institutions and businesses who are engaged in local and global communications with outside customers or company employees.

Technical Studies Required		**51 Credits**
MMVP1500	Concepts of Multimedia	3
MMVP1505	Visual Media Design	3
MMVP1511	Production Planning	4
MMVP1515	Digital Media Technology	3
MMVP1520	Introduction to Flash	3
MMVP1536	Macromedia Director	4
MMVP1545	3D Studio Max	3
or		
MMVP2560	After Effects	3
MMVP1551	Digital Image Enhancement	3
MMVP1560	Audio for Media	3
MMVP1590	Multimedia for the Web	3
MMVP2570	Media Authoring	4
MMVP2641	Portfolio Production	3
MGDP1205	Fundamentals of Graphic Design	3
or		
MGDP1220	Concepts in Creativity	3
MGDP1230	Photoshop	3
MPRT1200	Fundamentals of Printing	3
MPRT1210	Color Applications	3
General Education Required		**9 Credits**
COMM1016	Teambuilding in the Workplace	2
COMM1040	Job Seeking Skills	2
COMM2130	Public Speaking	3
ENGL1025	Essentials of Technical Writing	2
or		
MATH1000	Prealgebra	2

Technical Studies Elective **4 Credits**

Any MADV, MGDP, MMVP, or MPRT course that is not required for this award may be used as an elective.

Recommended:

MMVP2630	Advanced Production Lab	1-8

Total Diploma **64 Credits**

Occupational Certificate
Audio/Visual Specialist (BP)

Overview

This certificate provides training for setup, operation and preventative maintenance of multimedia equipment including sound systems, video and computer presentation equipment, speaker support and lighting equipment. These positions often require communication with presenters and other personnel to facilitate the use of media. It is necessary to have good problem-solving skills, work well under pressure and have the ability to lift and move heavy equipment.

Career Opportunities

Primary employers include conference and convention centers, hotels and rental agencies, but any company or educational institution that has presentation facilities may also be a possible employer. Schedules may vary because of the seven day per week, as well as, the evening operation of those facilities.

Technical Studies Required		**18 Credits**
MMVP1515	Digital Media Technology	3
MMVP1536	Macromedia Director	4
MMVP1600	Video Production Equipment	4
MMVP2550	Video Field Production	3
MMVP2600	Digital Post Production	4
General Education Required		**4 Credits**
COMM1016	Teambuilding in the Workplace	2
COMM1040	Job Seeking Skills	2

Technical Studies Elective **4 Credits**

Any MADV, MGDP, MMVP, or MPRT course that is not required for this award may be used as an elective.

Recommended:

MMVP2650	Multimedia/Video Production Internship	1-8

Total Occupational Certificate **26 Credits**

Printing & Prepress Technology

Associate in Applied Science Degree
Printing and Prepress Technology (BP)

Overview

The explosion of color printing and computer usage in the printing industry in recent years has created a demand for highly skilled individuals trained in the area of digital color prepress. Color copy such as photographs, transparencies and digital images must be prepared for the printing processes before they can be reproduced. Pictures must be scanned, color corrected and images enhanced or manipulated. Pages of copy must be imposed or stripped on the computer and them output to film or sent directly to plates. Students will learn the techniques of high quality image scanning, tone control, color correction and digital proofing as well as electronic imposition software and theories about color reproduction and control. Students who pursue this degree will enter into the new digital age of the printing industry with a clear understanding of color, image manipulation and page imposition.

Career Opportunities

Students who pursue this degree will be prepared to work in today's printing industry.

Technical Studies Required		**50 Credits**
MGDP1205	Fundamentals of Graphic Design	3
MGDP1220	Concepts in Creativity	3
MGDP1225	QuarkXpress I	3
MGDP1230	Photoshop	3
MGDP1235	Fundamentals of Digital Imaging	2
MGDP1240	Illustrator	3
MMVP1515	Digital Media Technology	3
MPRT1200	Fundamentals of Printing	3
MPRT1210	Color Applications	3
MPRT1218	Image Assembly and Proofing	3
MPRT1245	Offset Press Operations I	3
MPRT1250	Bindery/Finishing Operations	3
MPRT1305	Skill Applications for Printing and Prepress	3
MPRT1345	Offset Press Operations II	3
MPRT1361	Computer Imposition	3
MPRT1376	PDF Work Flow	3
MPRT2212	Professional Scanning	3
General Education Required		**12 Credits**
ENGL2120	Writing and Research	3
COMM2060	Small Group Communication	3
PHIL2100	Critical Thinking	3
SSCI2100	Introduction to Sociology	3

General Education Elective **6 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective **4 Credits**

Any MADV, MGDP, MMVP, or MPRT course that is not required this award may be used as an elective.

Total Associate in Applied Science Degree **72 Credits**

Diploma
Printing and Prepress Technology (BP)

Overview

The explosion of color printing and computer usage in the printing industry in recent years has created a demand for highly skilled individuals trained in the area of digital color prepress. Color copy such as photographs, transparencies and digital images must be prepared for the printing processes before they can be reproduced. Pictures must be scanned, color corrected and images enhanced or manipulated. Pages of copy must be imposed or stripped on the computer and them output to film or sent directly to plates. Students will learn the techniques of high quality image scanning, tone control, color correction and digital proofing as well as electronic imposition software and theories about color reproduction and control. Students who pursue this diploma will enter into the new digital age of the printing industry with a clear understanding of color, image manipulation and page imposition.

Career Opportunities

Students who pursue this diploma will be prepared to work in today's printing industry.

Technical Studies Required		**47 Credits**
MGDP1205	Fundamentals of Graphic Design	3
MGDP1220	Concepts in Creativity	3
MGDP1225	QuarkXpress I	3
MGDP1230	Photoshop	3
MGDP1235	Fundamentals of Digital Imaging	2
MGDP1240	Illustrator	3
MMVP1515	Digital Media Technology	3
MPRT1200	Fundamentals of Printing	3
MPRT1210	Color Applications	3
MPRT1218	Image Assembly and Proofing	3
MPRT1245	Offset Press Operations I	3
MPRT1250	Bindery/Finishing Operations	3
MPRT1345	Offset Press Operations II	3
MPRT1361	Computer Imposition	3
MPRT1376	PDF Work Flow	3
MPRT2212	Professional Scanning	3

General Education Required		9 Credits
COMM2060	Small Group Communication	3
PHIL2100	Critical Thinking	3
SSCI2100	Introduction to Sociology	3

General Education Elective **2 Credits**

Any HTC college level general education course may be used to satisfy the elective requirement.

Technical Studies Elective **6 Credits**

Any MADV, MGDP, MMVP, or MPRT course that is not required this award may be used as an elective.

Total Diploma **64 Credits**

Occupational Certificate Press Technician (BP)

Overview

In today's high-tech, fast-paced world of digital color printing a key entry-level job is the color proofer. Proofs are the prepress examples which a customer must approve before the printing process can continue. A skilled worker in this area is capable of producing proofs through photographic methods or digital proofs. A knowledge of proofing and film output machines and how to calibrate and linearize them is as cr ucial as a good eye for color and quality control.

Career Opportunities

Students who pursue this certificate are preparing themselves for a common entry-level position in today's printing industry.

Technical Studies Required		24 Credits
MGDP1205	Fundamentals of Graphic Design	3
MPRT1200	Fundamentals of Printing	3
MPRT1210	Color Applications	3
MPRT1218	Image Assembly and Proofing	3
MPRT1245	Offset Press Operations I	3
MPRT1250	Bindery/Finishing Operations	3
MPRT1305	Skill Applications for Printing and Prepress	3
MPRT1345	Offset Press Operations II	3

Technical Studies Elective **6 Credits**

Any MADV, MGDP, MMVP, or MPRT course that is not required this award may be used as an elective.

Total Occupational Certificate **30 Credits**

Occupational Certificate Offset Press/Duplicator Operator (BP)

Overview

In just one semester, by attending school virtually every day, the student can complete this certificate and have the opportunity to work in the much needed press/bindery areas of printing companies. The Press/Duplicator Operator Certificate provides the training needed to work in today's modern print shop. Course work includes hands-on training using moder n equipment and the latest techniques. Platemaking, equipment maintenance, color principles and quality control are also covered.

Career Opportunities

Students completing this certificate are preparing themselves for employment within the printing industry in the press/bindery areas.

Technical Studies Required		15 Credits
MPRT1200	Fundamentals of Printing	3
MPRT1245	Offset Press Operations I	3
MPRT1250	Bindery/Finishing Operations	3
MPRT1210	Color Applications	3
or		
MPRT1305	Skill Applications for Printing and Prepress	3
MPRT1345	Offset Press Operations II	3

Total Occupational Certificate **15 Credits**

Professional Photography

Associate in Applied Science Degree Professional Photography Technology (EP)

Overview

The Professional Photography Technology Associate in Applied Science Degree is an in-depth Photography Program. The curriculum for the Professional Photography Technology degree is designed to develop the aspiring photographer's shooting skills, with emphasis on building technical abilities as well as the liberal education studies. Persistence and motivation are keys to securing employment and advancement.

Career Opportunities

The courses of study in the Professional Photography Technology degree are designed to train the graduate for an entry-level position as a well rounded professional photographer with the ability to think through and solve the many technical and esthetic problems associated with this very conceptual and inventive career field. As a photographer's assistant or photographer, job opportunities exist in large corporate and industrial settings as well as privately owned studios.

Technical Studies Required		**47 Credits**
PRPO1010	Introduction to 35mm Camera Operations	3
PRPO1030	Black and White Photography	3
PRPO1050	Ambient Lighting Controls	2
PRPO1070	Photographic Design	3
PRPO1170	Photographer's Assistant	3
PRPO1220	Basic Color Printing	3
PRPO1200	Studio Lighting	3
or		
PRPO1240	Beginning Portraiture	3
PRPO1260	Medium Format Photography	3
or		
PRPO1280	Large Format Photography	3
PRPO1400	Digital Darkroom	3
PRPO2200	Digital Photography	3
PRPO2400	Intermediate Portraiture	3
or		
PRPO2430	Advertising Photography	3
PRPO2410	Business of Photography	2
PRPO2420	Product Photography	3
or		
PRPO2530	Advanced Portraiture	3
PRPO2460	Wedding Photography	3
or		
PRPO2510	Advanced Studio Photography	3
PRPO2580	Professional Photography Internship I	2
PRPO2820	Commercial Portfolio	3
or		
PRPO2860	Portrait/Wedding Portfolio	3
MATH1000	Prealgebra	2

General Education Required		**12 Credits**
COMM2050	Interpersonal Communication	3
CPLT1200	Introduction to Macintosh	3
ENGL2120	Writing and Research	3
PHIL2100	Critical Thinking	3

General Education Elective **6 Credits**

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Technical Studies Elective **3 Credits**

Any PRPO course that is not required for this award may be used as an elective.

Total Associate in Applied Science Degree **68 Credits**

Diploma Commercial Photography (EP)

Overview

The commercial photographer needs a comprehensive photographic education covering every aspect of photography. The commercial photographer must be able to "think on their feet" to solve technical photographic problems quickly and cost effectively. The commercial photographer is required to work directly with clients, art directors, studio managers, photographer assistants and acts as the pivotal point in creating exciting photography that "sells". Commercial photography is a very broad field and may include specialization in such areas as architectural, food, fashion, model portfolios, catalogs, public relations or advertising photography to name a few. Personal qualities considered essential for this occupation are the ability to work well with others, highly self motivated with good problem-solving abilities and excellent oral and written communication skills.

Career Opportunities

The courses of study in the Commercial Photography diploma are designed to prepare the graduate for an entry-level position as a photographer's assistant in a commercial photography studio. With increased experience an individual may become a staff photographer or build their own business as an independent commercial photography studio.

Technical Studies Required		48 Credits
PRPO1010	Introduction to 35mm Camera Operations	3
PRPO1030	Black and White Photography	3
PRPO1050	Ambient Lighting Controls	2
PRPO1070	Photographic Design	3
PRPO1170	Photographer's Assistant	3
PRPO1200	Studio Lighting	3
PRPO1220	Basic Color Printing	3
PRPO1260	Medium Format Photography	3
PRPO1280	Large Format Photography	3
PRPO1400	Digital Darkroom	3
PRPO2200	Digital Photography	3
PRPO2410	Business of Photography	2
PRPO2420	Product Photography	3
PRPO2430	Advertising Photography	3
PRPO2510	Advanced Studio Photography	3
PRPO2820	Commercial Portfolio	3
PRPO2580	Professional Photography Internship I	2
General Education Required		**8 Credits**
COMM1040	Job Seeking Skills	2
CPLT1200	Introduction to Macintosh	3
MATH1000	Prealgebra	2
SSCI1000	Introduction to Environmental Health and Safety	1
Technical Studies Elective		**6 Credits**

Any PRPO course that is not required for this award may be used as an elective.

Total Diploma **62 Credits**

Diploma
Portrait and Wedding Photography 130.2304 (EP)

Overview

The portrait and wedding photographer needs a sound photographic education with special emphasis on people skills, good personal sales ability and a strong sense of "dynamic timing" coupled with studio and location lighting skills. Portrait/wedding photographers work one-on-one with clients and often on weddings with photographer assistants. Portraiture can be general in nature or may offer a broad scope of specialization within the field. Some of the specialization could include such areas as glamour, classical, casual, romantic, fantasy, fad, illustrative or humorous styles of portraiture.

Career Opportunities

The courses of study in the Portrait and Wedding Photography diploma are designed to prepare the graduate for many exciting career options, including working as an assistant in an established portrait and wedding photography studio, working in a large scale corporate portrait studio system or, with additional experience, setting up their own studio.

Technical Studies Required		45 Credits
PRPO1010	Introduction to 35mm Camera Operations	3
PRPO1030	Black and White Photography	3
PRPO1050	Ambient Lighting Controls	2
PRPO1070	Photographic Design	3
PRPO1170	Photographer's Assistant	3
PRPO1220	Basic Color Printing	3
PRPO1240	Beginning Portraiture	3
PRPO1260	Medium Format Photography	3
PRPO1400	Digital Darkroom	3
PRPO2200	Digital Photography	3
PRPO2400	Intermediate Portraiture	3
PRPO2410	Business of Photography	2
PRPO2460	Wedding Photography	3
PRPO2530	Advanced Portraiture	3
PRPO2580	Professional Photography Internship I	2
PRPO2860	Portrait/Wedding Portfolio	3
General Education Required		**8 Credits**
CPLT1200	Introduction to Macintosh	3
COMM1040	Job Seeking Skills	2
MATH1000	Prealgebra	2
SSCI1000	Introduction to Environmental Health and Safety	1
Technical Studies Elective		**6 Credits**

Any PRPO course that is not required for this award may be used as an elective.

Total Diploma **59 Credits**

Service CAREERS

Child Development Careers

Associate in Applied Science Degree	Child Development (BP/EP)	62 Credits	Page 98
Diploma	Child Development (BP/EP)	32 Credits	Page 98

Culinary Arts

Associate in Applied Science Degree	Culinary Arts (BP/EP)	66 Credits	Page 99
Diploma	Culinary Arts (BP/EP)	52 Credits	Page 99
Occupational Certificate	Culinary Assistant (BP/EP)	16 Credits	Page 100

Emergency Management

Advanced Technical Certificate	Emergency Management Hopkins Tech Center	20 Credits	Page 101

Environmental Health and Safety

Occupational Certificate	Hazardous Materials Technology (Hopkins Tech Center)	10 Credits	Page 101

Fire Protection

Associate in Applied Science Degree	Fire Science Technology (Hopkins Tech Center)	72 Credits	Page 101
Diploma	Fire Protection Technician (Hopkins Tech Center)	48 Credits	Page 102
Advanced Technical Certificate	Company Officer (Hopkins Tech Center)	13 Credits	Page 102
Occupational Certificate	Fire Suppression Technician (Hopkins Tech Center)	24 Credits	Page 103
Occupational Certificate	Fire Inspection/Investigation (Hopkins Tech Center)	10 Credits	Page 103
Occupational Certificate	Hazardous Materials (Hopkins Tech Center)	15 Credits	Page 103

Service
CAREERS

Child Development Careers

Associate in Applied Science Degree
Child Development (BP/EP)

Overview
This degree is designed to prepare individuals for employment in a variety of early child care and educational settings as teachers, family child care providers or nannies. Persons working in this profession provide a healthy, safe and developmentally appropriate environment in support of families. Students learn how to plan age appropriate activities which recognize the diversity of children and families. This degree expands the student's knowledge of child development in areas of communication, writing and developmental skills. Many employers recognize the benefit from this extensive training and require this degree from their employed teacher.

Career Opportunities
Job opportunities are available in child care centers, special needs programs, in home care (nanny), family child care, schoolage care, recreational and parent/child programs.

Technical Studies Required		**39 Credits**
CHLD1100	Child Care as a Profession	2
CHLD1125	Guiding Children's Behavior	3
CHLD1150	Literature and Language for Children	3
CHLD1175	Creative Activities	2
CHLD1500	Child Growth and Development	3
CHLD1525	Health, Safety and Nutrition	2
CHLD1550	Cognitive Activities	2
CHLD1575	Music and Movement Activities	2
CHLD1700	Practicum - Lab Preschool	3
CHLD1725	Practicum - Special Needs	3
CHLD1750	Practicum - Choice	3
CHLD2000	Integrating Children with Special Needs	3
CHLD2026	Professional Leadership	3
CHLD2075	Family and Community Issues	3
CHLD2100	Child Abuse and Neglect	2

General Education Required		**12 Credits**
COMM2050	Interpersonal Communication	3
or		
COMM2060	Small Group Communication	3
PHIL2100	Critical Thinking	3
or		
PHIL2200	Ethics	3
SSCI2100	Introduction to Sociology	3
SSCI2300	General Psychology	3

General Education Elective **6 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective		**5 Credits**
CHLD1900	Specialized Lab	1-4
CHLD2050	Supporting Children's Play	2
CHLD2126	Caring for Infants and Toddlers	3
CHLD2226	Caring for Preschool Children	3
CHLD2251	Caring for School-Age Children	3
CHLD2301	Curriculum Planning for the Whole Child	1
CHLD2325	Storytelling Props	1
CHLD2525	Advanced Cognitive Activities	1
COMM1100	American Sign Language, Deaf Culture I	2
SSCI1020	CPR/First Aid	1

Total Associate in Applied Science Degree **62 Credits**

Diploma
Child Development (BP/EP)

Overview
This diploma provides students with the skills necessary to work in a variety of child care careers. Skills to be developed include planning age appropriate activities which recognize the diversity of children and families. In addition, students will practice guidance techniques and supervise snack, cleanup and other daily routines to provide for a safe and healthy environment.

Career Opportunities
Job opportunities are available in child care centers, special needs programs, in home care (nanny), family child care, schoolage care, recreational and parent/child programs.

Technical Studies Required		**25 Credits**
CHLD1100	Child Care as a Profession	2
CHLD1125	Guiding Children's Behavior	3
CHLD1150	Literature and Language for Children	3
CHLD1175	Creative Activities	2
CHLD1500	Child Growth and Development	3
CHLD1525	Health, Safety and Nutrition	2
CHLD1550	Cognitive Activities	2
CHLD1575	Music and Movement Activities	2
CHLD1700	Practicum - Lab Preschool	3
CHLD1750	Practicum - Choice	3

General Education Elective **4 Credits**

Any HTC college level general education course may be used to satisfy the elective requirement.

Technical Studies Elective		3 Credits
CHLD1725	Practicum - Special Needs	3
CHLD1900	Specialized Lab	1-4
CHLD2000	Integrating Children with Special Needs	3
CHLD2026	Professional Leadership	3
CHLD2075	Family and Community Issues	3
CHLD2100	Child Abuse and Neglect	2
CHLD2126	Caring for Infants and Toddlers	3
CHLD2226	Caring for Preschool Children	3
Total Diploma		**32 Credits**

Culinary Arts

Associate in Applied Science Degree Culinary Arts (BP/EP)

Overview

The Culinary Arts A.A.S. degree prepares individuals for career opportunities in hotels, restaurants, clubs and institutional food service facilities. Responsibilities may include menu planning, purchasing food, equipment, and supplies, selecting, and developing recipes, selecting and using various food preparation methods and techniques. Management duties may include, but are not limited to financial planning, hiring, training and supervising employees.

Career Opportunities

Employment may be found in hotels, restaurants, clubs, health care facilities, schools, resorts and many other food related operations. Depending on qualifications and experience positions are available to graduates such as restaurant cooks, banquet cooks, bakers, assistant pastry chefs, pantry personnel, kitchen managers, food salespersons, personal chefs, purchasing clerks, caterers, and entry-level chef/managers upon course completion. Students who complete the Culinary Arts diploma program are eligible to pursue American Culinary Federation certification. The American Culinary Federation accrediting commission nationally accredits the curriculum at Hennepin Technical College. The Culinary Arts program is a ProMgmt® partner of the National Restaurant Association Educational Foundation.

Technical Studies Required		45 Credits
CULA1105	Introduction to Culinary Arts	3
CULA1115	Foodservice Sanitation and Safety	2
CULA1125	Basic Baking and Pastry	3
CULA1135	Basic Pantry and Garde Manger	3
CULA1145	Protein Fabrication and Charcuterie	1
CULA1155	Basic Cooking Principles and Processes	4
CULA1200	Garde Manger	1
CULA1210	Baking Production Foods	4
CULA1220	Pantry Production Foods	4
CULA1230	Range Production Foods	4
CULA1240	Dining Room Service	4
CULA1301	Culinary Arts Nutrition	2
CULA1311	Supervisory Management	2
CULA1321	Decorative Work and Showpieces	2
CULA1331	Purchasing and Menu Design	2
CULA1340	Quantity Foods and Internship	2
MATH1000	Prealgebra	2
General Education Required		**9 Credits**
COMM2050	Interpersonal Communication	3
PHIL2100	Critical Thinking	3
or		
PHIL2200	Ethics	3
SSCI2100	Introduction to Sociology	3
or		
SSCI2200	Principles of Microeconomics	3
General Education Elective		**9 Credits**

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Technical Studies Elective		3 Credits
CULA1501	Seasonal/Specialty Menus and Wines	3
CULA1510	Topics of Global Cuisine	3
CULA1520	Cuisine of the Americas	3
CULA1900	Specialized Lab	1-4
CULA2100	Guest Service Management	3
CULA2110	Hospitality Marketing and Sales	3
CULA2120	Catering Management	3
CULA2140	Food, Beverage and Labor Cost Controls	3
CULA2150	Bar and Beverage Management	3
CULA2160	Hospitality Law	3
CULA2170	Facilities Design and Maintenance	3
Total Associate in Applied Science Degree		**66 Credits**

Diploma Culinary Arts (BP/EP)

Overview

The Culinary Arts diploma prepares individuals for career opportunities in hotels, restaurants, clubs and institutional food service operations. Responsibilities may include menu planning, purchasing food, equipment, and supplies, selecting and developing recipes, selecting and using various food preparation methods and techniques. Management duties may include, but are not limited to financial planning, hiring, training and supervising employees.

Career Opportunities
Employment may be found in hotels, restaurants, clubs, health care facilities, schools, resorts and many other food related operations. Depending on qualifications and experience numerous positions are available to graduates such as restaurant cooks, banquet cooks, bakers, assistant pastry chefs, pantry personnel, kitchen managers, food salespersons, personal chefs, purchasing clerks, caterers, and entry-level chef/managers upon course completion. Students who complete the Culinary Arts diploma program are eligible to pursue American Culinary Federation certification. The American Culinary Federation accrediting commission nationally accredits the curriculum at Hennepin Technical College. The Culinary Arts program is a ProMgmt® partner of the National Restaurant Association Educational Foundation.

Technical Studies Required		**43 Credits**
CULA1105	Introduction to Culinary Arts	3
CULA1115	Foodservice Sanitation and Safety	2
CULA1125	Basic Baking and Pastry	3
CULA1135	Basic Pantry and Garde Manger	3
CULA1145	Protein Fabrication and Charcuterie	1
CULA1155	Basic Cooking Principles and Processes	4
CULA1200	Garde Manger	1
CULA1210	Baking Production Foods	4
CULA1220	Pantry Production Foods	4
CULA1230	Range Production Foods	4
CULA1240	Dining Room Service	4
CULA1301	Culinary Arts Nutrition	2
CULA1311	Supervisory Management	2
CULA1321	Decorative Work and Showpieces	2
CULA1331	Purchasing and Menu Design	2
CULA1340	Quantity Foods and Internship	2
General Education Required		**6 Credits**
COMM1040	Job Seeking Skills	2
COMM1050	Communication in the Workplace	2
MATH1000	Prealgebra	2
Technical Studies Elective		**3 Credits**
CULA1501	Seasonal/Specialty Menus and Wines	3
CULA1510	Topics of Global Cuisine	3
CULA1520	Cuisine of the Americas	3
CULA1900	Specialized Lab	1-4
CULA2100	Guest Service Management	3
CULA2110	Hospitality Marketing and Sales	3
CULA2120	Catering Management	3
CULA2140	Food, Beverage and Labor Cost Controls	3
CULA2150	Bar and Beverage Management	3
CULA2160	Hospitality Law	3
CULA2170	Facilities Design and Maintenance	3
Total Diploma		**52 Credits**

Occupational Certificate
Culinary Assistant (BP/EP)

Overview
Completion of this certificate will prepare students who are primarily interested in immediate entry-level employment in the food service industry. Areas of study will include, but are not limited to: food service related mathematics, weights and measures, use of knives and foodservice equipment, product identification, basic baking techniques, product fabricating, preparations of stocks, sauces and soups and fundamental cooking methods and techniques.

Career Opportunities
Career opportunities exist in a variety of food service operations such as health care and family style restaurants. Depending on your skill level and knowledge, you may seek employment as a line cook, cooks' helper, baker and/or pastry chefs' assistant, pantry worker, and fry or vegetable cook. Completion of this certificate will provide you with a solid, although limited, foundation on which to build your culinary career.

Technical Studies Required		**16 Credits**
CULA1105	Introduction to Culinary Arts	3
CULA1115	Foodservice Sanitation and Safety	2
CULA1125	Basic Baking and Pastry	3
CULA1135	Basic Pantry and Garde Manger	3
CULA1145	Protein Fabrication and Charcuterie	1
CULA1155	Basic Cooking Principles and Processes	4
Total Occupational Certificate		**16 Credits**

Emergency Management

Advanced Technical Certificate Emergency Management (Hopkins Tech Center)

Overview
The Emergency Management Advanced Technical Certificate will prepare the students to direct or work in a city, county, or state Emergency Management program. The students will complete Federal and State required courses, which will lead to certification as a Minnesota Emergency Management director.

Career Opportunities
This certificate along with State certification will complete requirements for the students to work as part of a State or local Emergency Management team.

Technical Studies Required		**20 Credits**
EMGT1100	Orientation to Emergency Management	3
EMGT1105	Introduction to Planning and Mitigation	3
EMGT1110	Emergency Management Command and Control	4
EMGT1115	Community Disaster Exercises	4
EMGT1120	Emergency Management Leadership and Communications	3
EMGT1125	Emergency Management Resource Management	3
Total Advanced Technical Certificate		**20 Credits**

Environmental Health and Safety

Occupational Certificate Hazardous Materials Technology (Hopkins Tech Center)

Overview
This certificate is designed to develop basic applied skills required for management of hazardous materials and wastes in the industrial environment. This program is designed to develop minimum entry-level skills and knowledge for individuals working with these materials.

Career Opportunities
Hazardous Materials Technology graduates find employment in the areas of emergency response and hazardous materials/waste management.

Technical Studies Required		**10 Credits**
ENHS1110	Chemistry of Hazardous Materials	3
ENHS1120	Hazardous Materials Management and Handling	1
ENHS1130	Personal Protective Equipment	2
ENHS1140	Incident Management for Business and Industry	1
ENHS1150	HAZWOPER	3
Total Occupational Certificate		**10 Credits**

Fire Protection

Associate in Applied Science Degree Fire Science Technology (Hopkins Tech Center)

Overview
The A.A.S. degree in Fire Science Technology prepares students to perform the duties of a line officer. As students progress, they will also complete the requirements for two certificates; Fire Suppression Technician and Company Officer. Students typically complete the Fire Suppression Technician certificate first which qualifies them for a lead firefighter position with most fire departments. As students gain experience and continue their education they will earn a Company Officer certificate. The course work also prepares students to take promotional exams.

Career Opportunities
Fire Science graduates may perform a variety of jobs in the fire protection family. Titles may include Firefighter, Driver Operator, Inspector or Fire Investigator. Higher level positions, requiring experience and exams, are Fire Marshal, Lieutenant, Captain, District Chief, Deputy Chief, Assistant Chief and Chief of Department.

Technical Studies Required		**48 Credits**
FRPT1100	Fire Fighter I	5
FRPT1105	Fire Fighter II	2
FRPT1130	Fire Inspector Basic	2
FRPT1136	Introduction to Fire Protection	2
FRPT1140	Fire Department Administration Basic	2
FRPT1150	Incident Management	2
FRPT1155	Fire Sprinkler Design and Application	2
FRPT1161	Building Construction for Fire Service	3
FRPT1165	Apparatus Operator	3
FRPT1175	Hazardous Materials First Responder Operational	3
FRPT1180	Hazardous Materials Technician	3
FRPT2135	Fire Department Administration Advanc.	3
FRPT2140	Managing Fire Department Personnel	3
EMGT1100	Orientation to Emergency Management	3
Choose 10 credits from the following:		
FRPT1110	Fire Instructor Basic	2
FRPT1115	Company Functions	2
FRPT1120	Line Officer Basic	2
FRPT1125	Fire Investigation Basic	2
FRPT2105	Fire Instructor Advanced	2
FRPT2110	Fire Ground Control	2
FRPT2115	Line Officer Advanced	2
FRPT2120	Fire Investigation Advanced	2
FRPT2125	Fire Inspector Advanced	2

General Education Required		**18 Credits**
COMM2130	Public Speaking	3
COMM2050	Interpersonal Communication	3
or		
COMM2060	Small Group Communication	3
CPLT1100	Introduction to Personal Computers	3
or		
CPLT1200	Introduction to Macintosh	3
ENGL2120	Writing and Research	3
or		
ENGL2125	Technical Writing	3
PHIL2100	Critical Thinking	3
or		
PHIL2200	Ethics	3
SSCI2100	Introduction to Sociology	3
or		
SSCI2300	General Psychology	3
Technical Studies Elective		**6 Credits**
EMSV1100	Emergency Medical Technician - Basic	6
FRPT2200	Hazardous Materials Specialty Safety Officer	1
FRPT2205	Hazardous Materials Specialty Hazard Sector Officer	1
FRPT2210	Specialized Monitoring	1
FRPT2215	Hazardous Materials Specialty Containers	1
FRPT2220	Hazardous Materials Specialty Flammables - Solids, Liquids, Gases	1
FRPT2225	Hazardous Materials Specialty Corrosive and Toxic	1
FRPT2230	Hazardous Materials Specialty Poisons, Radioactives and Explosives	1
FRPT2235	Specialty Mitigation I	1
FRPT2240	Specialty Mitigation II	1
Total Associate in Applied Science Degree		**72 Credits**

Diploma
Fire Protection Technician
(Hopkins Tech Center)

Overview

The Fire Protection Technician diploma is designed to provide students with the skills necessary to progress in the fire service field. Fire suppression techniques and company officer training will be covered.

Career Opportunities

Students who complete this diploma will have the knowledge and skills necessary to serve as a lead firefighter, apparatus operator and line officer.

Technical Studies Required		**38 Credits**
FRPT1100	Fire Fighter I	5
FRPT1105	Fire Fighter II	2
FRPT1110	Fire Instructor Basic	2
FRPT1115	Company Functions	2
FRPT1120	Line Officer Basic	2
FRPT1125	Fire Investigation Basic	2
FRPT1130	Fire Inspector Basic	2
FRPT1136	Introduction to Fire Protection	2
FRPT1140	Fire Department Administration Basic	2
FRPT1150	Incident Management	2
FRPT1155	Fire Sprinkler Design and Application	2
FRPT1161	Building Construction for the Fire Service	3
FRPT1165	Apparatus Operator	3
FRPT1175	Hazardous Materials First Responder Operational	3
FRPT2110	Fire Ground Control	2
FRPT2115	Line Officer Advanced	2
General Education Required		**4 Credits**
COMM1050	Communication in the Workplace	2
COMM1040	Job Seeking Skills	2

General Education Elective **2 Credits**

Any HTC college level general education course may be used to satisfy the elective requirement.

Technical Studies Elective **4 Credits**

Any FRPT course that is not required for this award may be used as an elective.

EMSV1100	Emergency Medical Technician - Basic	6
Total Diploma		**48 Credits**

Advanced Technical Certificate
Company Officer
(Hopkins Tech Center)

Overview

This certificate prepares firefighters to be able to perform the duties of a company officer. This will include the areas of basic management, tactics, inspection, fire investigation and incident management which meets the requirements of NFPA 1021.

Prerequisite: Graduate of the Fire Suppression Certificate or equivalent.

Career Opportunities

Fire fighters who complete this certificate are qualified to perform company officer duties.

Technical Studies Required		**13 Credits**
FRPT1110	Fire Instructor Basic	2
FRPT1120	Line Officer Basic	2
FRPT1125	Fire Investigation Basic	2
or		
FRPT1130	Fire Inspector Basic	2
FRPT1161	Building Construction for the Fire Service	3
FRPT2110	Fire Ground Control	2
FRPT2115	Line Officer Advanced	2
Total Advanced Technical Certificate		**13 Credits**

Occupational Certificate
Fire Suppression Technician
(Hopkins Tech Center)

Overview

The Fire Suppression Technician certificate will prepare the student to perform lead firefighter and apparatus operator functions. Students learn firefighter techniques, company functions, hazardous materials functions and emergency medical procedures. Team work is emphasized throughout the program.

Career Opportunities

This certificate completes the job entry requirements as a firefighter for most fire departments.

Technical Studies Required		**24 Credits**
EMSV1100	Emergency Medical Technician - Basic	6
FRPT1100	Fire Fighter I	5
FRPT1105	Fire Fighter II	2
FRPT1115	Company Functions	2
FRPT1161	Building Construction for the Fire Service	3
FRPT1165	Apparatus Operator	3
FRPT1175	Hazardous Materials First Responder Operational	3
Total Occupational Certificate		**24 Credits**

Occupational Certificate
Fire Inspection/Investigation
(Hopkins Tech Center)

Overview

This certificate prepares firefighters, building officials, building inspectors, insurance inspectors, electrical engineers and lawyers to be able to perform fire inspections and investigations. It meets the requirements of NFPA 102 and 1031.

Career Opportunities

Completion of this certificate qualifies fire fighters, building officials, building inspectors, electrical engineers and lawyers to perform fire investigations and inspections.

Technical Studies Required		**10 Credits**
FRPT1125	Fire Investigation Basic	2
FRPT1130	Fire Inspector Basic	2
FRPT1136	Introduction to Fire Protection	2
FRPT2120	Fire Investigation Advanced	2
FRPT2125	Fire Inspector Advanced	2
Total Occupational Certificate		**10 Credits**

Occupational Certificate
Hazardous Materials
(Hopkins Tech Center)

Overview

This certificate prepares the Public Safety Responder, Police, Fire, EMS or Emergency Management to be able to handle responses to hazardous material spills. It will prepare them to be members of public hazardous materials response teams. It meets the requirements of OSHA 1910.120 and NFPA 472.

Career Opportunities

Completion of this certificate prepares public safety professionals to be members of public hazardous materials response teams.

Technical Studies Required		**15 Credits**
FRPT1175	Hazardous Materials First Responder Operational	3
FRPT1180	Hazardous Materials Technician	3
FRPT2200	Hazardous Materials Specialty Safety Officer	1
FRPT2205	Hazardous Materials Specialty Hazard Sector Officer	1
FRPT2210	Specialized Monitoring	1
FRPT2215	Hazardous Materials Specialty Containers	1
FRPT2220	Hazardous Materials Specialty Flammables - Solids, Liquids, Gases	1
FRPT2225	Hazardous Materials Specialty Corrosive and Toxic	1
FRPT2230	Hazardous Materials Specialty Poisons, Radioactives and Explosives	1
FRPT2235	Specialty Mitigation I	1
FRPT2240	Specialty Mitigation II	1
Total Occupational Certificate		**15 Credits**

Emergency Medical Services: Advances In Technology Mean Advances In Training

HTC students receive valuable training using the SimMan mannequin.

Advances in medical technology make a difference in people's lives every day, but it's not just the patients who benefit. Advances in medical technology training are making a difference in the lives of students at HTC's Hopkins Tech Center, too. That's because HTC was the first Emergency Medical Services (EMS) program in the Twin Cities metro area to introduce SimMan, a state-of-the-art mannequin that simulates many of the functions of a human body. This major advance in the mannequins used in training emergency medical workers and first responders such as firefighters and law enforcement is proving to be a major benefit to students and their future patients.

"EMS training is really different now because of the mannequin's features," said HTC EMS program director Bob McCarthy. Previously, when students worked on mannequins or people acting as victims, they had to talk to the instructors constantly to ascertain what injuries or illness they were to be treating the patient for that day. With SimMan, also known by his nickname Seymour, the technology makes it possible for the students to proceed with treatment by assessing Seymour's condition without talking to the instructor. Seymour has blood pressure, multiple heart sounds and lung sounds. The instructor can control the mannequin through a laptop computer to create emergencies such as a realistic cardiac arrest. Students can use a heart monitor on Seymour, start intravenous drugs which the mannequin reacts to, use a defibrillator, or insert tubes in Seymour's throat. Since Seymour has a microphone, when the students speak to Seymour, the instructors can have Seymour respond to the student.

"It's very different from memorizing information from a textbook or listening to classroom discussion," emphasized McCarthy. "It fosters a different atmosphere for teamwork and leadership in emergency situations." Students are videotaped in action and receive feedback from the instructors, as well as opportunities to view the tapes. This allows them to go back and rethink their actions. As McCarthy said, the SimMan can die and nobody gets hurt.

When HTC introduced SimMan a little more than a year ago, it was the first program in the Twin Cities metro to have the state-of-the-art mannequin. Now HTC has two SimMan mannequins and is one of the few programs in the state that offers this advantage to its students. At a cost of $30,000 apiece, SimMan is an investment in better training that keeps the college on the cutting edge in health care.

Training at the Hopkins Tech Center includes two certificates that are offered: Emergency Room Technician and Emergency Medical Services Specialist. Both require two semesters of study and an internship. Employment prospects are strong for both and they offer an excellent entry position for individuals interested in working in the medical field.

In addition to offering classes at the Hopkins Tech Center, the college also goes out to fire, police departments, and ambulance services to offer training. For paramedics, who are required to pass a yearly test of skills, HTC's SimMan can play an important role in reviewing and sharpening skills that are highly critical, but not used often, or as the industry describes it, "high risk, low frequency."

McCarthy noted that the medical field has been slower to use simulations in training than some other fields. Formerly, students learned in the classroom, then went to clinical settings for practical training, but didn't get the hands-on experience the SimMan offers. In contrast, said McCarthy, airline pilots have trained using simulations for many years.

Maintaining its leadership role in EMS training, HTC is currently piloting a state and national skills test for Emergency Medical Technicians, in conjunction with the Minnesota Emergency Medical Services Regulatory Board (EMSRB). The college is involved in offering first responder classes online and in the classroom, bringing "blended e-learning" to EMS training.

While nobody wants to find themselves in an emergency situation, it's good to know that HTC offers EMS training that puts the most up-to-date technology to work for the community.

Transportation
CAREERS

Auto Body Collision Technology

Associate in Applied Science Degree	Auto Body Technician (BP/EP)	72 Credits	Page 106
Diploma	Auto Body Technician (BP/EP)	64 Credits	Page 106
Advanced Technical Certificate	Structural Repair Technician Assistant (BP/EP)	16 Credits	Page 107
Occupational Certificate	Non-Structural Repair Technician Assistant (BP/EP)	16 Credits	Page 107
Occupational Certificate	Refinishing Technician Assistant (BP/EP)	17 Credits	Page 107
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Automotive Mechanics Technology

Associate in Applied Science Degree	Automotive Technician (BP/EP)	72 Credits	Page 108
Diploma	Automotive Technician (BP/EP)	64 Credits	Page 109

Ford Automotive Student Service Educational Training Program (ASSET)

Associate in Applied Science Degree	Automotive Technology (Ford ASSET) (BP)	96 Credits	Page 109

Marine/Motor Sports Technology

Diploma	Marine/Motor Sports Technician (EP)	64 Credits	Page 110
Occupational Certificate	Motorcycle Technician (EP)	30 Credits	Page 110
Occupational Certificate	Outboard Technician (EP)	30 Credits	Page 111
Occupational Certificate	Power Equipment Certificate (EP)	30 Credits	Page 111

Medium/Heavy Truck Technology

Associate in Applied Science Degree	Medium/Heavy Truck Technology (BP)	94 Credits	Page 111
Diploma	Medium/Heavy Truck Maintenance Technician (BP)	44 Credits	Page 112
Diploma	Medium/Heavy Truck Drivetrain Technician (BP)	39 Credits	Page 112

Transportation
CAREERS

Auto Body Collision Technology

Associate in Applied Science Degree
Auto Body Technician (BP/EP)

Overview
Auto Body Repair and Refinishing Technicians repair vehicles that are damaged as a result of collisions, corrosion and wear. They provide customers with cost estimates for repair, replace or repair body parts and paint vehicles using various materials, equipment and methods.

Career Opportunities
Auto Body Technicians work for automotive dealerships, independent auto shops, government agencies and other organizations that maintain their own fleets of trucks and cars. There are also opportunities to be employed as an insurance adjuster, manufacturer's representative, auto service and sales person or wholesale parts and tool sales person.

Technical Studies Required		**54 Credits**
ABCT1145	Cutting, Heating and MIG Welding	3
ABCT1150	Trim, Moveable Glass and Hardware	2
ABCT1155	Metal Straightening and Body Filler I	4
ABCT1160	Bolt-on, Weld-on Panel Replacement and Alignment	4
ABCT1165	Using Body Filler II	2
ABCT1240	Detailing	2
ABCT1255	Environmental Health, Safety and Equipment Preparation for Finishes	4
ABCT1260	Surface Preparing and Finish Application	4
ABCT1265	Tinting and Blending	4
ABCT2006	Stationary Glass Replacement	1
ABCT2015	Steering and Suspension	2
ABCT2040	Restraint Systems	1
ABCT2050	Damage Analysis and Straightening Structural Parts	3
ABCT2055	Panel Replacement and Restoring Corrosion Protection	4
ABCT2145	Electrical and Electronic Systems	1
ABCT2150	Brake Systems	1
ABCT2175	Analyzing Damage/Creating a Manual Damage Report	2
ABCT2185	Plastic Adhesive and Welding Repairs	2
ABCT2190	Air Conditioning and Cooling Systems	2
ABCT2495	Auto Body Internship I	4
MATH1000	Prealgebra	2

General Education Required		**12 Credits**
COMM2060	Small Group Communication	3
ENGL2120	Writing and Research	3
or		
ENGL2125	Technical Writing	3
PHIL2100	Critical Thinking	3
SSCI2100	Introduction to Sociology	3

General Education Elective **6 Credits**
Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Total Associate in Applied Science Degree **72 Credits**

Diploma
Auto Body Technician (BP/EP)

Overview
Auto Body Repair and Refinishing Technicians repair vehicles that are damaged as a result of collisions, corrosion and wear. They provide customers with cost estimates for repair, replace or repair body parts and paint vehicles using various materials, equipment and methods.

Career Opportunities
Auto Body Technicians work for automotive dealerships, independent auto shops, government agencies and other organizations that maintain their own fleets of trucks and cars. There are also opportunities to be employed as an insurance adjuster, manufacturer's representative, auto service and sales person or wholesale parts and tool sales person.

Technical Studies Required		**56 Credits**
ABCT1145	Cutting, Heating and MIG Welding	3
ABCT1150	Trim, Moveable Glass and Hardware	2
ABCT1155	Metal Straightening and Body Filler I	4
ABCT1160	Bolt-on, Weld-on Panel Replacement and Alignment	4
ABCT1165	Using Body Filler II	2
ABCT1240	Detailing	2
ABCT1255	Environmental Health, Safety and Equipment Preparation for Finishes	4
ABCT1260	Surface Preparing and Finish Application	4
ABCT1265	Tinting and Blending	4
ABCT2006	Stationary Glass Replacement	1
ABCT2015	Steering and Suspension	2
ABCT2040	Restraint Systems	1
ABCT2050	Damage Analysis and Straightening Structural Parts	3

ABCT2055	Panel Replacement and Restoring Corrosion Protection	4
ABCT2145	Electrical and Electronic Systems	1
ABCT2150	Brake Systems	1
ABCT2175	Analyzing Damage/Creating a Manual Damage Report	2
ABCT2185	Plastic Adhesive and Welding Repairs	2
ABCT2190	Air Conditioning and Cooling Systems	2
ABCT2495	Auto Body Internship I	4
ABCT2501	Auto Body Internship II	4

General Education Required **4 Credits**

COMM1040	Job Seeking Skills	2
or		
COMM1060	Career Portfolio	3
MATH1000	Prealgebra	2

General Education Elective **4 Credits**

Any HTC college level general education course may be used to satisfy the elective requirement.

Total Diploma **64 Credits**

Advanced Technical Certificate Structural Repair Technician Assistant (BP/EP)

Overview

Structural Assistants perform wheel alignments, replace suspension parts, prepare vehicles for structural repairs, perform minor structural repairs and replace panels.

Prerequisite: Completion of Non-Structural Repair Technician Assistant certificate or two years related experience in industry.

Career Opportunities

Auto Body Technicians work for automotive dealerships, independent auto shops, government agencies and other organizations that maintain their own fleets of trucks and cars. As a Structural Repair Technician the student will work with a Body Repair Technician who will guide the student in the repair, replacement and alignments of vehicles needing these repairs.

Technical Studies Required **11 Credits**

ABCT2006	Stationary Glass Replacement	1
ABCT2015	Steering and Suspension	2
ABCT2040	Restraint Systems	1
ABCT2050	Damage Analysis and Straightening Structural Parts	3
ABCT2055	Panel Replacement and Restoring Corrosion Protection	4

Technical Studies Elective **5 Credits**

ABCT2000	Advanced Welding Methods	1
ABCT2060	Straightening Structural Parts II	1
ABCT2495	Auto Body Internship I	4
ABCT2501	Auto Body Internship II	4
ABCT2600	Collision Lab	1-8

Total Advanced Technical Certificate **16 Credits**

Occupational Certificate Non-Structural Repair Technician Assistant (BP/EP)

Overview

This certificate prepares students to perform non-structural repairs. This includes panel repairs of four hours or less, bolt-on panel replacements and weld-on panel replacements.

Career Opportunities

Auto Body Technician Assistants work for automotive dealerships, independent auto shops, government agencies and other organizations that maintain their own fleets of trucks and cars. As a Non-structural Repair Technician Assistant the student will assist the Journeyman in repairing and replacing components in the day-to-day operations of vehicle repair.

Technical Studies Required **13 Credits**

ABCT1145	Cutting, Heating and MIG Welding	3
ABCT1150	Trim, Moveable Glass and Hardware	2
ABCT1155	Metal Straightening and Body Filler I	4
ABCT1160	Bolt-on, Weld-on Panel Replacement and Alignment	4

Technical Studies Elective **3 Credits**

ABCT1165	Using Body Filler II	2
ABCT2495	Auto Body Internship I	4
ABCT2600	Collision Lab	1-8

Total Occupational Certificate **16 Credits**

Occupational Certificate Refinishing Technician Assistant (BP/EP)

Overview

Refinishing Assistants buff cars and trucks, install detail, sand, tape, mix paint and paint small jobs and used cars.

Career Opportunities

Auto Body Technicians work for automotive dealerships, independent auto shops, government agencies and other organizations that maintain their own fleets of trucks and cars. As a Refinishing Technician's Assistant the student will work with a Journeyman Painter who will direct the student in the refinish environment. There are also opportunities to be employed as an insurance adjuster, manufacturer's representative, auto service and sales person or wholesale parts and tool sales person.

Technical Studies Required **14 Credits**

ABCT1240	Detailing	2
ABCT1255	Environmental Health, Safety and Equipment Preparation for Finishes	4
ABCT1260	Surface Preparing and Finish Application	4
ABCT1265	Tinting and Blending	4

General Education Required **1 Credit**

SSCI1000	Introduction to Environmental Health and Safety	1

Technical Studies Elective		2 Credits
ABCT1235	Finish Defects	2
ABCT1250	Auto Body Painting Internship	1-4
ABCT2600	Collision Lab	1-8
Total Occupational Certificate		**17 Credits**

Occupational Certificate Custom Fabrication and Finishing (BP/EP)

Overview

Auto Body Repair and Refinishing Technicians repair vehicles that are damaged as a result of corrosion and wear. They provide customers with cost estimates for repair, replace or repair body parts and paint vehicles using various materials, equipment and methods.

Career Opportunities

The student will have the ability to learn how to restore older model vehicles.

Technical Studies Required		19 Credits
ABCT1145	Cutting, Heating and MIG Welding	3
ABCT1155	Metal Straightening and Body Filler I	4
ABCT1255	Environmental Health, Safety and Equipment Preparation for Finishes	4
ABCT1260	Surface Preparing and Finish Application	4
ABCT1265	Tinting and Blending	4
Total Occupational Certificate		**19 Credits**

Occupational Certificate Auto Body Estimator (BP)

Overview

This certificate provides students with the skills necessary to begin a career as an estimator in the auto body industry. Students will have the opportunity to learn to properly identify damaged vehicles, necessary components and systems; demonstrate proficiency in estimating processes using both manual techniques and computer software; identify appropriate replacement parts and calculate labor costs; demonstrate effective interpersonal skills in dealing with internal and external customers in the auto body industry and successfully complete an 80 hour industry internship.

Career Opportunities

Auto Body Estimators work for automotive dealerships, independent auto body repair centers and insurance companies.

Technical Studies Required		9 Credits
ABCT1400	Collision Damage Analysis	3
ABCT1405	Estimating	2
ABCT1410	Customer Management	2
ABCT1415	Estimating Internship	2
Total Occupational Certificate		**9 Credits**

Automotive Mechanics Technology

Associate in Applied Science Degree Automotive Technician (BP/EP)

Overview

The Automotive Technology degree prepares the student in all areas of the automobile and light truck for service, diagnosis and repair at an entry-level. An Automotive Technician will diagnose, determine condition, estimate cost of repair and replace or repair various components in engines, powertrains, suspensions, brakes, electrical systems, fuel systems, emission controls and computer controlled systems.

Career Opportunities

Due to increased vehicle ownership, longer useful life of vehicles and increased maintenance requirements of new and complicated automotive systems, the demand for trained automotive technicians is at an extremely high level and is increasing annually. A wide range of employment opportunities exist in dealerships, fleets, mass merchandisers, independent garages and service stations.

The degree program also provides opportunities for advancement into shop management positions such as shop foreman, service manager and shop owner.

Technical Studies Required		53 Credits
ATEC1100	Trade Knowledge	2
ATEC1200	Clutch and Driveshaft	2
ATEC1220	Manual Transmission and Transaxle	2
ATEC1240	Differentials	1
ATEC1260	Automatic Transmission	3
ATEC1265	Automatic Transaxles	2
ATEC1300	Brakes	2
ATEC1320	Steering and Suspension	2
ATEC1340	Alignment and Balance	2
ATEC1400	Upper Engine	2
ATEC1440	Lower Engine	2
ATEC1500	Basic Electricity	3
ATEC1530	Chassis Electrical	3
ATEC1550	Starting and Charging Systems	2
ATEC1580	Air Conditioning and Heating	2
ATEC1600	Fuel Systems and Turbochargers	2
ATEC1610	Ignition Systems	3
ATEC1630	Emission Controls	2
ATEC1650	GM Computer System	3
ATEC1670	Ford Computer System	2
ATEC1675	Chrysler Computer System	2
ATEC2685	Automotive Industry Internship I	5
MATH1000	Prealgebra	2
General Education Required		**18 Credits**
COMM2050	Interpersonal Communication	3
CPLT1100	Introduction to Personal Computers	3

ENGL2120	Writing and Research	3
or		
ENGL2125	Technical Writing	3
PHIL2100	Critical Thinking	3
PHIL2200	Ethics	3
SSCI2100	Introduction to Sociology	3
Technical Studies Elective		**1 Credit**
ATEC2690	Automotive Industry Internship II	5
Total Associate in Applied Science Degree		**72 Credits**

Diploma
Automotive Technician (BP/EP)

Overview
The Automotive Mechanics Technician diploma prepares the student in all areas of the automobile and light truck for service, diagnosis and repair at an entry-level. An automotive technician will diagnose, determine condition, estimate cost of repair and replace or repair various components in engines, powertrains, suspensions, brakes, electrical systems, fuel systems, emission controls and computer controlled systems.

Career Opportunities
Due to increased vehicle ownership, longer useful life of vehicles and increased maintenance requirements of new and complicated automotive systems, the demand for trained automotive technicians is at an extremely high level and is increasing annually. A wide range of employment opportunities exist in dealerships, fleets, mass merchandisers, independent garages and service stations.

Technical Studies Required		**56 Credits**
ATEC1100	Trade Knowledge	2
ATEC1200	Clutch and Driveshaft	2
ATEC1220	Manual Transmission and Transaxle	2
ATEC1240	Differentials	1
ATEC1260	Automatic Transmission	3
ATEC1265	Automatic Transaxles	2
ATEC1300	Brakes	2
ATEC1320	Steering and Suspension	2
ATEC1340	Alignment and Balance	2
ATEC1400	Upper Engine	2
ATEC1440	Lower Engine	2
ATEC1500	Basic Electricity	3
ATEC1530	Chassis Electrical	3
ATEC1550	Starting and Charging Systems	2
ATEC1580	Air Conditioning and Heating	2
ATEC1600	Fuel Systems and Turbochargers	2
ATEC1610	Ignition Systems	3
ATEC1630	Emission Controls	2
ATEC1650	GM Computer System	3
ATEC1670	Ford Computer System	2
ATEC1675	Chrysler Computer System	2
ATEC2685	Automotive Industry Internship I	5
ATEC2690	Automotive Industry Internship II	5
General Education Required		**5 Credits**
COMM1040	Job Seeking Skills	2
MATH1000	Prealgebra	2
SSCI1000	Introduction to Environmental Health and Safety	1
General Education Elective		**3 Credits**

Any HTC college level general education course may be used to satisfy the elective requirement.

Total Diploma **64 Credits**

Ford Automotive Student Service Educational Training Program (ASSET)

Associate in Applied Science Degree
Automotive Technology (Ford ASSET) (BP)

Overview
The Ford Automotive Student Service Educational Training (ASSET) program is a factory authorized training program that is jointly sponsored by Ford Motor Company, Ford and Lincoln-Mercury Dealers, and Hennepin Technical College. It is designed to train automotive technicians to repair all the newer model Ford Motor Company vehicles. Students can only enter this program by special application and by the sponsorship of a Ford or Lincoln-Mercury dealership.

Career Opportunities
All students who successfully complete this program will be Ford certified in all STST speciality areas. They will be employed by Ford and/or Lincoln-Mercury dealers as dealership repair technicians. A large number of jobs exist for qualified automotive technicians in the metropolitan and rural communities. The potential to advance to service writer, service manager, sales positions, company representatives or other dealership management is excellent.

Technical Studies Required		**78 Credits**
FDAS1200	Ford Electrical Systems	3
FDAS1250	Ford Gasoline Engine Performance I	2
FDAS1260	Ford Gasoline Engine Performance II	3
FDAS1300	Related Mechanical Skills	1
FDAS1400	Clutches/Differentials	2
FDAS1410	Manual Transmission/Transaxle	2
FDAS1500	Basic Engines	3
FDAS1550	Engine Repair	2
FDAS1600	Ford Suspension Systems	2
FDAS1610	Noise Vibration Harshness	2
FDAS1650	Ford Steering	2
FDAS1701	Ford Climate Control	3
FDAS1750	Ford Fuel Systems	2
FDAS1810	Ford Dealership Internship I	6
FDAS1820	Ford Dealership Internship II	6

FDAS2030	Ford Dealership Internship III	6
FDAS2040	Ford Dealership Internship IV	6
FDAS2052	Ford Dealership Internship V	9
FDAS2230	Ford Car Transmissions	3
FDAS2240	Ford Truck Transmissions	3
FDAS2501	Ford Advanced Engine Performance	2
FDAS2551	Ford DI Diesel	3
FDAS2600	Ford Braking Systems	3
MATH1000	Prealgebra	2
General Education Required		**18 Credits**
COMM2050	Interpersonal Communication	3
CPLT1100	Introduction to Personal Computers	3
ENGL2125	Technical Writing	3
PHIL2100	Critical Thinking	3
PHIL2200	Ethics	3
SSCI2100	Introduction to Sociology	3
Total Associate in Applied Science Degree		**96 Credits**

Marine/Motor Sports Technology

Diploma
Marine/Motor Sports Technician (EP)

Overview

Marine/Motor Sports Technicians service, diagnose and repair motorcycles, snowmobiles, outboards, stern drive boats and lawn and garden equipment.

Career Opportunities

Marine/Motor Sports Technicians find employment at marine, motorcycle or snowmobile dealerships, distributors and manufacturers. Technicians are also in demand at service repair shops and businesses that service and repair motorcycles, outboard and inboard boat motors and lawn and garden equipment.

Technical Studies Required		**45 Credits**
MMST1100	Introduction to Marine and Motor Sport Technology	3
MMST1105	Introduction to Engine Theory	3
MMST1110	Introduction to Fuel Systems	3
MMST1115	Introduction to Electrical Systems	3
MMST1120	Introduction to Ignition Systems	3
MMST1125	Service Management	3
MMST1130	Introduction to Drive Systems	3
MMST1135	Tune Up and Storage	3
MMST1140	Engine Overhaul	3
MMST2100	Motorcycle Tune Up	3
MMST2120	Motorcycle Fuel System Service	3
MMST2125	Marine Lower Units	3
MMST2130	Marine Cooling Systems	3
MMST2160	Power Equipment Fuel Systems	3
MMST2180	Power Equipment Accessory Maintenance	3
General Education Required		**7 Credits**
COMM1040	Job Seeking Skills	2
MATH1000	Prealgebra	2
METS1000	Computers in Manufacturing	3
General Education Elective		**1 Credit**

Any HTC college level general education course may be used to satisfy the elective requirement.

Recommended:

SSCI1020	CPR/First Aid	1
Technical Studies Elective		**11 Credits**
MMST2185	Snowmobile Tune Up	3
MMST2190	Snowmobile Drive System/Chassis Service	3
MMST2195	Snowmobile Engine Overhaul	3
MMST2200	I/O Tune Up	3
MMST2205	I/O Transom Service	3
MMST2210	I/O Engine Overhaul	3
MMST2215	PWC Engine Service	3
MMST2220	PWC Electrical/Ignition Service	3
MMST2225	PWC Water Pump Service	3
MMST2230	Test Run	3
Total Diploma		**64 Credits**

Occupational Certificate
Motorcycle Technician (EP)

Overview

Motorcycle Technicians service, diagnose and repair motorcycles.

Career Opportunities

Motorcycle Technicians find employment at motorcycle dealerships, distributors and manufacturers. Technicians are also in demand at service repair shops and businesses.

Technical Studies Required		**30 Credits**
MMST1100	Introduction to Marine and Motor Sport Technology	3
MMST1105	Introduction to Engine Theory	3
MMST1110	Introduction to Fuel Systems	3
MMST1115	Introduction to Electrical Systems	3
MMST1120	Introduction to Ignition Systems	3
MMST2100	Motorcycle Tune-Up	3
MMST2105	Motorcycle Transmissions and Clutch Service	3
MMST2110	Motorcycle Wheels and Suspension	3
MMST2115	Motorcycle Overhaul	3
MMST2120	Motorcycle Fuel System Service	3
Total Occupational Certificate		**30 Credits**

Occupational Certificate
Outboard Technician (EP)

Overview
Outboard Marine Technicians service, diagnose and repair outboard motors.

Career Opportunities
Outboard Marine Technicians find employment at marine dealerships, distributors and manufacturers. Technicians are also in demand at service repair shops and businesses.

Technical Studies Required		**30 Credits**
MMST1100	Introduction to Marine and Motor Sport Technology	3
MMST1105	Introduction to Engine Theory	3
MMST1110	Introduction to Fuel Systems	3
MMST1115	Introduction to Electrical Systems	3
MMST1120	Introduction to Ignition Systems	3
MMST2125	Marine Lower Units	3
MMST2130	Marine Cooling Systems	3
MMST2135	Marine Electrical Systems	3
MMST2140	Marine Tilt Trim and Controls	3
MMST2145	Marine Overhaul	3
Total Occupational Certificate		**30 Credits**

Occupational Certificate
Power Equipment Certificate (EP)

Overview
Power Equipment student will perform repairs on a variety of lawn and garden equipment. Lawn and garden equipment will include lawn mowers, snow blowers and most hand held chore performing devices.

Career Opportunities
Employment for the power equipment graduate will have a wide range of opportunities including lawn and garden shops, rental shops, golf course maintenance facilities, farm equipment dealerships, and many other small engine repair shops.

Technical Studies Required		**30 Credits**
MMST1100	Introduction to Marine and Motor Sport Technology	3
MMST1105	Introduction to Engine Theory	3
MMST1110	Introduction to Fuel Systems	3
MMST1115	Introduction to Electrical Systems	3
MMST1120	Introduction to Ignition Systems	3
MMST2155	Power Equipment Electrical/Ignition Systems	3
MMST2160	Power Equipment Fuel Systems	3
MMST2165	Chore Performers	3
MMST2170	Power Equipment Overhaul	3
MMST2175	Power Equipment Drive Systems	3
or		
MMST2180	Power Equipment Accessory Maintenance	3
Total Occupational Certificate		**30 Credits**

Medium/Heavy Truck Technology

Associate in Applied Science Degree
Medium/Heavy Truck Technology (BP)

Overview
Students in the Medium/Heavy Truck Technology A.A.S. degree program are sponsored by a trucking company. Students split their learning between taking courses at the college and developing skills through paid internships at truck repair companies. Students spend the first-half of each semester taking courses at the college and the second-half of each semester on a paid internship developing the skills just learned in class. This schedule is repeated throughout the two-year program. The college assists students in obtaining a trucking industry sponsor for the internship portion of the program.

This program is designed to provide individuals with the knowledge and skills needed to be an entry-level technician in the trucking industry. Students will practice their skills in a well equipped lab and develop production level skills at their industry sponsored company. Some of the areas of study are electrical and electronic systems, steering and suspension, air and hydraulic ABS brake systems and vehicle maintenance. Students will perform diesel engine troubleshooting, overhaul procedures, and tune-ups on both mechanical and electronic engines. Clutch, transmission, and drive axle diagnosis, repair and overhaul will be taught along with preventive maintenance procedures. Instruction will include classroom theory, shop demonstrations, and hands on skill development. Much of the lab work is performed on actual vehicles or engines in operating condition.

Career Opportunities
Career opportunities as a skilled truck technician are available in truck dealerships, leasing companies, trucking fleets, and independent truck repair shops. Students may choose other options such as railroads, heavy equipment, mass transit companies, or marine applications. Electronic diesel engines, transmissions, and ABS brake systems have revolutionized the trucking industry creating a great demand for the skilled truck technician.

Technical Studies Required		**76 Credits**
MHTT1001	Truck Technology Fundamentals	3
MHTT1010	Electricity in Truck Technology I	3
MHTT1015	Electricity in Truck Technology II	3
MHTT1020	Vehicle Service	3
MHTT1030	Internship/Industry Partnership I	5
MHTT1100	Hydraulic Brake Systems	3
MHTT1115	Air Brake Systems and Controls	3
MHTT1130	Internship/Industry Partnership II	5
MHTT1200	Steering and Suspension Systems	3

MHTT1210	Clutch and Driveline	3
MHTT1300	Intro to Diesel Engines	3
MHTT1321	Heating and Air Conditioning	3
MHTT1330	Internship/Industry Partnership III	5
MHTT1401	Diesel Engine II	3
MHTT1410	Manual Transmissions	3
MHTT1420	Drive Axles	3
MHTT1430	Internship/Industry Partnership IV	5
MHTT1501	Diesel Engine III	3
MHTT1511	Diesel Engine IV	3
MHTT1532	Internship/Industry Partnership V	9
MATH1000	Prealgebra	2

General Education Required **18 Credits**

COMM2050	Interpersonal Communication	3
CPLT1100	Introduction to Personal Computers	3
ENGL2125	Technical Writing	3
PHIL2100	Critical Thinking	3
PHIL2200	Ethics	3
SSCI2100	Introduction to Sociology	3

Total Associate in Applied Science Degree **94 Credits**

Diploma
Medium/Heavy Truck Maintenance Technician (BP)

Overview

Students in this Medium/Heavy Truck Maintenance Technician program will split their learning between the college and industry at a paid internship site. This is a one-year, three-semester course of instruction including: classroom theory, shop demonstrations, and hands on skill development. Some of the areas of study are: truck preventive maintenance, electrical systems, air and hydraulic ABS brake systems, heating and air conditioning systems, diesel engine systems, and steering and suspension systems. Much of the shop work is performed on actual vehicles and engines in operating condition.

Career Opportunities

Career opportunities as a skilled maintenance technician are available in truck dealerships, leasing companies, trucking fleets, and independent truck repair shops.

Technical Studies Required **37 Credits**

MHTT1001	Truck Technology Fundamentals	3
MHTT1010	Electricity in Truck Technology I	3
MHTT1015	Electricity in Truck Technology II	3
MHTT1020	Vehicle Service	3
MHTT1030	Internship/Industry Partnership I	5
MHTT1100	Hydraulic Brake Systems	3
MHTT1115	Air Brake Systems and Controls	3
MHTT1130	Internship/Industry Partnership II	5
MHTT1200	Steering and Suspension Systems	3
MHTT1300	Intro to Diesel Engines	3
MHTT1321	Heating and Air Conditioning	3

General Education Required **7 Credits**

MATH1000	Prealgebra	2
COMM1050	Communication in the Workplace	2
CPLT1100	Introduction to Personal Computers	3

Total Diploma **44 Credits**

Diploma
Medium/Heavy Truck Drivetrain Technician (BP)

Overview

Students in this Medium/Heavy Truck Drivetrain Technician program will split their learning between the college and industry at a paid internship site. This is a one-year, three-semester course of instruction including: classroom theory, shop demonstrations, and hands on skill development. Some of the areas of study are: clutch and driveline, manual transmissions, drive axles, mechanical and electronically controlled diesel engines. Diagnosis, repair, and overhaul procedures will be performed on actual vehicles and engines in operating condition.

Prerequisite: Graduation from the Medium/Heavy Truck Maintenance Technician program or two years of truck mechanic experience.

Career Opportunities

Career opportunities as a skilled maintenance technician are available in truck dealerships, leasing companies, truck fleets, and independent truck repair shops. Electronic diesel engines, transmissions, and ABS brake systems have revolutionized the trucking industry creating a great demand for the skilled truck technician.

Technical Studies Required **37 Credits**

MHTT1210	Clutch and Driveline	3
MHTT1330	Internship/Industry Partnership III	5
MHTT1401	Diesel Engine II	3
MHTT1410	Manual Transmissions	3
MHTT1420	Drive Axles	3
MHTT1430	Internship/Industry Partnership IV	5
MHTT1501	Diesel Engine III	3
MHTT1511	Diesel Engine IV	3
MHTT1532	Internship/Industry Partnership V	9

General Education Elective **2 Credits**

Any HTC college level general education course may be used to satisfy the elective requirement.

Total Diploma **39 Credits**

Course Descriptions

Course descriptions are listed in alphabetical order by course number. All general studies and developmental courses are shaded.

The letters in parentheses following the course descriptions indicate the location(s) where the courses are offered. Courses may be offered at other locations throughout the metro area.

BP (Brooklyn Park Campus),
EP (Eden Prairie Campus), and
Hopkins Tech Center

Hennepin Technical College's 2000-level general education courses, with one area of exception, meet the guidelines of the Minnesota Transfer Curriculum (MnTC). The excepted area contains courses in computer literacy. Although students may apply up to three computer literacy credits toward satisfying the general education requirements for an A.A.S. degree, the computer literacy credits do not meet the MnTC guidelines and may or may not be accepted for general education transfer by other Minnesota colleges.

Course Descriptions

ABCT1000 INTRODUCTION TO AUTO BODY TECHNOLOGY I (NON-STRUCTURAL)

Technicians performing non-structural repairs will need to know the basic fundamentals of the following procedures: safe operation of Oxy/Acy welding equipment, sheet metal straightening techniques, application and finishing of plastic fillers, removal and replacement of bolt on components and plastic component identification and repairs. (Prereq: None) **(BP/EP) 1 cr**

ABCT1005 INTRODUCTION TO AUTO BODY TECHNOLOGY II (REFINISHING)

A Refinishing Technician must be competent in the following areas: cleaning and sanding of vehicle components, masking materials and procedures, application of undercoats and topcoats, sanding and buffing of colorcoat and understanding the use and operation of refinishing equipment. (Prereq: None) **(BP/EP) 1 cr**

ABCT1010 INTRODUCTION TO AUTO BODY TECHNOLOGY III (STRUCTURAL)

To return the vehicle to pre-accident condition, the Structural Technician must know the following: removal and replacement of weld-on components, diagnosing damage and understanding frame specification, understanding anchoring and pulling techniques, restoring the vehicle's structural integrity requiring the use of the wirefeed welder and restoring the drivability of the vehicle which means the technician must understand the 4-wheel alignment theory. (Prereq: None) **(BP/EP) 1 cr**

ABCT1015 INTRODUCTION TO AUTO BODY TECHNOLOGY IV (RELATED)

Office and related procedures are an important part of running an auto body business. It is necessary for the owner/manager/foreman to be able to: interpret vehicle identification and color codes, examine damaged vehicles and prepare written estimates, remove glass and know replacement procedures, prepare vehicle for customer delivery and have the ability to interact with customers and insurance representatives. (Prereq: None) **(BP/EP) 1 cr**

ABCT1145 CUTTING, HEATING AND MIG WELDING

The use of oxy-acetylene welding, brazing and the type of metal being used dictates cutting on automotive sheet metal. Technicians must be familiar with how the oxy-acetylene process may be used during collision repair. Modern vehicle designs have very exacting requirements regarding the metal joining process used in their construction and repair. Technicians must be familiar with the various metal joining processes and how they apply to auto collision repair. (Prereq: None) **(BP/EP) 3 cr**

ABCT1150 TRIM, MOVEABLE GLASS AND HARDWARE

Many repairs made to vehicle doors and other glass installations require the removal and installation of glass. Proper removal and installation is necessary to prevent damage to the glass or vehicle. Improper removal and installation can also cause wind noise and water leaks. Selection of proper tools, safe use of tools and proper removal procedures will be emphasized in this course. Installation procedures will be covered. (Prereq: None) **(BP/EP) 2 cr**

ABCT1155 METAL STRAIGHTENING AND BODY FILLER I

Straightening damaged metal panels back to original contours reduces the need for excessive amounts of body filler. Minimizing the amount of filler applied to a panel provides the customer with a high-quality repair. Improper application of plastic body filler can lead to poor quality repairs. It is important to understand the purpose of plastic fillers and to learn to use them for their intended purpose. (Prereq: None) **(BP/EP) 4 cr**

ABCT1160 BOLT-ON, WELD-ON PANEL REPLACEMENT AND ALIGNMENT

Proper use and selection of tools is very important to properly remove, install and align bolt-on-panels. Properly removing, installing and aligning bolt-on-parts is essential to restoring the vehicle to pre-accident condition. Proper tools and equipment along with proper techniques are essential for the removal and replacement of weld-on-panels. The fit and finish of the final repair is determined by proper panel installation. Alignment to adjacent panels, gaps at door and decklid, panel warpage and damage to adjacent panels are major factors in the quality of the finished product. (Prereq: None) **(BP/EP) 4 cr**

ABCT1165 USING BODY FILLER II

Proper finish of plastic body filler in a quick, efficient manner is necessary to minimize labor costs and maximize earnings. (Prereq: None) **(BP/EP) 2 cr**

ABCT1235 FINISH DEFECTS

Today's vehicles have finishes that are very refined and free from noticeable defects. To maintain and restore these features in a finish, the technician will learn to identify types of finish defects and the proper correction procedures using the least aggressive methods. (Prereq: None) **(BP/EP) 2 cr**

ABCT1240 DETAILING

This course is designed to teach the technician specific skills needed to enter the field of reconditioning on new and used cars. It includes buffing and polishing the exteriors, cleaning and detailing the interior, cleaning and painting the engine compartment and installing body accent stripes and moldings. (Prereq: None) **(BP/EP) 2 cr**

ABCT1250 AUTO BODY PAINTING INTERNSHIP
Following internship guidelines and guidelines in all previous successfully completed courses, the technician will work in a designated auto body repair facility with a journeyman and paint vehicles to manufacturers specifications. (Prereq: None) **(BP/EP) 1-4 cr**

ABCT1255 ENVIRONMENTAL HEALTH, SAFETY AND EQUIPMENT PREPARATION FOR FINISHES
All technicians must understand health and safety information and practices. Concern for the environment and governmental regulations must be followed or environmental damage could result and possible fines could apply. Knowledge of paint systems and materials provides the technician with the information necessary to make the right decisions when refinishing a vehicle. The technician will develop a plan for refinishing a vehicle using a single system. The correct operation of the equipment and the paint environment are critical for the completion of a satisfactory refinish job. Automotive finishes are marvels of chemical technology and precise information will allow the technician to understand automotive refinish materials. (Prereq: None) **(BP/EP) 4 cr**

ABCT1260 SURFACE PREPARING AND FINISH APPLICATION
This course will enable the technician to identify type and color of a finish, understand undercoat materials, understand sanding procedures and masking procedures in the preparation of the surface for refinishing. Manufacturers of today's vehicles use various refinish systems such as single stage, base coat, clearcoat and tri-stage. To properly refinish a vehicle and meet customer expectations, the technician will understand and apply these types of finishes. (Prereq: None) **(BP/EP) 4 cr**

ABCT1265 TINTING AND BLENDING
The technician will understand how to achieve a blendable match with all colors by using a systematic approach to evaluate color match and make correct tinting decisions. Paint finishes on today's vehicles need to be free of defects. Many defects happen as a result of spraying and application procedures. Technicians must be familiar with paint problems and be able to prevent them during refinishing operations. (Prereq: None) **(BP/EP) 4 cr**

ABCT1300 AUTO BODY STRUCTURAL REPAIR INTERNSHIP I
Following internship guidelines and guidelines in all previous successfully completed courses, the technician will work in a designated auto body repair facility with a journeyman and repair vehicles to manufacturers specifications in non-structural repairs. (Prereq: None) **(BP/EP) 4 cr**

ABCT1305 AUTO BODY STRUCTURAL REPAIR INTERNSHIP II
The technician will work in a designated auto body repair facility with a journeyman and repair vehicles to manufacturers specifications. (Prereq: None) **(BP/EP) 4 cr**

ABCT1400 COLLISION DAMAGE ANALYSIS
Students will have the to opportunity to learn about various vehicle designs, manufacturing processes, energy management processes, repair issues, and measuring for repair processes. Students will be able to recognize damage to various mechanical components, interior components, and exterior components. Repair processes to manufactures guidelines of finish, fit-up and proper corrosion protection will also be covered. (Prereq: None) **(BP) 3 cr**

ABCT1405 ESTIMATING
The student will be introduced to estimating procedures which include identifying vehicle components, selecting appropriate replacement parts, labor costs, utilizing manual estimating systems and computerized estimating systems. The students will create damage reports from this information including calculating parts, labor, supplies and materials for accurate repair costs. (Prereq: None) **(BP) 2 cr**

ABCT1410 CUSTOMER MANAGEMENT
Students learn appropriate industry terminology, measuring and improving levels of customer service, interpreting body language, conflict resolution, telephone and in-person communication skills, personal conduct and business ethics, and the completion of paperwork related to auto body customer management functions. (Prereq: None) **(BP) 2 cr**

ABCT1415 ESTIMATING INTERNSHIP
The apprentice estimator will work in a designated auto body repair facility along side an experience estimator following internship guidelines and guidelines in all previously completed courses. Students participate in writing estimates and facilitating repair processes. Students will also understand customer needs, repair costs, insurance company requirements, customer delivery and follow up of all repairs. (Prereq: ABCT1400, ABCT1405 and ABCT1410) **(BP) 2 cr**

ABCT2000 ADVANCED WELDING METHODS
Modern vehicle designs have very exacting requirements regarding metal joining processes used in their construction and repair. Technicians will be familiar with these processes and will use advanced methods in the duplication of collision repairs. (Prereq: ABCT1145) **(BP/EP) 1 cr**

ABCT2006 STATIONARY GLASS REPLACEMENT
Selecting the proper glass, proper use of specialty tools and proper installation procedures are included in this course. Checking for wind noise, water leaks and glass repair systems will be addressed. (Prereq: ABCT1150) **(BP/EP) 1 cr**

ABCT2015 STEERING AND SUSPENSION
Driving performance problems after collision repairs can result in customer complaints. Accurate diagnosis and repair of wheel and tire conditions can lead to customer satisfaction. (Prereq: None) **(BP/EP) 2 cr**

ABCT2040 RESTRAINT SYSTEMS
This course will teach theory and practical applications of automotive restraint systems along with diagnosis and service. (Prereq: None) **(BP/EP) 1 cr**

ABCT2050 DAMAGE ANALYSIS AND STRAIGHTENING STRUCTURAL PARTS
If a damaged vehicle is not properly inspected, hidden areas of damage may be overlooked. Damage not repaired could result in premature wear or failure of structural, mechanical or safety related systems. Pulling and anchoring systems come in a variety of types and styles from many different manufacturers. Collision Repair Technicians must be familiar with these anchoring and pulling systems and their operation. (Prereq: None) **(BP/EP) 3 cr**

ABCT2055 PANEL REPLACEMENT AND RESTORING CORROSION PROTECTION
The technician will understand how the modern vehicle is manufactured has changed dramatically as have the methods by which they are repaired. Failure to restore pre-accident crushability in a damaged vehicle may affect future air bag deployment. As a result, repair methods and proper procedures for full or partial panel replacement have been developed. It is important that the technician understands and stays current on these methods for repairing damaged vehicles. Aligning and welding a new replacement panel is an important step in the repair of a vehicle. Improperly positioning panels will affect both the appearance and the drivability of the repaired vehicle. This course will also teach corrosion protection principles and methods for replacing protection on all interior and exterior surfaces. (Prereq: ABCT1160, ABCT2000 and ABCT2006) **(BP/EP) 4 cr**

ABCT2060 STRAIGHTENING STRUCTURAL PARTS II
When applying corrective forces, a technician must understand what property changes take place in the metal. When metal is bent its grain structure is changed and when grain structure is changed, the metal is stressed and may be weakened. (Prereq: ABCT2050) **(BP/EP) 1 cr**

ABCT2110 CREATING A COMPUTERIZED DAMAGE REPORT
There are many computer systems available today on a wide range of different computers. Like manual estimates, computer estimates are still written by a person and must also follow the rules of the system being used. Understanding the computer is important to check its accuracy and completeness for the repairs. (Prereq: None) **(BP/EP) 1 cr**

ABCT2115 PLASTIC IDENTIFICATION AND REPAIR DECISION
With the increased use of plastics by vehicle manufacturers, technicians and appraisers are making decisions on whether to repair or replace damaged parts. With an understanding of the unique issues involved in deciding to repair or replace a plastic part, the technician will now be able to make the best decision. (Prereq: None) **(BP/EP) 1 cr**

ABCT2130 PADDED DASH REPAIRS
Following a collision, foam filled dash pads or padded instrument panels may be dented or torn. The technician will understand the procedures to repair this damage to restore the vehicle to pre-accident condition. (Prereq: None) **(BP/EP) 1 cr**

ABCT2140 REFINISHING OF PLASTICS
Vehicle plastics must be refinished following repairs. Often a specific plastic may require special preparation of primers to get the paints to bond. The technician must be familiar with various refinishing procedures to refinish automotive plastics. (Prereq: None) **(BP/EP) 1 cr**

ABCT2145 ELECTRICAL AND ELECTRONIC SYSTEMS
Following a collision, electrical and electronic problems need to be correctly diagnosed and repaired. The technician will understand these systems needed to restore vehicles to pre-accident condition. (Prereq: None) **(BP/EP) 1 cr**

ABCT2150 BRAKE SYSTEMS
This course is designed to apply knowledge of brake system operation and performance problems. (Prereq: None) **(BP/EP) 1 cr**

ABCT2165 DRIVETRAINS
Theory and practical application of drivetrain components and their assemblies will be covered in this course. (Prereq: None) **(BP/EP) 1 cr**

ABCT2170 FUEL INTAKE AND EXHAUST SYSTEMS
This course is designed to apply knowledge of auto fuel intake and exhaust systems theory and service level of protection. (Prereq: None) **(BP/EP) 1 cr**

ABCT2175 ANALYZING DAMAGE/CREATING A MANUAL DAMAGE REPORT
Accurate damage reports and cost estimating depends on proper use of collision estimating model guides. The collision guide is used to write an damage report for calculating parts, labor, supplies and materials for an accurate repair cost. The student then creates a manual damage report from this information. The damage report is the first guide to use during the beginning of the repair sequence and it provides a written plan for these repairs. (Prereq: None) **(BP/EP) 2 cr**

ABCT2185 PLASTIC ADHESIVE AND WELDING REPAIRS
The technician must be able to determine when and how to perform the two-part adhesive repair procedures to various interior and exterior automotive plastic panels. In recent years plastics are being used on a more frequent basis in automobile manufacturing. One of the most common materials used is Sheet Molded Compounds (SMC). It is important for the technician to understand the composition of both materials and how to repair plastic panels. Applying knowledge of plastic welding to repair damaged automotive plastics is an important skill. Technicians must understand when plastic welding can be used and how to select the correct welding technique and materials to make a successful repair. (Prereq: None) **(BP/EP) 2 cr**

ABCT2190 AIR CONDITIONING AND COOLING SYSTEMS
This course is designed to apply knowledge of auto cooling system theory and service level of protection. All technicians must understand and apply knowledge of air conditioning theory and recover of refrigerant. (Prereq: None)
(BP/EP) 2 cr

ABCT2495 AUTO BODY INTERNSHIP I
Following internship guidelines and guidelines in all previous successfully completed courses, the technician will work in a designated auto body repair facility with a journeyman and repair vehicles to manufacturers specifications. (Prereq: None)
(BP/EP) 4 cr

ABCT2501 AUTO BODY INTERNSHIP II
Following internship guidelines and guidelines in all previous successfully completed courses, the technician will work in a designated auto body repair facility with a journeyman and repair vehicles to manufacturers specifications. (Prereq: None)
(BP/EP) 4 cr

ABCT2600 COLLISION LAB
Following collision lab guidelines, the technician will apply knowledge learned in previous successfully completed courses and perform repairs as specified by manufacturers specifications. (Prereq: None) **(BP/EP) 1-8 cr**

ACCT1000 BOOKKEEPING
This course is designed to provide an introduction to basic accounting procedures including analyzing business transactions, recording transactions in a variety of journals, preparing financial statements and completing the accounting cycle. (Prereq: None) **(BP/EP) 3 cr**

ACCT1100 PRINCIPLES OF ACCOUNTING I
This course is an introduction to the fundamental concepts and principles which are used in a business environment to analyze and record transactions using the accrual method of accounting. This course also covers analyzing and recording transactions for cash, marketable securities, accounts receivable, payroll, current and contingent liabilities, inventories and plant assets. (Prereq: None) **(BP/EP) 4 cr**

ACCT1105 PRINCIPLES OF ACCOUNTING II
This course is a presentation of accounting for intangible assets, long-term liabilities, stockholders' equity and retrained earnings. It includes financial statement analysis, the cash flow statement and provides an introduction to cost and managerial accounting. (Prereq: ACCT1100) **(BP/EP) 4 cr**

ACCT1111 PAYROLL ACCOUNTING
This course provides a background in federal wage laws, wage and salary calculations, federal and state payroll tax calculations, federal and state federal reporting requirements and accounting for the payroll process. It includes a payroll preparation and quarterly and annual reporting practice set. (Prereq: ACCT1000 or ACCT1100 or concurrent)
(BP/EP) 3 cr

ACCT1116 TEN-KEY CALCULATOR FOR ACCOUNTING
This course is designed for the student to learn the ten-key touch method for calculators. The student learns to use the calculator in math and accounting applications.
(Prereq: None) **(BP/EP) 2 cr**

ACCT1125 EXCEL
This course is designed to give the student knowledge of the use of spreadsheet in business. The student will learn basic data manipulation and printing including formulas, what-if analysis, charts, sorts, and extraction. (Advanced Excel is listed under Computer Careers.) (Prereq: None)
(BP/EP) 3 cr

ACCT1130 PEACHTREE ACCOUNTING SOFTWARE
This course is an introduction to the use of computers in the accounting functions of a business. Students will practice fundamental accounting activities using Peachtree Complete III software. The training includes general ledger, accounts receivable, accounts payable, inventory, payroll, fixed assets and financial statement analysis. (Prereq: ACCT1100)
(BP/EP) 3 cr

ACCT1135 QUICKBOOKS
This course is focused on using computers in the accounting functions of a small business. Students will become familiar with using QuickBooks software to record a variety of business accounting transactions. Training exercises will let students practice the entries for recording of sales, purchases, receivables, payables and other common events.
(Prereq: ACCT1100) **(BP/EP) 3 cr**

ACCT1140 BUSINESS LAW
This course is an introduction to the principles of law as they apply to businesses. Topics covered include the court system, contracts, purchases and sales under the UCC, commercial paper, employment law and business organizations and regulation. (Prereq: None) **(BP/EP) 3 cr**

ACCT2200 INTERMEDIATE ACCOUNTING I
This course is an overview of financial accounting and its theoretical foundation including a conceptual framework of accounting for financial statements. It includes an in-depth study of specific assets and present and future value concepts. (Prereq: ACCT1105) **(BP/EP) 4 cr**

ACCT2205 INTERMEDIATE ACCOUNTING II
This course is a continuation in the comprehensive study of financial accounting theories and concepts. Topics include accounting for liabilities, stockholders' equity, income taxes, disclosures, cash flow and financial statement analysis.
(Prereq: ACCT2200) **(BP/EP) 4 cr**

Course Descriptions

ACCT2210 COST ACCOUNTING
This course is an introduction to the principles and concepts used to account for direct materials and labor and factory overhead in a manufacturing entity. It includes using the cost accounting data as a management tool for planning and controlling costs associated with the manufacturing process. (Prereq: ACCT1105) **(BP/EP) 4 cr**

ACCT2220 MANAGERIAL ACCOUNTING
This course is a presentation of how accounting data and concepts may be interpreted and applied by management in planning and controlling business operations. (Prereq: ACCT2210) **(BP/EP) 3 cr**

ACCT2231 INCOME TAX
This course is an explanation and interpretation of the Internal Revenue Code to assist taxpayers in the preparation and filing of individual, business, and corporate tax returns. (Prereq: ACCT1105) **(BP/EP) 4 cr**

ACCT2800 ACCOUNTING INTERNSHIP
This is a cooperative internship program between Hennepin Technical College and an employer to allow the student work experience in the accounting area. (Prereq: Instructor approval) **(BP/EP) 1-10 cr**

APKG1125 POWER TRANSMISSION AND MECHANICAL SYSTEMS
This course is an introduction to Automated Machinery Systems/Packaging. It is designed for persons who will be or are employed as machine assemblers, maintenance mechanics, field service personnel, engineers and manufacturing technicians. Covered in the course are the basic components of automated machinery systems. They include chains, belts, couplings, gear reducers, shaft alignment, gear trains, linkages, bearings, brakes, clutches and machine timing. Included are hands-on projects in addition to demonstration and lecture on actual packaging machines. (Prereq: None) **(EP) 4 cr**

APKG1130 MAINTENANCE OPERATIONS
In this course the student will practice using the drill press, hand saw, pedestal grinder and sandblasters to build parts from a blueprint. This course also includes the basics of machinery maintenance, lubrication and the use of the machinists handbook plus equipment manufacturers catalogs to specify machine components. (Prereq: None) **(EP) 2 cr**

APKG1155 AUTOMATION CONTROLS
This course is designed for persons in the field of automation. Students study the principles of automation including relay control circuits, utilizing electro-mechanical devices and electrical controlled systems. Students will learn to read and use ladder line control drawings. Students will wire trainers simulating an automated system. (Prereq: None) **(EP) 3 cr**

APKG1160 MACHINERY SYSTEMS I
In this course students will set up and troubleshoot packaging machines. Included are manual and automatic cartoners, case loaders and bag closing machines. The basic principles of packaging machinery and materials will be discussed. (Prereq: APKG1125) **(EP) 4 cr**

APKG1165 MACHINERY SYSTEMS II - QUALITY CONTROL
In this course students will set up and troubleshoot packaging machines. Included are form fill and seal, blister packaging, thermoforming and shrink wrapping equipment. The basic principles of the machinery operation will also be discussed. Students will complete a statistical process control chart based on their machine setup. Also included are scales, weighing, checkweighers, package design and testing. (Prereq: None) **(EP) 3 cr**

APKG1170 MACHINERY SYSTEMS III
This course is designed for persons involved with production machine maintenance, automated packaging machinery systems machine engineering and manufacturing technologies. Also included are application setup, troubleshooting and repair of labeling, bar coding, conveying, accumulating and palleting equipment. (Prereq: None) **(EP) 3 cr**

APKG1180 ELECTRICITY II
This course is designed for persons involved with industrial maintenance on automated production machines, packaging machinery and robots. The students will learn single-phase and three-phase principles, AC motors, DC motors and controls. Also included are stepper and servo motion principles, programming and applications. (Prereq: None) **(EP) 3 cr**

APKG1190 INTRODUCTION TO PROGRAMMABLE LOGIC CONTROLLERS
This is an introduction to programmable controllers. The student will be introduced to the programmable controller, new terms, hardware, software, programming methods, addressing, instruction sets, and hardware configuration. (Prereq: None) **(EP) 3 cr**

APKG1200 INTRODUCTION TO ROBOTICS
This course is designed to allow students to program, set up and operate robots and robotic equipment. Teach pendant and PC programming will be utilized. Integration of robots with machine tools, conveyors and other applications will also be explored. (Prereq: METS1000) **(EP) 2 cr**

APKG2100 ADVANCED INDUSTRIAL CONTROLS
This course is designed for all persons in the field of automation. Students study the operation of single and three-phase motor controls, solid state control devices, application of electric heat, photoelectric devices and other components related to industrial controls. The student will design, wire and troubleshoot electrical circuits using ladder line logic. The course includes three-phase power circuits and programming robots used in automated assembly and packaging. (Prereq: APKG1155) **(EP) 4 cr**

APKG2105 AUTOMATED MOTION CONTROL
This course is a study of fundamental principles of hydraulic and pneumatic systems for persons involved with production machine maintenance, automated packaging machinery systems, machine design/drafting, fluid power, machine shop, and C.I.M. engineering and manufacturing technologies. It includes set up and troubleshooting of various hydraulic and pneumatic components and functions used on automated machines. (Prereq: None) **(EP) 2 cr**

APKG2110 PROGRAMMABLE LOGIC CONTROLLERS
This course is designed to give the student advanced knowledge of Programmable Logic Controllers. The student will work with logic concepts, programmable controller program development, I/O configuration and translation from hardware to programmed logic. The student will develop, edit and troubleshoot programs employing basic logic, timers, counters, sequencers, and master control relay logic. Persons involved with automation or robotics should consider this entry-level, hands-on course. (Prereq: APKG1190) **(EP) 4 cr**

APKG2150 PACKAGING MACHINE DESIGN AND COMPONENT FABRICATION
This course involves the selection of materials and manufacturing methods for fabricating machinery components and computer-aided drafting. It includes sketching, drawing, and machine design. Students will design and build a project selected by the instructor or the student. (Prereq: None) **(EP) 2 cr**

APKG2181 INTERNSHIP
This course will introduce the student to on-the-job training in the field of Automated Machinery Systems Packaging. (Prereq: Complete a minimum of 15 credits in the technical core of the Automated Machinery Systems Packaging curriculum and instructor approval) **(EP) 4 cr**

ARCH1000 INTRODUCTION TO ARCHITECTURAL DRAFTING
This course will introduce the student to the Architectural Drafting profession. Topics covered include office practices and procedures, material and product symbols, drawing standards and dimensioning practices. These principles will be used to create light framed building component drawings to form a set of construction documents. (Prereq: None) **(BP/EP) 3 cr**

ARCH1006 ARCHITECTURAL DRAFTING I
This course will introduce the student to the process of designing and drafting a single-story residential dwelling based on current design criteria and applicable codes. (Prereq: ARCH1000 or equivalent and ARCH1201) **(BP/EP) 3 cr**

ARCH1010 ARCHITECTURAL DRAFTING II
This course will continue to reinforce sound drafting practices and design processes for the production of working drawings for a split-entry/split-level dwelling. (Prereq: ARCH1006) **(BP/EP) 2 cr**

ARCH1015 ARCHITECTURAL DRAFTING III
The student will demonstrate sound design principles when producing construction drawings for a two-story dwelling based on design criteria provided using the computer as the drawing tool. (Prereq: ARCH1006, ARCH1100 and ARCH1201) **(BP/EP) 3 cr**

ARCH1100 ARCHITECTURAL CAD: 2D AUTOCAD
This course will introduce the student to the use of the computer in the preparation of architectural working drawings. Topics to be covered include CAD terminology, drawing commands, organization and processes and plotting. Architectural drawing projects are included in this course. (Prereq: None) **(BP/EP) 4 cr**

ARCH1105 BASIC SOFTPLAN CAD
This course is designed for everyone, although some general computer experience would be useful. The course covers the drawing of a simple house from the initial design phase through completion of floor plans, elevations, and sections. This course also includes an introduction to roof generation, object offsets, and 3D rendering. Upon completion of course attendees should be familiar enough with SoftPlan drawing techniques that they will be able to confidently begin drawing on their own. (Prereq: None) **(EP) 3 cr**

ARCH1201 MATERIALS AND METHODS OF CONSTRUCTION I
This course will familiarize the student with how a house is constructed, codes governing residential construction and the selection of materials to be used. Topics to be covered include foundations, floor systems, wall framing, ceiling/roof framing and interior and exterior finishes. (Prereq: None) **(BP/EP) 3 cr**

ARCH1205 STRENGTH OF MATERIALS I
This course is designed to acquaint the student with basic structural engineering principles and practices as they apply to the architectural drafting profession. Topics to be covered include the basic principles of structural mechanics, the design of wood beams and columns and the fastening of structural wood elements. (Prereq: None) **(BP/EP) 4 cr**

ARCH1210 ESTIMATING I
This course is designed to introduce the student to the principles and procedures of estimating residential building material quantities. Topics to be covered include: concrete, masonry, wood framing and exterior and interior finishes. (Prereq: None) **(BP/EP) 2 cr**

ARCH1225 TECHNICAL DRAWING
The student will demonstrate isometric and orthographic drawings. (Prereq: None) **(BP/EP) 1 cr**

ARCH1230 SKETCHING
The student will demonstrate an ability to sketch in 2-D in both pencil and ink. (Prereq: None) **(BP/EP) 1 cr**

ARCH1245 SURVEYING FOR ARCHITECTURAL TECHNICIANS
The student will be exposed to the basic principles of Lot Surveys. Setting up the instruments, measuring, determining elevations and drawing contour maps will be covered. (Prereq: None) **(BP/EP) 1 cr**

ARCH1255 PLANNING CONSIDERATIONS
This course will introduce the student to residential planning considerations that will affect the design and construction of a residence. Topics to be covered will be: kitchen and bath design, electrical design and the residential energy code. (Prereq: None) **(BP/EP) 3 cr**

ARCH2120 ARCHITECTURAL DRAFTING IV
This is an advanced drafting course that is open to all students who have completed the drafting requirements from the first year of the architectural program. The purpose of the course is to introduce students to the requirements involved in producing a working drawing as a means of visual communication with the builder and the developer. The subject matter will continue to be fundamental elements of computer drafting and an understanding of materials used for this project. The emphasis is to provide the student with the technical knowledge needed to understand construction. Students will be expected to gain basic skills as well as personal development with the use and understanding of load bearing masonry, wall and steel framing systems. (Prereq: ARCH1015) **(BP/EP) 4 cr**

ARCH2140 ARCHITECTURAL DRAFTING V
This is an advanced drafting course that is open to all students who complete the first year of the Architectural Drafting program. This course is similar to Architectural Drafting IV in structure and has the same prerequisites. Students who have started the Architectural Drafting program the second semester and have completed the required prerequisites may take Architectural Drafting V, preceding Architectural Drafting IV. The major emphasis with this course is the introduction of poured concrete and precast concrete as required building materials. The course also includes lecture, lab work, handouts and graphic analysis. (Prereq: ARCH1015) **(BP/EP) 4 cr**

ARCH2145 REMODEL DRAWING
This course is open to all second year students who have completed Commercial Computer Lab I. This drawing project is a continuation of Lab I. The subject matter is the fundamental requirements of remodeling and adding to an existing project. This would include explaining to the contractor what existing work is changing and what is new construction by producing a new working drawing. The emphasis is on using new symbols for the existing building, showing walls that are to be removed and new construction on the same drawing. Using the computer as the media and existing drawings, the student may increase personal development and understanding of using existing information and increasing the awareness of computer use. (Prereq: ARCH2120) **(BP/EP) 4 cr**

ARCH2330 ARCHITECTURAL PRESENTATION
This second year course will provide an understanding of visual 2D presentation drawings and how these drawings can be used as a means of communication with the client. The content of the course will cover fundamental elements of drawing layout and scale. This course is intended to increase drafting ability by developing line value, line texture using hatch fill solid, line widths and percentages. The student will select an individual building project and with the use of a computer and scanner, layout plans, elevations and a building section. The student will need to express artistic ability to accomplish this project. (Prereq: ARCH1100) **(BP/EP) 3 cr**

ARCH2340 DESIGN DEVELOPMENT FOR ARCHITECTURAL DRAFTING
This course is intended to give the student experience in pre-construction drawing and drafting requirements. The objectives are to experience drawing and sketching and to produce layout work required before the working drawings are started. The student will be involved in the development process which will include circulation diagrams and square footage studies for a project of the students choice. A study model of the student selected project is required. Lectures should encourage students to develop their own interests and understanding of architecture. (Prereq: ARCH1100) **(BP/EP) 3 cr**

ARCH2350 ARCHITECTURAL CAD: 3D AUTOCAD
This course is an introduction to 3-dimensional drawing using AutoCAD software. Class sessions will introduce the student to 3D coordinate systems, methods of viewing 3D objects, creating 3D wireframe, surface and solid models, and rendering 3D objects. There will be drawing assignments with each lecture followed by a final lab project. A basic knowledge of AutoCAD is necessary. (Prereq: ARCH1100 or instructor approval) **(BP/EP) 3 cr**

ARCH2360 ARCHITECTURAL CAD: ARCHITECTURAL DESKTOP (ADT)

This course will introduce the student to the use of Autodesk Architectural Desktop (ADT). ADT combines AutoCAD drafting tools with new, intelligent architectural objects. The student will learn how to draw and manipulate these objects and learn how they relate intelligently with one another. Topics include drawing objects (such as walls, doors and windows), creating and modifying wall, door and window styles along with the use of other ADT features and commands. (Prereq: ARCH1100 or previous architectural AutoCAD experience) **(BP/EP) 4 cr**

ARCH2370 ARCHITECTURAL CAD: REVIT

This course will introduce the student to the basics of producing drawings and construction documents using the latest release of Autodesk's parametric modeling software, Revit. (Prereq: Completion of ARCH1100, prior AutoCad experience, or Instructor's approval) **(BP/EP) 4 cr**

ARCH2465 MATERIALS AND METHODS OF CONSTRUCTION II

This course will introduce the student to the materials and methods commonly encountered in large-scale construction projects. Consideration will be given to the materials, their properties, application techniques and construction practices. Materials to be examined include steel, concrete, masonry, interior and exterior finishes and waterproofing. (Prereq: None) **(BP/EP) 3 cr**

ARCH2480 ARCHITECTURAL PROCEDURES

This course is intended to increase the students awareness of the construction industry and to have an understanding of the different organizations and groups that are part of this industry. This lecture course will provide an overview of the owner, developer, architectural office and construction contractors and their responsibilities in performing agreements and contracts. This course should provide an opportunity to study office organization, personnel relationships, project management and the requirements of building codes, construction phases, specifications and construction performance. This should broaden the students knowledge of job availability in different areas within the construction industry. (Prereq: None) **(BP/EP) 1 cr**

ARCH2560 ESTIMATING II

This course will provide a basis for understanding estimating and will enable the student to participate in the creative process of organizing an estimate for the purpose of construction. The student will explore the construction estimators responsibilities in providing a cost estimate based on construction drawings and specifications as provided by the instructor. Throughout the course the student will examine the importance of organizing and estimate for materials and labor cost. This will involve lecture and discussion of construction and possible construction techniques or methods of construction. The intent of the course requirements is to have the student assemble a working notebook of the estimate with sketches and notes. This notebook will assist the student with midterm and final evaluations. (Prereq: ARCH1210) **(BP/EP) 3 cr**

ARCH2580 STRENGTH OF MATERIALS II

The purpose of this course is to introduce the student to structural systems and to appreciate the significance of the engineering field. The course is an examination of structural forces and properties on both horizontal and vertical structural components. Simple loading forces will be examined for simple spans. The course is a continuation of Strength of Materials I and will present the elements and performance of steel and concrete construction materials as they are used in the construction industry. (Prereq: ARCH1205) **(BP/EP) 3 cr**

ARCH2640 ARCHITECTURAL ANALYSIS

Architectural analysis introduces the student to architectural history through development of architectural form and material use. The course is based on western cultures and will include major examples in architecture from Egyptian through European Renaissance to American Colonial architecture to present post modern architecture. This course will provide a basis for understanding of architecture from the perspective of a creative process. A visual look at architectural forms that shape the western world will be explored through the use of slides. The main objective of this course will be to develop student appreciation of past architectural work and to recognize traditional values in architecture. Because of the slides presented daily regular attendance is critical. (Prereq: None) **(BP/EP) 3 cr**

ARCH2710 ARCHITECTURAL MODEL BUILDING

This course is designed to give the student basic knowledge of the fundamentals of architectural model building and to offer the student practical experience in applying illustration board, ink and wood for the purpose of analyzing building design. The emphasis of the course is on presentation work for problem solving and client communication. (Prereq: None) **(BP/EP) 3 cr**

ARSP1021 BASIC AUDIO RECORDING AND EQUIPMENT

This course is an introduction to the theory of sound and its recording and reproduction. The student will apply the knowledge gained to the audio recording and reinforcement processes. (Prereq: None) **(EP) 3 cr**

ARSP1100 INTRODUCTION TO RECORDING

This course is an introduction to the theory of sound and the recording process. The course introduces audio terminology, principles of sound and hearing, parts of basic equipment, recorder operation and signal storage methods. (Prereq: None) **(EP) 3 cr**

Course Descriptions

ARSP1110 STUDIO OPERATIONS
The lecture portion of this course covers the basic operational systems of the recording studio, setup and signal flow of consoles, patchbays and studio documentation. The lab covers practical application of the theories and concepts learned in the lecture. (Prereq: Prereq. or concurrent ARSP1100. (Prereq. ARSP1130 or instructor approval) **(EP) 4 cr**

ARSP1130 AUDIO TRANSDUCERS
This course covers theory, characteristics and operation of microphones, loudspeakers, crossovers and speaker/room considerations in the monitoring environment. (Prereq: This course should be taken concurrently with ARSP1100 and ARSP1110 or instructor approval) **(EP) 3 cr**

ARSP1140 CRITICAL LISTENING
This course introduces the student to listening critically and analytically in order to evaluate sound quality and to analyze common sound problems. (Prereq: None) **(EP) 1 cr**

ARSP1300 MULTITRACK RECORDING THEORY I
This course examines the practical techniques of multitrack recording. Topics include session operating procedures, linear and disk-based digital recording techniques, the integration of virtual and live tracks, analog recording procedures, digital console signal flow, session management, audio production, and basic A for V techniques. (Prereq: ARSP1100, ARSP1110, ARSP1130 or instructor approval. This course should be taken concurrently with ARSP1310, ARSP1320, ARSP1331, and ARSP2120) **(EP) 3 cr**

ARSP1310 MULTITRACK RECORDING LAB I
This course covers practical applications of techniques and theory covered in Multitrack Recording Theory I and is to be taken concurrently. The student will produce various music projects. (Prereq: ARSP1100 and ARSP1110. Prereq. or concurrent ARSP1300 or instructor approval. This course should be taken concurrently with ARSP1300, ARSP1320, ARSP1331, and ARSP2120) **(EP) 3 cr**

ARSP1320 AUDIO SIGNAL PROCESSING
This course covers the theory and operation of audio signal processors. In lectures, discussions and labs, students are introduced to functions and parameters of EQ's, VGA's, Delays and Reverbs. (Prereq: ARSP1100, ARSP1110 or instructor approval. This course should be taken concurrently with ARSP1300, ARSP1310, ARSP1331, and ARSP2120) **(EP) 3 cr**

ARSP1331 INTRODUCTION TO MIDI
This course covers basic MIDI (Musical Instrument Digital Interface) principles and techniques, the virtual studio concept, software, hardware, sequencers, sound design, and MIDI applications in Audio for Video. (Prereq: ARSP1100, ARSP1110, ARSP1130, CPLT1200 or instructor approval. This course should be taken concurrently with ARSP1300, ARSP1310, ARSP1320, and ARSP2120) **(EP) 3 cr**

ARSP1340 LOCATION RECORDING
This course covers the fundamentals and basic techniques used in non-studio recording for news gathering, conference, public speaking, music and sound effects recording. The main emphasis will be hands-on and students will record, edit and mix a variety of location projects. (Prereq: None) **(EP) 2 cr**

ARSP1350 MUSIC THEORY
This course covers fundamental concepts of rhythm, song structure, note values and the circle of fifths. (Prereq: None) **(EP) 2 cr**

ARSP1370 INDEPENDENT STUDY
In this course, the student will research and apply focused production techniques as identified by the student and agreed upon by the instructor. (Prereq: Instructor approval) **(EP) 1-4 cr**

ARSP1380 PRODUCTION LAB I
In this course the student will improve production skills learned by working on client based projects. (Prereq: Instructor approval) **(EP) 3 cr**

ARSP1390 PRODUCTION LAB II
In this course the student will improve production skills learned by working on client based projects. (Prereq: Instructor approval) **(EP) 3 cr**

ARSP1500 MULTITRACK RECORDING THEORY II
This course is a continuation of the practical techniques of multitrack recording covered in Multitrack Recording Theory I. Topics include: advanced production techniques, advanced linear and disk-based digital recording techniques, advanced consoles and automation, mixing techniques, basic troubleshooting, advanced A for V concepts, and career strategies. (Prereq: ARSP1300 and ARSP1310. Prereq. or concurrent ARSP1320, ARSP1331, ARSP1510 and ARSP2120 or instructor approval) **(EP) 3 cr**

ARSP1510 MULTITRACK RECORDING LAB II
This course covers practical applications of techniques and theory covered in Multitrack Recording Theory II and is to be taken concurrently. The student will record and mix various music projects. (Prereq: ARSP1500 or instructor approval) **(EP) 3 cr**

ARSP1531 USING MIDI EQUIPMENT
This course is a continuation of the basic MIDI principles and techniques covered in Introduction to MIDI, with emphasis on advanced sound design, MIDI and disk-based digital recording integration, waveform/sample editing, and A for V ADR techniques. (Prereq: ARSP1331 or instructor approval) **(EP) 3 cr**

ARSP1541 ACOUSTICS AND RECORDING STUDIO DESIGN

This course covers principles of sound, room measurement techniques and a discussion of the acoustical properties of room materials and their effect on room acoustics. Special emphasis will be given to cost effective studio design, or more specifically, how to build a recording studio with a limited budget. (Prereq: ARSP1021, ARSP1100 or instructor approval) **(EP) 2 cr**

ARSP2100 MULTITRACK RECORDING THEORY III (DIGIDESIGN 210P)

This course is a continuation of the practical techniques of multitrack recording cover in Multitrack Recording Theory II. Topics include: mastering, beauty reel assembly, advanced session management skills, and specialized equipment applications. (Prereq: ARSP1500 and ARSP1510. This course should be taken concurrently with ARSP2110) **(EP) 1 cr**

ARSP2110 MULTITRACK RECORDING LAB III

This course covers practical applications of techniques and theory covered in Multitrack Recording Theory III. The student will record and mix various music projects. (Prereq: ARSP2100 should be taken concurrently or instructor approval) **(EP) 2 cr**

ARSP2115 AUDIO MIXING TECHNIQUES

This course covers advanced mixing techniques on both digital and analogue mixing consoles, and basic digital mastering. (Prereq: Instructor approval) **(EP) 2 cr**

ARSP2120 DIGITAL AUDIO THEORY (DIGIDESIGN 101)

This course covers principles and practical applications of digital audio recording and editing, emphasizing disk-based random access systems. Successful completion of this course will result in AVID 135 certification and the completion of the AVID 135 curriculum. (Prereq: ARSP1100, ARSP1110, ARSP1130 or instructor approval) **(EP) 3 cr**

ARSP2130 AUDIO FOR VIDEO THEORY

This course covers basic SMPTE time code techniques, audio/video synchronizers, synthesizer/SMPTE synchronization and audio sweetening for video post-production. (Prereq: ARSP2120 or instructor approval) **(EP) 2 cr**

ARSP2135 AUDIO FOR VIDEO LAB

This lab course is taken concurrently with ARSP2130. Students will intern with a local cable access television studio or post-production house in order to apply skills being learned in ARSP2130. (Prereq: ARSP2130 or instructor approval) **(EP) 2 cr**

ARSP2150 MUSIC BUSINESS

This course covers legal and business topics that pertain to the music industry such as equipment purchasing/leasing, studio rate negotiation, financing, contracts and publishing. (Prereq: None) **(EP) 2 cr**

ARSP2170 LIVE SOUND REINFORCEMENT I

This course covers the basic operational systems for live sound reinforcement, set up and signal flow of consoles, effects racks, snakes, microphones, amps and crossovers, speaker systems and live sound reinforcement documentation. (Prereq: ARSP1100 and ARSP1110 or instructor approval) **(EP) 2 cr**

ARSP2315 ADVANCED MIXING TECHNIQUES

This course covers advanced mixing techniques on: digital, analogue and Pro Tools mixing consoles; advanced automation techniques; and digital mastering for duplication and release. In lectures, demonstrations and labs, students will learn advanced signal processing and automated mixing techniques to achieve finished masters. (Prereq: ARSP2115 and ARSP2120) **(EP) 3 cr**

ARSP2325 DIGITAL AUDIO THEORY II (DIGIDESIGN 201/210M)

This course covers advanced applications of digital audio recording and editing and emphasizing mixing techniques of Pro Tools systems. Successful completion of this course will result in AVID certification and completion of the AVID 235 curriculum. (Prereq: ARSP2120) **(EP) 3 cr**

ARSP2340 STUDIO MAINTENANCE AND CALIBRATION

This course reviews basic electronics and sound principles and discusses set up, calibration and operation of recording equipment. Topics include studio layout and signal routing, equipment interface, grounding and maintenance. (Prereq: None) **(EP) 2 cr**

ARSP2370 INDEPENDENT STUDY II

In this course the student will develop an individual recording project or research topic based on student interests and needs. (Prereq: Instructor approval) **(EP) 1-4 cr**

ARSP2380 PRODUCTION LAB III

In this course the student will improve production skills learned by working on client-based projects. (Prereq: Instructor approval) **(EP) 3 cr**

ARSP2390 PRODUCTION LAB IV

In this course the student will improve production skills learned by working on client-based projects. (Prereq: Instructor approval) **(EP) 3 cr**

ARSP2580 AUDIO RECORDING INTERNSHIP I

This is a cooperative program between Hennepin Technical Colleges' Audio Recording Program and professional production facilities to allow the student an employment-like work experience. (Prereq: Completion of 48 credits or instructor approval) **(EP) 2 cr**

ARSP2585 AUDIO RECORDING INTERNSHIP II

This is a cooperative program between Hennepin Technical Colleges' Audio Recording Program and professional production facilities to allow the student an employment-like work experience. (Prereq: Completion of 48 credits or instructor approval) **(EP) 2 cr**

Course Descriptions

ARSP2590 AUDIO RECORDING INTERNSHIP III
This is a cooperative effort between Hennepin Technical College and professional audio recording facilities to allow the students employment-like work experience.
(Prereq: ARSP2585 and instructor approval) **(EP) 2 cr**

ARSP2595 AUDIO RECORDING INTERNSHIP IV
This is a cooperative effort between Hennepin Technical College and professional audio recording facilities to allow the students employment-like work experience.
(Prereq: ARSP2585 and instructor approval) **(EP) 2 cr**

ATEC1100 TRADE KNOWLEDGE
This course is designed to give the student an overview of the automotive industry. It will also give the student a working knowledge of hand tools and other auto specialized tools and general maintenance procedures. It includes practical hands-on general maintenance work. (Prereq: None) **(BP/EP) 2 cr**

ATEC1200 CLUTCH AND DRIVESHAFT
In this course the student will learn the operation, service and repair of various types of vehicle clutches. It includes fundamentals, removal and installation on a vehicle.
(Prereq: None) **(BP/EP) 2 cr**

ATEC1220 MANUAL TRANSMISSION AND TRANSAXLE
In this course the student will learn the operation, service and repair of manual transmissions and transaxles. It includes fundamentals, disassembly, inspection, adjustments and reassembly. (Prereq: None) **(BP/EP) 2 cr**

ATEC1240 DIFFERENTIALS
In this course the student will learn the various differential designs of rear-wheel drive vehicles. It includes fundamentals, disassembly and assembly of both conventional and limited slip differentials. (Prereq: None) **(BP/EP) 1 cr**

ATEC1260 AUTOMATIC TRANSMISSION
In this course the student will learn the operation, service and repair of rear-wheel drive automatic transmissions. It includes fundamentals, disassembly and assembly, adjustment and operation and testing. (Prereq: None) **(BP/EP) 3 cr**

ATEC1265 AUTOMATIC TRANSAXLES
In this course the student will learn the operation, service and repair of automatic transaxles. It includes fundamentals, disassembly and assembly, adjustment and operation and testing. (Prereq: ATEC1260) **(BP/EP) 2 cr**

ATEC1300 BRAKES
In this course the student will learn the skills needed to perform complete repairs on automotive brake systems. It includes system operation, repair of hydraulic system components, machining and repair of drum and disc brake systems. (Prereq: None) **(BP/EP) 2 cr**

ATEC1320 STEERING AND SUSPENSION
In this course the student will learn the designs, operation and basic skills to repair steering and suspension systems. It includes diagnosis and component, overhaul and replacement.
(Prereq: None) **(BP/EP) 2 cr**

ATEC1340 ALIGNMENT AND BALANCE
In this course the student will learn to perform two and four wheel alignment procedures on conventional and McPherson strut suspension systems. It also includes tire construction, vibration diagnosis and electronic balancing.
(Prereq: ATEC1320) **(BP/EP) 2 cr**

ATEC1400 UPPER ENGINE
In this course the student will learn the operation of engine valve trains and cooling systems. This will include basic engine theory of operation, types of cylinder head valve train operation and service. It also includes cooling system operation and service. (Prereq: None) **(BP/EP) 2 cr**

ATEC1440 LOWER ENGINE
In this course the student will learn the basic skills in engine cylinder block and component repairs. This will include service procedures of crankshafts, bearings, pistons, rings, and oil pumps. (Prereq: ATEC1400) **(BP/EP) 2 cr**

ATEC1500 BASIC ELECTRICITY
In this course the student will learn the fundamentals of automotive electricity along with the skills needed to test and diagnose all types of electrical circuits and component problems. It includes theory, analog and digital meter use, Ohm's law, electromagnetism, circuits and wiring diagrams, battery operation and testing. (Prereq: None) **(BP/EP) 3 cr**

ATEC1530 CHASSIS ELECTRICAL
In this course the student will learn the operation of electrical circuits that are common on the automobile. These will include circuit testing and repair of lighting, turn signal, warning lamp, gauges, blower motor, wiper and accessory circuits. The student will have hands-on training on anti-lock brakes, supplemental inflatable restraints and body computer circuits. (Prereq: ATEC1500) **(BP/EP) 3 cr**

ATEC1550 STARTING AND CHARGING SYSTEMS
In this course the student will learn the operation of automotive cranking and charging systems. This will include battery testing, battery service, testing and repairing of cranking motors, alternators, starter control and charging system circuits. (Prereq: ATEC1500) **(BP/EP) 2 cr**

ATEC1580 AIR CONDITIONING AND HEATING
In this course the student will learn the skills needed for automotive air conditioning service. It includes system theory of operation, temperature-pressure relationships of R-12 and R134a refrigerants, performance testing, reclaiming, recycling and recharging air conditioning systems. (Prereq: None) **(BP/EP) 2 cr**

ATEC1600 FUEL SYSTEMS AND TURBOCHARGERS
In this course the student will learn the operation of automotive fuel delivery systems. This will include operation, diagnosis and hands-on service of fuel tanks, filters, carburetors, fuel injection and turbo chargers. (Prereq: None) **(BP/EP) 2 cr**

ATEC1610 IGNITION SYSTEMS
In this course the student will learn the operation of various types of ignition systems both distributor type and distributorless. Hands-on testing and diagnosis procedures are included using various types of testing equipment including engine oscilloscope analyzers. Also included are common tune-up procedures and engine diagnosis used on today's vehicles. (Prereq: ATEC1500) **(BP/EP) 3 cr**

ATEC1630 EMISSION CONTROLS
In this course the student will learn the operation of emission control systems and their purpose and failure results. It includes PCV systems, air management, EGR systems, spark timing controls, catalytic converters and 4 and 5 gas emission testing and diagnosis. (Prereq: None) **(BP/EP) 2 cr**

ATEC1650 GM COMPUTER SYSTEM
In this course the student will learn the operation of GM computerized, carbureted, throttle body injection and port fuel injection systems. It includes operation of all input sensors, output devices, testing procedures, use of diagnostic scan tools and diagnostic troubleshooting charts. (Prereq: ATEC1500 and ATEC1610) **(BP/EP) 3 cr**

ATEC1670 FORD COMPUTER SYSTEM
In this course the student will learn the operation of Ford EEC IV computer systems. It includes theory of operation, testing equipment and procedures, diagnostic pinpoint testing and repair. (Prereq: ATEC1630) **(BP/EP) 2 cr**

ATEC1675 CHRYSLER COMPUTER SYSTEM
In this course the student will learn the operation of Chrysler powertrain computer systems used on carbureted, throttle body and port fuel injected engines. It includes operation, test procedures using computer scan testers, diagnosis and repair. (Prereq: None) **(BP/EP) 2 cr**

ATEC2150 AUTOMOTIVE PRODUCTION LAB I
This course is designed to provide the student with the opportunity to develop skills needed to work in a general automotive repair shop. These skills include customer relations as well as diagnosis and repair of various types of cars and light trucks. The repair work will be as diverse as it is in industry and will require a number of different resources for repair information including previously completed coursework. (Prereq: Instructor approval) **(BP/EP) 2 cr**

ATEC2155 AUTOMOTIVE PRODUCTION LAB II
This course is designed to provide the student with the opportunity to continue to develop the skills needed to work in a general automotive repair shop. These skills include customer relations as well as diagnosis and repair of various types of cars and light trucks. The repair work will be as diverse as it is in industry and will require a number of different resources for repair information including previously completed coursework. (Prereq: Instructor approval) **(BP/EP) 2 cr**

ATEC2160 AUTOMOTIVE PRODUCTION LAB III
This course is designed to provide the student with the opportunity to continue to develop the skills needed to work in a general automotive repair shop. These skills include customer relations as well as diagnosis and repair of various types of cars and light trucks. The repair work will be as diverse as it is in industry and will require a number of different resources for repair information including previously completed coursework. (Prereq: Instructor approval) **(BP/EP) 3 cr**

ATEC2165 AUTOMOTIVE PRODUCTION LAB IV
This course is designed to provide the student with the opportunity to continue to develop the skills needed to work in a general automotive repair shop. These skills include customer relations as well as diagnosis and repair of various types of cars and light trucks. The repair work will be as diverse as it is in industry and will require a number of different resources for repair information including previously completed coursework. (Prereq: Instructor approval) **(BP/EP) 3 cr**

ATEC2170 AUTOMOTIVE PRODUCTION LAB V
This course is designed to provide the student with the opportunity to develop skills needed to work in a general automotive repair shop. These skills include customer relations as well as diagnosis and repair of various types of cars and light trucks. The repair work will be as diverse as it is in industry and will require a number of different resources for repair information including previously completed coursework. (Prereq: Instructor approval) **(BP/EP) 2 cr**

ATEC2175 AUTOMOTIVE PRODUCTION LAB VI
This course is designed to provide the student with the opportunity to develop skills needed to work in a general automotive repair shop. These skills include customer relations as well as diagnosis and repair of various types of cars and light trucks. The repair work will be as diverse as it is in industry and will require a number of different resources for repair information including previously completed coursework. (Prereq: Instructor approval) **(BP/EP) 2 cr**

ATEC2200 DRIVELINE SERVICE AND REPAIR
This course is designed to develop skills in diagnosing and repairing manual transmissions, transaxles, clutches, drive shafts and differentials. (Prereq: ATEC1200, ATEC1220, ATEC1240, ATEC1260 and ATEC1265) **(BP/EP) 3 cr**

Course Descriptions

ATEC2300 BRAKE REPAIR AND OVERHAUL
This course is designed to provide the student with the skills needed in performing repairs on automotive brake systems. It includes lining replacement, drum and rotor machining and all necessary brake system repairs. (Prereq: ATEC1300) **(BP/EP) 3 cr**

ATEC2400 SUSPENSION REPAIR AND ALIGNMENT
This course is designed to develop the skills in diagnosing, repairing and aligning suspensions. It includes conventional and McPherson strut types of front and rear suspensions and computerized four-wheel alignment. (Prereq: ATEC1320 and ATEC1340) **(BP/EP) 3 cr**

ATEC2680 AUTOMOTIVE TECHNICIAN INTERNSHIP
This course is designed for the student who wants to practice skills in an on-the-job situation located in industry. The student may be able to direct his/her efforts in the specialized area of choice. On-the-job work experience provides much needed experience and an opportunity for full-time employment upon program completion. (Prereq: Enrollment in a diploma or certificate program) **(BP/EP) 1-8 cr**

ATEC2685 AUTOMOTIVE INDUSTRY INTERNSHIP I
This course will provide the student with on-the-job training on site in the automotive industry. The student will use the knowledge gained in previous courses by developing their skills on customers' vehicles at a vehicle repair company. (Prereq: ATEC1100, ATEC1200, ATEC1220, ATEC1240, ATEC1300, ATEC1530, ATEC1550, ATEC1580, and ATEC1610) **(BP/EP) 5 cr**

ATEC2690 AUTOMOTIVE INDUSTRY INTERNSHIP II
This course will provide the student with on-the-job training on site in the automotive industry. The student will use the knowledge gained in previous courses by developing their skills on customers' vehicles at a vehicle repair company. (Prereq: ATEC1265, ATEC1340, ATEC1440, ATEC1600, ATEC1650, ATEC1670, ATEC1675, and ATEC2685) **(BP/EP) 5 cr**

CARP1100 INTRODUCTION TO RESIDENTIAL CONSTRUCTION
This course is designed to introduce students to terms, materials and procedures used to construct a residence. It is not intended to give a working knowledge of the trade. (Prereq: None) **(BP/EP) 1 cr**

CARP1111 FLOOR AND WALL FRAMING
This course covers floor and wall framing. It is designed to introduce students to framing materials used to build floors and walls and a working knowledge of layout and framing practices. (Prereq: None) **(BP/EP) 5 cr**

CARP1130 ADDITIONS AND RETROFIT
This course introduces the student to construction processes used to attach and/or modify rooms, porches and garages. (Prereq: None) **(BP/EP) 2 cr**

CARP1140 ENGINEERED ROOF SYSTEMS
This course will introduce the student to some of the engineer designed products used to support the roof on a house. Students will then use this information to build one or more roofs. (Prereq: None) **(BP/EP) 2 cr**

CARP1150 RAFTER FRAMING
This course is designed to provide the opportunity for students to layout, cut and install rafters. Projects may include a full scale roof, a shed roof, Cape Cod dormers and snub gables. (Prereq: None) **(BP/EP) 3 cr**

CARP1180 STAIR FRAMING
This course introduces the student to the theory of stair layout, cutting and installation of stringers and landings. (Prereq: None) **(BP/EP) 2 cr**

CARP1185 STAIR LAYOUT
This is an advanced course for students working in the carpentry trade wanting to upgrade their skills in the theory of stair layout, cutting and installation of stringers and landings. (Prereq: One year minimum work experience) **(BP/EP) 1 cr**

CARP1190 DECK CONSTRUCTION
This course is an introduction to deck building for the carpentry student or homeowner. This course will touch on design/code requirements. The student will install footings, frame the floor, install decking, install railings and stairs as needed. (Prereq: None) **(BP/EP) 1 cr**

CARP1210 RESIDENTIAL ROOF COVERINGS
This course provides the student an opportunity to install residential roof coverings. (Prereq: None) **(BP/EP) 1 cr**

CARP1220 SIDING
This course will introduce students to various types of siding and provide the student the opportunity to install several different products. (Prereq: None) **(BP/EP) 2 cr**

CARP1230 CORNICE
This course will introduce the students to various types of cornice and provides the opportunity to install one or more types of cornice. (Prereq: None) **(BP/EP) 1 cr**

CARP1420 CONCRETE STAIRS, WALKS AND DRIVES
This course introduces the student to procedures used to form, pour and finish concrete stairs, walks and driveways. (Prereq: None) **(BP/EP) 1 cr**

CARP1430 INSTALL CONCRETE SLABS
This course introduces the student to the procedures used to form, pour and finish concrete slabs. (Prereq: None) **(BP/EP) 1 cr**

CARP1511 INSULATION AND DRYWALL
This course introduces the student to the proper ty values of insulation and gypsum wallboard and proper installation of both. (Prereq: None) **(BP/EP) 3 cr**

CARP1710 STAIR FINISHING
This course will introduce the students to the fundamentals of finishing an open and closed stair. It will include the application of treads, risers and railing par ts. (Prereq: None) **(BP/EP) 2 cr**

CARP1720 INTERIOR TRIM
This course introduces the student to interior trim. It will include the installation of jamb sets, pre-hung doors, door and window casing, moldings and har dware. (Prereq: None) **(BP/EP) 4 cr**

CARP1760 CABINET MAKING
This course introduces the student to the elements of cabinet construction such as drawing, cutting and assembly of cabinet body parts, doors, drawing and plastic laminate tops. (Prereq: None) **(BP/EP) 3 cr**

CARP1810 RESIDENTIAL BLUEPRINT READING
This course introduces the student to the fundamentals of blueprints and the reading of residential blueprints through the use of a standar d workbook and constr uction blueprints. (Prereq: None) **(BP/EP) 1 cr**

CARP1820 RESIDENTIAL ESTIMATING
This course introduces the student to estimating materials f or rough framing and interior and exterior f inishing. (Prereq: None) **(BP/EP) 2 cr**

CARP1830 BUILDING CODE
This course is a study of the par ts of the State Building Code that relate to residential constr uction. (Prereq: None) **(BP/EP) 1 cr**

CARP1840 ENERGY EFFICIENT CONSTRUCTION
This course is a study of the State Energy Code and constr uction methods and strategies used to build energy ef ficient houses. (Prereq: None) **(BP/EP) 1 cr**

CARP1850 INTRODUCTION TO COMPUTER ASSISTED DRAWING
This course will introduce students to a com puter program for drawing blueprints. After completing the program, students will be able to draw and dimension a blueprint, inser t windows and doors and accom plish other tasks. (Prereq: None) **(BP/EP) 1 cr**

CBTG1110 BASIC JOINERY
This course is designed to introduce the student to the saf e and proper use of hand and lay out tools used to constr uct basic woodworking joinery. Course emphasis will be the hands-on techniques necessary to produce several required wood joints. (Prereq: None) **(BP/EP) 2 cr**

CBTG1120 POWER TOOL OPERATION
This course is designed to introduce the student to the proper and safe operation and maintenance of the basic w oodworking power tools and stationar y equipment used in the cabinet industry. One or more required projects will be f abricated by the student during the hands-on operation of the tools and equipment covered during this course. (Prereq: N one) **(BP/EP) 3 cr**

CBTG1130 MATERIALS
In this course the student will lear n the various wood and wood products used in cabinetmaking. Solid lumbers, plywoods, veneers, melamines, laminates, abrasives, adhesives and fasteners will be co vered and discussed. (Prereq: N one) **(BP/EP) 1 cr**

CBTG1140 BASIC CASE CONSTRUCTION
This course covers the fundamentals of cabinet constr uction, including project layout, stockbilling and material selection. Basic construction techniques will be co vered and demonstrated. Cabinet projects f or the student are required to achieve the hands-on experience appropriate to the course. (Prereq: CBTG1120) **(BP/EP) 3 cr**

CBTG1150 DRAFTING TECHNIQUES
This course is an application of draf ting techniques as related to cabinetmaking. Draf ting terms, instruments, sketches and drawings will be discussed. V arious drafting illustration methods as well as pictorial views will be co vered. (Prereq: CBTG1140) **(BP/EP) 2 cr**

CBTG1160 BASIC LAMINATING
This course will introduce the student to the v arious types of plastic laminates available, other materials involved, hand tools, adhesives, preparation procedures necessar y for the fabrication and practical application of decorative laminates. Required projects specializing in laminate constr uctions are emphasized. (Prereq: CBTG1120) **(BP/EP) 3 cr**

CBTG1210 LAMINATED PRODUCT FABRICATION
This course is designed to enlarg e the students laminating abilities to complete, ready-to-install kitchen counter tops, vanity tops and production laminating. Counter top installation, custom laminating including post-forming equipment and procedures will be covered. (Prereq: CBTG1120 and CBTG1160) **(BP/EP) 3 cr**

CBTG1220 BLUEPRINT READING AND SHOP DRAWINGS
This course teaches the fundamentals of blueprint reading, how they identify and lead to shop drawings and material listing, together becoming necessar y functioning tools of the cabinetmaking industry. (Prereq: CBTG1140) **(BP/EP) 3 cr**

CBTG1230 WOOD FINISHING
This course is designed to giv e the student a basic understanding of wood finishing materials and finish application methods. Spray equipment is utilized as the f inal finish is applied to wood and wood products. (Prereq: CBTG1120) **(BP/EP) 2 cr**

CBTG1240 MILLROOM OPERATIONS
This course will acquaint the student with millroom operations including knife-grinding procedures and molder setup operation. (Prereq: CBTG1120) **(BP/EP) 2 cr**

CBTG1250 PRODUCTION WOODWORK
This course is designed to introduce the student to planning, organizing and layout of machining operations for production woodworking. Daily production teamwork is emphasized in the class lab atmosphere as production projects of substantial value are fabricated. (Prereq: CBTG1130 and CBTG1140) **(BP/EP) 4 cr**

CBTG2311 CABINET LAYOUT AND DESIGN
This course will introduce the student to fundamentals of cabinet design, hardware implementation, plan preparation and layout of cabinetry. The student will prepare drawings, make hardware selections, and lay out residential face frame cabinets. (Prereq: CBTG1120, CBTG1140 and CBTG1150) **(BP/EP) 3 cr**

CBTG2320 CABINET JOINERY
This course will instruct the student on the various methods of cabinet construction, including detailed analysis of each cabinet component part. Efficient as well as effective methods of wood joinery utilized in face frame cabinetry will be stressed. (Prereq: CBTG2310) **(BP/EP) 3 cr**

CBTG2331 CABINET FABRICATION
This course will teach the student effective and efficient methods of face frame cabinet production. Machining processes, assembly, finishing, handling and installation will be stressed. (Prereq: CBTG2320) **(BP/EP) 4 cr**

CBTG2361 FRAMELESS CABINETRY
This course will introduce the student to the process of designing, drawing and layout, and production of frameless cabinetry. Efficient and effective methods of joinery and fabrication for frameless cabinets will be the focus. Residential and/or commercial cabinets will be constructed. (Prereq: CBTG2311) **(BP/EP) 4 cr**

CBTG2410 FURNITURE DESIGN
In this course the student will learn to identify specific furniture styles and their components. The student will be required to research and design a specific piece of furniture. (Prereq: CBTG1150) **(BP/EP) 2 cr**

CBTG2420 FURNITURE JOINERY
This course will focus on the joinery and techniques involved in the construction of furniture. Specific project work will be accomplished. (Prereq: CBTG2410) **(BP/EP) 3 cr**

CBTG2430 FURNITURE FABRICATION
This course is a study of advanced machine operations in furniture construction techniques. Students will be required to construct a piece of furniture of their own design. (Prereq: CBTG2420) **(BP/EP) 4 cr**

CBTG2440 COMPUTERIZED CABINET LAYOUT AND DESIGN
This course will focus on computerized cabinet planning and layout. The student will complete several projects which include drawings, pictorial views, cutlists, estimates and panel optimizing. Cabnetware software will be utilized. (Prereq: None) **(BP/EP) 3 cr**

CBTG2450 SOLID SURFACE FABRICATION
This course will introduce the student to solid surface materials and focus on industry accepted fabrication techniques. Projects will be constructed. (Prereq: CBTG1120) **(BP/EP) 2 cr**

CBTG2512 AUTOCAD FOR CABINETMAKING
This course will introduce the student to basic AutoCAD techniques used in creating geometric shapes for woodworking shop drawings. (Prereq: None) **(BP) 4 cr**

CBTG2522 CAM PROGRAMMING FOR CNC WOODWORKING ROUTERS
This course will use Router CIM software package to produce tool path code for CNC woodworking routers. Emphasis will be placed on program drawings, file management, geometry consideration and the creation of accurate tool path code for wood and plastic component parts. (Prereq: CBTG2511) **(BP) 3 cr**

CBTG2532 PROGRAMMING AND OPERATION OF CNC WOODWORKING ROUTERS
This course will cover basic programming techniques, set up, operation and maintenance of CNC woodworking routers. Basic manual code creation, controller manipulation, maintenance, tooling, machine orientation and hands-on part manufacturing will be presented. Specific parts will be programmed and machined. (Prereq: CBTG2521) **(BP) 3 cr**

CCDS0800 NEW DIRECTIONS
New Directions is a FREE, daytime workshop for individuals who want to explore a variety of careers. This six week workshop is offered in a supportive environment with individualized attention. New Directions offers interest inventories, aptitude testing, personality type and computer programs for career exploration. Students can explore traditional and nontraditional careers with an on campus tour or visit to the classrooms or labs. (Prereq: None) **(BP/EP) 0 cr**

CCDS0850 CAREER TRANSITION
Career Transitions is a career exploration workshop that is offered to adults who are considering a job change that may require some college coursework. The workshop will utilize inventories/testing to help individuals identify their interests, personality type, skills and aptitudes for a changing workplace. Career Transitions will help individuals access computer software for career research and current labor market information to assist them in their decision making. ($40.00 fee) (Prereq: None) **(BP/EP) 0 cr**

CCIS1000 INFORMATION SYSTEMS
This is a beginning course for Computer Careers and will introduce the student to an overview of the business data processing environment. Topics will include computer hardware and software as well as the functions of computers in industry. This course provides hands-on experience in the computer lab. (Prereq: Sufficient placement test scores) **(BP/EP) 3 cr**

CCIS1031 ACCESS
This course covers the basic functions of a database management package on the microcomputer as applied to business applications. The student will learn how to create a database, maintain records in a table, query a database and print a report. (Prereq: CCIS1000 or CCIS1101) **(BP/EP) 4 cr**

CCIS1035 WORD FOR WINDOWS I
This word processing course will include the creation, editing and formatting of business documents. Students will also learn features including merging, sorting, and creating headers/footers, and footnotes. It may be necessary to have access to a computer outside of class in order to complete the assignments. A student computer lab is available on each campus. (Prereq: CPLT1000 or qualifying score on keyboarding assessment test) **(BP/EP) 3 cr**

CCIS1041 POWERPOINT
This course is for personnel responsible for creating presentations in a business environment. Using the many features of the software, the student will learn to produce slides which include diagrams, clipart, charts and graphs. The student will import data from word processing and spreadsheet software to prepare professional presentations. (Prereq: CCIS1000 or CCIS1101) **(BP) 4 cr**

CCIS1045 WORD FOR WINDOWS II
This course is a continuation of Word for Windows I with emphasis placed on advanced Word features including the use and creation of styles, columns, macros, tables, charts, forms and graphic objects. It may be necessary to have access to a computer outside of class in order to complete the assignments. A student computer lab is available on each campus. (Prereq: CCIS1035) **(BP/EP) 3 cr**

CCIS1080 MICROSOFT OFFICE XP
This course offers a hands-on introduction to popular office software programs. Students will be provided with a Windows overview, the basics of word processing, spreadsheets, databases and presentations. It may be necessary to have access to a computer outside of class in order to complete the assignments. A student computer lab is available on each campus. (Prereq: CPLT1000 or qualifying score on keyboarding assessment test) **(BP/EP) 3 cr**

CCIS1101 WINDOWS XP
This course will provide an introduction to the graphical user interface (GUI) most commonly used, and will give students the necessary skills and background to be successful in other coursework. "The basics" (using a mouse, opening and closing windows and programs, etc.) will be covered for those with little or no previous computer experience. Other topics include shortcuts, search techniques, desktop configuration, printer basics, disk maintenance and disk management. (Prereq: Sufficient placement test scores) **(BP/EP) 3 cr**

CCIS1110 WINDOWS ADMINISTRATION I
This is the first of two courses in network administration using Microsoft Windows 2000 Professional. The course will use Windows 2000 Professional-workstations in a "workgroup" or peer-to-peer configuration, and will cover many configuration and administrative tasks, including the following: accessing network servers & printers, adding & managing user accounts, implementing security, interacting with an active directory structure, installing the operating system, accessing Internet technologies. (Prereq: CCIS1101, CCIS1201 and CCIS1210. CCIS1201 and CCIS1210 can be taken concurrently) **(BP/EP) 3 cr**

CCIS1121 LINUX ADMINISTRATION I
This course will introduce the student to system installation and administration tasks. Students will learn to install Unix (using Linux), administer user accounts, install X-Windows, maintain the file system and set up back-up and recovery procedures. File permissions, printing, shell scripting processes will also be covered. (Prereq: CCIS1201) **(BP/EP) 3 cr**

CCIS1201 DATA COMMUNICATIONS & NETWORK DESIGN
This "lecture-only" course will provide an introduction to networking concepts and technology most commonly used in the global workplace, and will give students the necessary skills & background to be successful in other coursework. Topics covered include the following: network topologies, protocols, standards & regulations, transmission media & speed, and network design & hardware. TCP/IP concepts will be introduced & explained. (Prereq: Sufficient placement test scores) **(BP/EP) 3 cr**

CCIS1210 NETWORKING PRINCIPLES
This course will provide first-semester students with an exposure to several types of duties common to network administration, including using a command (DOS) prompt interface, basic log-in procedures, writing scripts/batch files/programs, and troubleshooting techniques. (Prereq: Sufficient placement test scores and may be taken concurrently with CCIS1201) **(BP/EP) 3 cr**

CCIS1301 HTML USING XHTML
This course will introduce the student to the Internet. The students will learn HTML code by using a simple text editor to place and format text and graphics to be viewed through a web-browser. Use of links, tables, menus, forms, plug-ins, and other topics will also be covered. (Prereq: CCIS1000 and CCIS1101) **(BP/EP) 3 cr**

CCIS1310 PUBLISHER
Microsoft Publisher is a popular desktop publishing program that uses the Windows operating system. You will learn to plan, design and create publications such as brochures, flyers and newsletters. Publisher also has Web capabilities and graphics tools that make it easy to create multi-page Web sites. You will then publish professional-looking Web sites with attractive backgrounds, useful navigation bars, and links. (Prereq: CCIS1101 or equivalent Windows experience) **(BP) 3 cr**

CCIS1320 FRONTPAGE
This is a course that gives students an introduction to creating Web pages using MS FrontPage. The underlying HTML code is also covered to aid the learning process. Skills are mastered via hands-on exercises and examples. (Prereq: CCIS1101 and CCIS1301) **(BP) 3 cr**

CCIS1325 WEB PUBLISHING
This course gives students an introduction to publishing and maintaining Web sites using several different software packages. The underlying HTML code is also covered to aid the learning process. Skills are mastered via hands-on exercises and examples. (Prereq: CCIS1101 and CCIS1301) **(EP) 3 cr**

CCIS1351 ADVANCED HTML USING XHTML
This course will provide an in-depth exposure to writing HTML code and creating advanced web pages. The student will learn to write web pages of advanced complexity: nested tables, frames, forms and CGI's. (Prereq: CCIS1301) **(BP/EP) 4 cr**

CCIS1370 MACROMEDIA POWER TOOLS
This course gives students an introduction to the use of Macromedia applications for developing and maintaining Web sites. The Macromedia Applications include FreeHand, Fireworks, Flash and Dreamweaver. The latest version of Macromedia MX 2004 is used. Skills are mastered via hands-on exercises and examples. (Prereq: CCIS1101 and CCIS1301) **(EP) 4 cr**

CCIS1410 CCNA-1: NETWORKING BASIC
This is the first of four "Cisco Academy" courses that will prepare students to take and pass the Cisco Certified Network Associate (CCNA) test. Topics covered include the following: network topologies, protocols, standards & regulations, transmission media & speed, and network design & hardware. TCP/IP concepts will be introduced & explained.

** Completion of CCIS1410, 1421, 1431 and 1441 will qualify as a substitution for CCIS1201 Data COMMUNICATIONS & Network Design and CCIS2221 Network Configuration. (Prereq: None) **(EP) 3 cr**

CCIS1421 CCNA-2: ROUTERS & ROUTING BASICS
This is the second of four "Cisco Academy" courses that will prepare students to take and pass the Cisco Certified Network Associate (CCNA) test. Topics covered include the following: router configuration, routed protocols, RIP, IGRP, VLSM, and access-lists.

** Completion of CCIS1410, 1421, 1431 and 1441 will qualify as a substitution for CCIS1201 Data COMMUNICATIONS & Network Design and CCIS2221 Network Configuration. (Prereq: CCIS1410 or CCIS1201 or CCIS1210) **(EP) 4 cr**

CCIS1431 CCNA-3: SWITCHING BASICS & INTERMEDIATE ROUTING
This is the third of four "Cisco Academy" courses that will prepare students to take and pass the Cisco Certified Network Associate (CCNA) test. Topics covered include the following: advanced router configurations, OSPF, EIGRP, LAN switching theory and VLANs, Spanning-Tree, and switched-LAN design.

** Completion of CCIS1410, 1421, 1431, and 1441 will qualify as a substitution for CCIS1201 Data COMMUNICATIONS & Network Design and CCIS2221 Network Configuration. (Prereq: CCIS1421) **(EP) 4 cr**

CCIS1441 CCNA-4: WAN TECHNOLOGIES
This is the fourth of four "Cisco Academy" courses that will prepare students to take and pass the Cisco Certified Network Associate (CCNA) test. Topics covered include the following: WAN theory and design, WAN technology (PPP, Frame Relay, ISDN), NAT, DDR, DHCP, network troubleshooting and emerging technologies.

** Completion of CCIS1410, 1421, 1431 and 1441 will qualify as a substitution for CCIS1201 Data COMMUNICATIONS & Network Design and CCIS2221 Network Configuration. (Prereq: CCIS1431) **(EP) 4 cr**

CCIS1450 CCNP-1: ADVANCED ROUTING
Instruction includes, but is not limited to: Scalable Internetworks, Managing Traffic and Access, Managing IP Traffic, Configuring Queuing to Manage Traffic, Routing Protocols. Extending IP Addresses using VLSM, Configuring OSPF in a Single Area, Interconnecting Multiple OSPF Areas, Configuring Enhanced IGRP, Optimizing Routing Update Operation, Configuring BGP, configuring IS-IS, and Implementing Quality of Service. (Prereq: CCIS1441) **(EP) 4 cr**

CCIS1455 CCNP-2: REMOTE ACCESS

Instruction includes, but is not limited to: Selecting Equipment Products for Remote Connections, Assembling and Cabling the WAN Components, Configuring Asynchronous Connections with Modems, Accessing the Central Site with Windows 9x/2000/XP, Configuring PPP and Controlling Network Access with PAP or CHAP, Using ISDN and DDR to Enhance Remote Connectivity, Optimizing Use of DDR Interfaces, Configuring a 700 Series Router, Establishing a Dedicated Frame Relay Connection and Controlling Traffic Flow with Traffic Shaping, Enabling a Backup to the Permanent Connection, Optimizing Traffic on Dedicated WAN Connections, Scaling IP Addresses with PAT and NAT, Troubleshooting the Remote Access Network. (Prereq: CCIS1450) **(EP) 4 cr**

CCIS1470 NETWORK SECURITY-1: (IOS FIREWALLS & VPN'S)

This course will provide a comprehensive overview of network security solutions utilizing routers as a "firewall". Instruction will include authentication methods, common network attacks and how to safeguard against them, communication security (remote access, e-mail, the web, directory and file transfer, and wireless data), infrastructure security (network devices and media, and the proper use of perimeter topologies such as DMZs, Extranets, and Intranets to establish network security). Cryptography basics are provided, including the differences between asymmetric and symmetric algorithms, and the different types of PKI certificates and their usage. Operational/organizational security is discussed as it relates to physical security, and disaster recovery. (Prereq: CCIS1431 or instructor approval) **(EP) 4 cr**

CCIS1475 NETWORK SECURITY-2: (PIX FIREWALLS & VPN'S)

This course will provide further examination of the concepts introduced in Network Security-1, and will expose students to security solutions utilizing "PIX boxes" (firewalls). Instruction will include authentication methods, common network attacks and how to safeguard against them, communication security (remote access, email, the web, directory and file transfer, and wireless data), infrastructure security (network devices and media, and the proper use of perimeter topologies such as DMZs, Extranets, and Intranets to establish network security). Cryptography basics are provided, including the differences between asymmetric and symmetric algorithms, and the different types of PKI certificates and their usage. Operational/organizational security is discussed as it relates to physical security, and disaster recovery. (Prereq: CCIS1431) **(EP) 4 cr**

CCIS1505 FUNDAMENTALS OF PROGRAMMING

This course is intended as the first course for a student planning to study computer programming. The course content will introduce the student to both procedure-oriented and object-oriented programming languages. Structured programs will be written with a computer programming language with an emphasis on procedure-oriented programming. Topics will include UML (Unified Modeling Language), objects, classes, methods, properties, flowcharting, pseudocode, top down design, logic structures, data types, decisions, subroutines, looping and arrays. (Prereq: MATH1000 or sufficient math assessment test scores and Microsoft Windows experience) **(BP/EP) 4 cr**

CCIS1515 WEB PROGRAMMING OVERVIEW

This course is intended for students who need to get an overview of programming, but are not planning to become computer programmers. The objective is to cover basic programming principles, especially web programming. Modern object-oriented programming will be explained, as well as the various tools available for programming web sites. It will also cover how this function relates to other functions in an organization, especially the web development function. (Prereq: CPLT1100) **(BP) 3 cr**

CCIS1570 C LANGUAGE FAMILY I

This course covers the C and C++ programming languages. Topics include syntax, data types, operators, expressions and statements, functions, arrays, pointers, and structures. Upon completion of this course the student will be able to read C code and program in C language. (Prereq: CCIS1505 or one year previous programming experience) **(EP) 4 cr**

CCIS1715 IMPLEMENTING M/S WINDOWS 2000 PROFESSIONAL

This course provides students with the knowledge and skills necessary to install and configure Microsoft Windows 2000 Professional on stand-alone and client computers that are part of a workgroup or domain. In addition, the intention of this course is to provide students with the prerequisite knowledge and skills required for taking Implementing Microsoft Windows 2000 Server and to help the students prepare for the Microsoft Certification Exams 70-210 and 70-215. (Prereq: CCIS1101. CCIS1201 and CCIS1210 or concurrent) **(BP) 3 cr**

CCIS1720 IMPLEMENTING M/S WINDOWS 2000 SERVER

This course provides the skills and knowledge necessary to install and configure Windows 2000 Server to create file, print, Web, and Terminal servers. It also provides students with the prerequisite knowledge and skills required for taking Managing Microsoft Windows 2000 Network Environment and to help the students prepare for the Microsoft Certification Exams 70-210 and 70-215. (Prereq: CCIS1110 or CCIS1715 or instructor approval) **(BP) 4 cr**

CCIS1725 MANAGING M/S WINDOWS 2000 NETWORK ENVIRONMENT

This course is intended to provide the knowledge required by system administrators, network administrators, and IT professionals who implement, manage, and troubleshoot existing network and server environments based on the Microsoft® Windows® 2000 operating system.

These skills are generally required in medium to large organizations that maintain 200 to 26,000 user desktops and servers, spanning two to 100 physical locations by using local area networks (LANs) and the Internet or intranets. Additionally, this course provides the prerequisite knowledge and skills required for taking Implementing a Microsoft Windows 2000 Network Infrastructure and for helping students prepare for Microsoft Certified Professional Exam 70-218. (Prereq: CCIS1720 or CCIS2150) **(BP) 4 cr**

CCIS1730 IMPLEMENTING AN M/S WINDOWS 2000 NETWORK INFRASTRUCTURE

This course is intended to provide the knowledge required for support professionals who will be responsible for installing, configuring, managing, and supporting a network infrastructure that uses the Microsoft Windows 2000 Server products. It also provides students with the prerequisite knowledge and skills to assist students in preparation for Microsoft Certified Professional Exam 70-216 as well as Microsoft Certification Course 2154, Implementing and Administering Microsoft Windows 2000 Directory Services. (Prereq: CCIS1725) **(BP) 4 cr**

CCIS2005 C# AND THE MICROSOFT .NET FRAMEWORK

This is an introduction course to Microsoft's C# programming language and the .NET Framework. Students will learn the fundamentals of the C# programming language, write objected-oriented programs, write Windows Applications and write programs to access databases. Students will also learn the .NET framework. (Prereq: CCIS1570 or CCIS2595) **(EP) 4 cr**

CCIS2021 ADVANCED EXCEL

This course will focus on advanced techniques in spreadsheet design, functions, macros, graphs and reports. (Prereq: ACCT1125) **(BP) 4 cr**

CCIS2031 ADVANCED ACCESS

This course is designed to give the student knowledge about advanced Access concepts and features and how these features can be used in business situations. Students will implement the features in case studies that focus on important types of business use for databases. Macros and advanced queries will be emphasized. (Prereq: CCIS1031) **(BP/EP) 4 cr**

CCIS2035 ACCESS FOR DEVELOPERS

This course is designed to give the student knowledge about advanced Access concepts and features and how these features can be used in business situations. Focusing on the programming capabilities of Microsoft Access, this course offers in-depth interactive training for developers. (Prereq: CCIS1031 and CCIS2550) **(EP) 4 cr**

CCIS2040 WIRELESS APPLICATION DEVELOPMENT

In this course, we will take an in-depth look at wireless Internet application development. We will examine wireless communications and then focus on the language and techniques used to develop applications that can be accessed by mobile wireless devices. (Prereq: CCIS1351 and CCIS2651) **(BP) 4 cr**

CCIS2051 MS OFFICE INTEGRATION/OUTLOOK

The student will learn to share text, data and graphics among the Microsoft office programs: Word, Excel, Access and PowerPoint. Outlook is an integrated e-mail, calendar, and task management program and will be used to efficiently communicate with others. (Prereq: CCIS1101 plus two of the following: Word, Excel, Access, PowerPoint) **(BP) 4 cr**

CCIS2055 MS PROJECT

This course will teach students project management skills utilizing Microsoft Project 2002 using a case-oriented problem-solving approach. Content covers the basic to intermediate Project 2002 skills to include planning a project, creating schedules, communication of information, assigning resources and costs, tracking progress, and closing a project. (Prereq: CCIS1000 and CCIS1101) **(BP) 3 cr**

CCIS2061 HELP DESK/USER SUPPORT

This course is designed to introduce students to the concepts and practices required of an entry-level technology professional in an effort to prepare them to become technical service providers. (Prereq: CCIS1000, CCIS1101 and CCIS1210) **(BP) 3 cr**

CCIS2122 LINUX ADMINISTRATION II

The second course in the Unix operating system builds upon Linux ADMINISTRATION I, by introducing networking and security. This course will prepare the student for using Unix/Linux as an all-purpose server, for example, web, email (using several popular email servers), Windows file and printer sharing, as a firewall/router and as a DNS server. Encryption and data security will also be covered. Tripwire and advanced security will be introduced. Knowledge of shell scripts and the vi editor is required. (Prereq: CCIS1121 and CCIS1201) **(BP/EP) 4 cr**

CCIS2125 INTRUSION DETECTION AND RESPONSE

This optional computer course will examine the technology and process of detecting misuse of computer systems, as well as, the methodology of response and investigation. Key features include discussion of static and dynamic auditing tools, intrusion detection systems, authentication and tracking methods, law enforcement questions, international issues, and the technology of hardening systems against misuse. Linux, Unix, Windows 2000, Windows NT and Windows XP will all be covered. Students will receive hands-on experience with intrusion detection systems and a variety of security tools, as well as have exposure to the theories behind those tools. (Prereq: CCIS1110, CCIS1121, CCIS2122 and CCIS2150) **(BP) 4 cr**

CCIS2150 WINDOWS ADMINISTRATION II
This is the second of two courses in network administration using Microsoft 2000 Server Operating System. This course will use Microsoft WindowsNT Workstation, Microsoft Windows 2000 Professional and Windows98 client's machines in conjunction with Windows 2000 Server machines in several client-server configurations. Topics will cover working in active directory environments as well as incorporating older domain structures. Lab work will include configuring server machines to handle printing, user account management, security management, and other network resources such as the Internet, accessing other serves, IP-address management, and DNS services. (Prereq: CCIS1110 or instructor approval) **(BP/EP) 4 cr**

CCIS2160 LINUX ADMINISTRATION III
The third and optional course in the Unix operating system builds upon Linux II, by introducing more advanced topics. Topics explored include the WINE package, CVS, Advanced Shell Scripting, OpenSSH, encryption and advanced security topics. (Prereq: CCIS1121 and CCIS2122) **(BP/EP) 4 cr**

CCIS2221 NETWORK CONFIGURATION
This course will provide a practical knowledge of network concepts & hardware configuration. The course will review the concepts introduced in CCIS1201 (Data Communication & Network Design), and will give students the opportunity to set up and troubleshoot a local area network. Topics covered will include the following: selection & installing network cabling, configuring workstations, routing, implementing Internet access, and configuring basic firewalls. (Prereq: CCIS2122 or CCIS2150) **(BP/EP) 4 cr**

CCIS2240 NOVELL ADMINISTRATION
This course will cover many typical administrative tasks of administering a Novell network, including the following: accessing network servers & printers, designing an NDS structure, adding & managing user accounts, implementing security, installing client software, writing login-scripts, configuring network-based applications, installing client software, writing login-scripts, configuring network-based applications, installing Netware servers and printers, partitioning and merging NDS structures, implementing network printing, and optimizing server & network performance. (Prereq: CCIS1101. CCIS1201 and CCIS1210 or concurrent) **(BP/EP) 4 cr**

CCIS2250 WEB EXPERIENCE
This is a "capstone" experience taken during the last semester where WEB Programming students will be required to work in teams to produce web sites. We may ask industry to review the work on the Internet to evaluate their skills. (Prereq: Instructor approval) **(BP) 4 cr**

CCIS2255 WEB PORTFOLIO I
This is a course taken in the first or second semester where WEB Programming students begin to collect their projects from various classes. (Prereq: Instructor approval) **(BP) 1 cr**

CCIS2256 WEB PORTFOLIO II
This is a course taken in the last semester where WEB Programming students assemble and present their projects from various classes. The portfolio can serve as evidence of acquired skills when seeking employment. (Prereq: Instructor approval) **(BP) 1 cr**

CCIS2270 WINDOWS ADMINISTRATION III: IIS AND EXCHANGE
This course will provide students with hands-on experience in setting up and administering e-mail, web, ftp, and other "Internet services" using Microsoft's Internet Information Server and Exchange Server. Proxy-servers, network address translation (NAT), and packet filters will be implemented to implement secure (firewalled) websites. (Prereq: CCIS2150) **(BP/EP) 4 cr**

CCIS2311 WEB PROGRAMMER INTERNSHIP
This is a cooperative program between Hennepin Technical College and a participating company to allow the student an employment-like work experience. (Prereq: Instructor approval) **(BP) 2-8 cr**

CCIS2320 HELP DESK INTERNSHIP I
This is a cooperative program between Hennepin Technical College and a participating company to allow the student an employment-like work experience. (Prereq: Instructor approval) **(BP) 6 cr**

CCIS2330 HELP DESK INTERNSHIP II
This is the second part of a cooperative program between Hennepin Technical College and a participating company to allow the student an employment-like work experience. (Prereq: Instructor approval) **(BP) 6 cr**

CCIS2340 COMPUTER PROGRAMMER INTERNSHIP I
This is a cooperative program between Hennepin Technical College and a participating company to allow the student an employment-like work experience. (Prereq: Instructor approval) **(EP) 2-8 cr**

CCIS2350 COMPUTER PROGRAMMER INTERNSHIP II
This is the second part of a cooperative program between Hennepin Technical College and a participating company to allow the student an employment-like work experience. (Prereq: Instructor approval) **(EP) 2-8 cr**

CCIS2360 PC SUPPORT INTERNSHIP I
This is a cooperative program between Hennepin Technical College and a participating company to allow the student an employment-like work experience. (Prereq: Instructor approval) **(BP) 2-8 cr**

CCIS2370 PC SUPPORT INTERNSHIP II
This is the second part of a cooperative program between Hennepin Technical College and a participating company to allow the student an employment-like work experience. (Prereq: Instructor approval) **(BP) 2-8 cr**

CCIS2380 NETWORK SUPPORT INTERNSHIP I
This is a cooperative program between Hennepin Technical College and a participating company to allow the student an employment-like work experience. (Prereq: Instructor approval) **(BP/EP) 2-8 cr**

CCIS2390 NETWORK SUPPORT INTERNSHIP II
This is the second part of a cooperative program between Hennepin Technical College and a participating company to allow the student an employment-like work experience. (Prereq: Instructor approval) **(BP/EP) 2-8 cr**

CCIS2550 VISUAL BASIC I
The students who take this course will learn to create basic applications using Visual Basic .NET. This will include using and programming forms, controls, events, methods, procedures and functions. The student will also learn how to use Visual Basic to create and manipulate database files. (Prereq: CCIS1101 and CCIS1505) **(EP) 4 cr**

CCIS2560 VISUAL BASIC II
This course will be a continuation of Visual Basic I also using the .NET framework. Emphasis in this course will be on ASP.NET, ADO.NET and dialog controls. Upon completion of this course, the student will be able to program complete Visual Basic applications using a variety of advanced techniques. (Prereq: CCIS2550) **(EP) 4 cr**

CCIS2565 MIGRATING TO VISUAL BASIC .NET
This course is designed for students who are already proficient in programming Visual Basic in versions prior to VB .NET, and have a good understanding of object-oriented programming and structured programming techniques. The students who take this course will learn to create basic applications using Visual Basic .NET. This will include using and programming forms, controls, events, methods, procedures and functions. The student will also learn how to use Visual Basic to create and manipulate database files. (Prereq: CCIS2560 or instructor approval) **(EP) 2 cr**

CCIS2570 C LANGUAGE FAMILY II
This course covers the C++ programming language. Topics include introduction to graphical user interface programming, pointers, reference, structures, classes and objects, overloading, inheritance, and templates. Upon completion of this course the student will be able to read C++ code and program in C++ language. (Prereq: CCIS1570) **(EP) 4 cr**

CCIS2580 C LANGUAGE FAMILY III
This course is designed to introduce the student to GUI and Windows programming using Visual C++. Students will be using an industry current development environment and class library. Object oriented programming techniques will be reviewed and expanded. Topics include class library usage and the Windows API, GUI program elements, and user interface development. (Prereq: CCIS2570) **(EP) 4 cr**

CCIS2591 JAVASCRIPT
This course is an introduction to scripting Web pages in JavaScript with emphasis on good coding practices. Topics include: core JavaScript (syntax, basics, variables, functions), DOM (Document Object Model), object hierarchy, events, regular expressions, strings, cookies, windows, forms, and related objects. (Prereq: CCIS1301 and programming experience) **(BP/EP) 4 cr**

CCIS2595 JAVA I
This course is an introduction to programming in Java. Topics include fundamentals of Java programming, including object-oriented programming, primitive data types, control structures, methods, objects, classes, class inheritance, simple graphical user interface and event-driven programs, using Swing. Object-oriented design using the Unified Modeling Language will also be introduced. (Prereq: CCIS1505, CCIS1101 and any procedural programming language) **(BP/EP) 4 cr**

CCIS2601 A+ HARDWARE/SOFTWARE SUPPORT
This advanced course will provide a practical knowledge of issues and solutions available when providing "technical support" to computer users. Students will acquire many of the skills necessary for "A+" certification, including needs analysis, installation and configuration of hardware and software, troubleshooting, and preventative maintenance. (Prereq: CCIS1000, CCIS1101, and CCIS1210 and at least one of the following applications: ACCT1125, CCIS1031, CCIS1035, CCIS1041 or CCIS1080) **(BP) 4 cr**

CCIS2610 XML I
This course will provide students a thorough grasp of the basics of XML. The class will emphasize hands-on instruction and practical usage of XML. This course is for the beginning XML person. It assumes some knowledge of web pages in HTML. (Prereq: CCIS2591) **(EP) 4 cr**

CCIS2615 XML II
This is a second course in XML, following XML I. Topics include advanced core XML, XLink, and XPath; XQuery; XSL; XForms; XML signatures; parsing; using XML and XSLT with Java; SOAP; and Web Services. (Prereq: CCIS2595, CCIS2610 and CCIS2701 or equivalent) **(BP/EP) 4 cr**

CCIS2630 PHP
A course designed for students who want to build dynamic web sites using the PHP programming language. Since PHP is such a rich and task-specific language, the course covers in depth the most important range of functions and equips delegates to understand the remaining less essential aspects. (Prereq: CCIS1351 and programming experience)
(BP/EP) 4 cr

CCIS2640 PERL/CGI
This course will cover the PERL scripting language, how to develop PERL code for web applications, and client/server socket programming using PERL. (Prereq: CCIS1301, CCIS1351 and programming experience) **(BP/EP) 4 cr**

CCIS2645 INTRODUCTION TO ASP.NET
This course is a basic introduction to Microsoft's .NET Active Server Pages (ASP) technology for students who have a solid fundamental understanding of static web page development. The course will include the implementation of web pages with the Microsoft .NET framework using Visual Studio .NET using either the C# or VB.NET programming language. Using these tools students will learn how to develop web pages to create dynamic documents including retrieving data from SQL databases such as Microsoft SQL Server. (Prereq: CCIS 1301 and CCIS 2005 or CCIS 2560) **(EP) 4 cr**

CCIS2651 JAVA II
This course is a continuation of Java I, and prepares students to develop real-world projects using Java. Students will be able to apply the object-oriented approach to develop applications and applets with graphics, exception handling, internationalization, multithreading, multimedia, I/O, and networking. Object-oriented design topics include the need for design, object-oriented design, design of classes and objects, object relationships, design patterns, and the Unified Modeling Language. (Prereq: CCIS2595) **(BP) 4 cr**

CCIS2662 JAVA SERVER PAGES (JSP)
This course is designed to help students prepare for a career in e-commerce development. JSP is part of the Java technology family. This technology can be used to develop and maintain dynamic, substantive Web pages that are platform independent and that utilize or interact with other resources, such as the Java API and databases. It makes it possible to separate the user interface from the business logic by means of XML-like tags. (Prereq: CCIS1351, CCIS2651 and CCIS2701) **(BP) 4 cr**

CCIS2670 ENTERPRISE JAVA BEANS
This course is designed to help students prepare for a career in e-commerce development. Enterprise Java Beans are part of the Java technology family and are useful for managing distributed objects. The EJB architecture provides a framework in which the developer can easily take advantage of transaction processing, security, persistence, and resource-pooling facilities. (Prereq: CCIS1351, CCIS2651 and CCIS2701) **(BP) 4 cr**

CCIS2701 DATABASE DESIGN AND SQL
This course covers relational databases and the efficient design of these databases. The course will include the definition of tables and indexes, logical and physical design, the E-R model, and transaction management. The use of Structured Query Language (SQL) will be emphasized. (Prereq: CCIS1000, CCIS1101 and one semester in a procedural programming language) **(BP/EP) 4 cr**

CCIS2751 INTRODUCTION TO ORACLE
This course offers students an extensive introduction to data server technology. The class covers the concepts of relational databases and the powerful SQL and PL/SQL programming languages. Students are taught to create and maintain database objects and to store, retrieve, and manipulate data. (Prereq: CCIS2701) **(EP) 4 cr**

CCIS2761 ORACLE APPLICATION DEVELOPMENT
Learn about Oracle's rapid application development tool for interactive Internet applications, featuring rich, desktop-style, user interfaces. Create a single forms module and deploy it on the web or client/server with no changes to the module. This is the development tool used by Oracle Applications. Learn how to implement it within your enterprise. (Prereq: CCIS2751) **(EP) 4 cr**

CCIS2772 ORACLE DATABASE ADMINISTRATION I
This course is designed to give the Oracle database administrator (DBA) a firm foundation in basic administrative tasks. The primary goal of this course is to give the DBA the necessary knowledge and skills to set up, maintain, and troubleshoot an Oracle database. This course has been designed for junior database administrators, technical support analysts, system administrators, application developers, MIS managers, and other Oracle users. (Prereq: CCIS2751) **(EP) 4 cr**

CCIS2776 ORACLE DATABASE ADMINISTRATION II
This course gives the Oracle database administrator (DBA) a firm foundation in Oracle Net administration and backup and recovery operations. Students learn about transporting data between databases and the utilities used to perform these activities. Students are also introduced to networking concepts and configuration parameters, as well as how to solve some common network problems. This course also addresses backup and recovery techniques, and examines various backup, failure, restore and recovery scenarios. Students also examine backup methodologies based on business requirements in a mission critical enterprise. Students use multiple strategies and Oracle Recovery Manager to perform backups, and restore and recovery operations. (Prereq: CCIS2772) **(EP) 4 cr**

CCIS2781 SQL SERVER - TRANSACTSQL
This course provides students with the technical skills required to utilize TransactSQL programming solutions within a Microsoft SQL Server client/server database management system. (Prereq: CCIS1031and CCIS2701) **(EP) 4 cr**

CCIS2786 SQL SERVER - SYSTEM ADMINISTRATION
This course provides students with the knowledge and skills required to install, configure, administer, and troubleshoot Microsoft SQL Server client/server database management system. (Prereq: CCIS1031) **(EP) 4 cr**

Course Descriptions

CCIS2801 SYSTEMS ANALYSIS

This course presents a practical approach to systems analysis and design using a blend of traditional development methodologies with current technologies. Students will gain an understanding of the activities involved in the Systems Development Life Cycle, covering the planning, analysis design, implementation, and support phases. The course will focus on real-world business systems and will help students to understand how information technology supports operational and business requirements in today's fast-changing technology environment. (Prereq: One year programming experience) **(BP/EP) 4 cr**

CCIS2841 CLIENT/SERVER THEORY

This course covers the evolution, impact and services available with Client/Server technology. The characteristics of clients and servers and the role of middleware will be discussed. Students will explore the various type of Client/Server implementations: SQL databases, transaction servers, distributed objects, groupware, Web applications and JAVA. (Prereq: CCIS1000 and one semester of any programming language) **(BP/EP) 4 cr**

CHLD1100 CHILD CARE AS A PROFESSION

In this course the student will learn about the child care profession and the role as a caregiver. Observational visits to different types of child care programs will be required. The students will have an opportunity to increase their cultural sensitivity by gaining accurate information about diverse cultures and learn strategies to eliminate the problems of labeling and stereotyping culturally diverse families. Curriculum areas such as art, literature and science will be introduced. (Prereq: None) **(BP/EP) 2 cr**

CHLD1125 GUIDING CHILDREN'S BEHAVIOR

The student will learn effective techniques for guiding children's behavior by participating in group discussions, role playing, brainstorming and more! Learn to implement positive guidance techniques such as limit setting, verbal guidance, indirect guidance and behavior modification. (Prereq: None) **(BP/EP) 3 cr**

CHLD1150 LITERATURE AND LANGUAGE FOR CHILDREN

The student will learn how to present literature and language activities by exploring children's books, poetry and story-telling techniques. Also covered will be exploring activities that promote language development and help children learn about themselves and their family, friends and community. The student will discover activities and materials that encourage an appreciation of diversity. (Prereq: None) **(BP/EP) 3 cr**

CHLD1175 CREATIVE ACTIVITIES

The student will learn ways of planning and guiding creative activities including various types of art and small motor activities. These will include ideas for painting, playdough, collage, cutting and using table toys. (Prereq: None) **(BP/EP) 2 cr**

CHLD1500 CHILD GROWTH AND DEVELOPMENT

The student will study basic growth and development of children from conception through the school-age years. Activities, materials and caregiving techniques will be explored for each age group. The impact of television on children will be discussed. By developing an understanding of basic growth and development, the student will be better able to work with children and plan developmentally appropriate activities for them. (Prereq: None) **(BP/EP) 3 cr**

CHLD1525 HEALTH, SAFETY AND NUTRITION

The student will learn ways to keep children safe and healthy. Topics include preventing illness and accidents, handling emergencies, child abuse and other current health-related issues. Also covered will be how to plan and supervise nutritious meals and snacks and discover effective techniques for supervising other daily routines. (Prereq: None) **(BP/EP) 2 cr**

CHLD1550 COGNITIVE ACTIVITIES

The student will discover the how, what and why of involving children in problem solving by exploring math, science and sensory activities. Use walks and field trips to further explore cognitive concepts. (Prereq: None) **(BP/EP) 2 cr**

CHLD1575 MUSIC AND MOVEMENT ACTIVITIES

The student will use music and movement to encourage self expression in children. Participate in music activities such as rhythm and movement, drama activities such as puppetry and story dramatization and age appropriate movement activities. (Prereq: None) **(BP/EP) 2 cr**

CHLD1700 PRACTICUM - LAB PRESCHOOL

The student will gain experience working with preschool children in the high quality Lab Preschool program at Hennepin Technical College. The student will assist the head teacher in handling all aspects of the program, including planning and presenting developmentally appropriate activities. The students will head-teach for one week. A daily journal of the experiences will be kept. (Prereq: Instructor approval) **(BP/EP) 3 cr**

CHLD1725 PRACTICUM - SPECIAL NEEDS

The student will gain hands-on experience working with special needs children. Also covered will be exploring different learning styles, categories of special needs, adaptive equipment and use of this information in caring for children, assisting the head teacher in handling all aspects of the program and planning and presenting developmentally appropriate activities. A daily journal of the experiences will be kept. (Prereq: None) **(BP/EP) 3 cr**

CHLD1750 PRACTICUM - CHOICE
The student will gain hands-on experience working with children. The practicum will be assigned at one of the program types, which include infant-toddler, preschool, school-age, in-home care, and elementary school. The student will also assist the head teacher in handling all aspects of the program and will plan and present developmentally appropriate activities. A daily journal of the experiences will be kept. (Prereq: None) **(BP/EP) 3 cr**

CHLD2000 INTEGRATING CHILDREN WITH SPECIAL NEEDS
The student will recognize the needs and differences of children and the importance of treating each child as an individual. The student will observe and assess children's development using a variety of methods and study types of special needs and strategies for working effectively with these children. (Prereq: None) **(BP/EP) 3 cr**

CHLD2026 PROFESSIONAL LEADERSHIP
The student will discuss reasons for becoming a teacher, ways to advocate in this profession and will develop a plan for continuous education and professional development. The student will join a professional organization and attend a professional conference. The student will improve skills in working with others by learning strategies for team-building, coping with stress and problem solving. The student will study professional ethics and procedures for evaluating staff. (Prereq: Student must have completed 12 credits in Child Development) **(BP/EP) 3 cr**

CHLD2050 SUPPORTING CHILDREN'S PLAY
The student will study children's play problems and identify strategies to prevent and resolve problem behaviors in the child care setting using peers, the teacher and the environment. The student will discover how temperament affects behavior. (Prereq: None) **(BP/EP) 2 cr**

CHLD2075 FAMILY AND COMMUNITY ISSUES
The student will learn how to work with a variety of families including blended and adoptive families. The student will examine the importance of the family/school relationship, study methods of effectively communicating with parents and study community organizations and networks to support families. (Prereq: None) **(BP/EP) 3 cr**

CHLD2100 CHILD ABUSE AND NEGLECT
The student will identify categories of abuse and neglect and the procedure for reporting, and study methods of working with high-risk families. (Prereq: None) **(BP/EP) 2 cr**

CHLD2126 CARING FOR INFANTS AND TODDLERS
The student will study caregiving methods for infants and toddlers in either home or center-based settings. The student will learn to organize and evaluate infant/toddler programs. Activities and materials that nurture children's development will be explored. (Prereq: None) **(BP/EP) 3 cr**

CHLD2226 CARING FOR PRESCHOOL CHILDREN
The student will study caregiving methods for preschool children in either home or center-based settings. Activities and materials that nurture children's development will be explored. The student will describe characteristics of a developmentally appropriate program as well as plan preschool curriculum. (Prereq: None) **(BP/EP) 3 cr**

CHLD2251 CARING FOR SCHOOL-AGE CHILDREN
The student will study caregiving methods for school-age children in either home or center-based settings. The student will identify components of a developmentally appropriate program. Activities and materials that nurture children's development will be explored. The student will also learn new teaching strategies that are effective with school-age children. (Prereq: None) **(BP/EP) 3 cr**

CHLD2301 CURRICULUM PLANNING FOR THE WHOLE CHILD
Students will identify and adapt developmentally appropriate practice to a curriculum model and will plan an age/stage appropriate curriculum weekly unit. This course will also help students assess and plan how to meet the developmental needs of the whole child through play. (Prereq: None) **(BP/EP) 1 cr**

CHLD2325 STORYTELLING PROPS
Make your stories come to life! Use materials that you may already own to create props for both you and your children. Be ready for active participation. (Prereq: None) **(BP/EP) 1 cr**

CHLD2525 ADVANCED COGNITIVE ACTIVITIES
The student will review developmental theory in practice and expand on problem-solving abilities to adapt cognitive concepts in the classroom. Applying math and science concepts, the student will prepare lesson plans, create activities, and explore ways to implement cognitive learning in the classroom environment. (Prereq: None) **(BP/EP) 1 cr**

COMM1005 EFFECTIVE STUDY SKILLS
This course focuses on the learning skills necessary to master the training program in which the student is/will be enrolled. This includes time management, textbook reading, listening, notetaking skills and test taking. (Prereq: None) **(BP/EP) 1 cr**

COMM1016 TEAMBUILDING IN THE WORKPLACE
Teamwork is an essential part of the workplace today and will increase in the future. This course will improve student's understanding of both theory and practical application of skills used in small groups. Students will participate in groups, completing group projects and analyzing group interaction. Emphasis will be on group formation and development, effective leadership, decision making in groups, active participation, conflict resolution, planning and conducting meetings. (Prereq: None) **(BP/EP) 2 cr**

COMM1040 JOB SEEKING SKILLS
Finding a job is one of the most difficult tasks we ever face. Research shows people may change careers from three to nine times during their working lifetime. Students will learn the skills necessary to explore the job market, create a saleable resume and application letter, and present one's self effectively in an interview. (Prereq: None) **(BP/EP) 2 cr**

COMM1050 COMMUNICATION IN THE WORKPLACE
This course focuses on the concepts of human communication and the styles of communications used in personal, social and professional environments. Students will learn the characteristics and process of interpersonal communication including perception, speech and language, non-verbal behaviors, listening and feedback, the ethics of interpersonal communication and relationship development and maintenance. (Prereq: None) **(BP/EP) 2 cr**

COMM1060 CAREER PORTFOLIO
This is a combination lecture and workshop class that results in the compilation of a portfolio. The portfolio consists of a resume, cover letter, reflective self-analysis essay, and a collection of paper and/or electronic artifacts ready for display to possible employers. (Prereq: Qualifying score on CPT English assessment test OR ENGL0910) **(BP/EP) 3 cr**

COMM1100 AMERICAN SIGN LANGUAGE, DEAF CULTURE I
This course is designed to introduce students to American Sign Language and the Culture of Deaf People in the United States. (Prereq: None) **(BP/EP) 2 cr**

COMM1110 AMERICAN SIGN LANGUAGE, DEAF CULTURE II
This course is designed to increase the students sign vocabulary and knowledge of the rules of ASL grammar. (Prereq: COMMUNICATIONS1100 or instructor approval) **(BP/EP) 2 cr**

COMM1130 CUSTOMER SERVICE IN THE WORKPLACE
Ours is increasingly becoming a service economy. Therefore, it follows that the premiere skill is customer service. This skill transcends all occupational areas and defines the success of all business. This course describes what customer service is, the skills necessary to achieve it, the rationale for adding value to the experience and person to person skills needed to achieve excellence in serving the customer. (Prereq: None) **(BP/EP) 3 cr**

COMM2020 INTERCULTURAL COMMUNICATION; LEARNING THROUGH SERVING
This course provides training in understanding the importance of intercultural communication and theories. Topics covered include: definitions of communication; definitions of culture and diversity of cultural patterns; cultural variables influencing communication, such as language, non-verbal behavior, perception, values, and beliefs; factors that facilitate or inhibit intercultural communication; and examination of American culture in comparison to other cultures. This course offers the opportunity for students to travel and experience an alternative culture. Travel fees will be charged in addition to tuition fees. The travel location will vary according to the service learning project selected. (Prereq: None) **(BP/EP) 3 cr**

COMM2050 INTERPERSONAL COMMUNICATION
This course focuses on the practical and theoretical concepts of human communication and the styles of communication used in academic, social and professional environments. Students will learn the characteristics and process of interpersonal communication including perception, speech and language, non-verbal behaviors, listening and feedback, conflict recognition and resolution, small group dynamics, the ethics of interpersonal communication and relationship development and maintenance. In this course you will learn to communicate more effectively in all settings. (Prereq: Qualifying score on CPT reading assessment test OR ENGL0920) **(BP/EP) 3 cr**

COMM2060 SMALL GROUP COMMUNICATION
This course focuses on the theoretical and practical application of skills used in a small group setting. Students will participate in groups, completing group projects and analyzing group interaction. Emphasis will be on group formation and development, effective leadership, decision making in groups, active participation, conflict resolution, planning and conducting meetings. Gathering information, argumentation and preparing agendas and minutes will also be practiced. (Prereq: Qualifying score on CPT reading assessment test OR ENGL0920) **(BP/EP) 3 cr**

COMM2130 PUBLIC SPEAKING
In this course, students will learn organization, preparation, and delivery skills to become effective communicators in both individual and group presentations. Emphasis will be on audience analysis, research and organization, speech construction, and delivery techniques. Listening and evaluation skills will also be practiced. (Prereq: Qualifying score on CPT reading assessment test OR ENGL0920) **(BP/EP) 3 cr**

CPLT1000 COMPUTER KEYBOARDING
This course involves the development of basic keyboarding techniques and skills using a computer. Emphasis will be on learning the "touch" method of typing the alphabetic keys and the numeric keypad. The keyboarding goal will be the attainment of a minimum rate of 20 net words per minute on alphabetic copy. (Net words per minute is determined by subtracting 2 for each error from the gross words per minute.) It may be necessary to have access to a computer outside of class in order to complete the assignments. A student computer lab is available on each campus. (Prereq: None) **(BP/EP) 2 cr**

CPLT1005 SKILL BUILDING AND DOCUMENT PROCESSING

Students will improve alphabetic, numeric and symbol keyboarding techniques and skills using a computer. This course will emphasize building speed and accuracy and will also cover business reports, interoffice memorandums and business letters with envelopes. It may be necessary to have access to a computer outside of class in order to complete the assignments. A student computer lab is available on each campus. (Prereq: Qualifying score on keyboarding assessment test OR CPLT1000) **(BP/EP) 3 cr**

CPLT1010 KEYBOARD SKILL BUILDING

This course will involve the development and improvement of keyboarding technique, accuracy and speed. Emphasis will be on speed building while maintaining good accuracy. The keyboarding goal will be to consistently improve keyboarding speed while making not more than one error per minute. (Prereq: CPLT1005) **(BP/EP) 2 cr**

CPLT1060 INTERNET QUICK START

This introductory course will provide basic instruction on the use of the Internet and e-mail. Topics covered will include browser, configuration, cache setup, bookmarks/favorites, printing text and images, and search techniques. Web-based e-mail accounts will be set up for those who do not have them. (Prereq: None) **(BP/EP) 1 cr**

CPLT1100 INTRODUCTION TO PERSONAL COMPUTERS

This course introduces the student to the basics of personal computer use, including the operating system and an overview of Word, Excel, Access, and PowerPoint. Basics of web browsing and searching, using e-mail, and evaluating computer purchases are included. It may be necessary to have access to a computer outside of class in order to complete the assignments. A student computer lab is available on each campus. (Prereq: Keyboarding skills strongly recommended to successfully complete this course. If you achieved less than 15 net words a minute on the keyboarding assessment test, take CPLT1000 prior to CPLT1100) **(BP/EP) 3 cr**

CPLT1200 INTRODUCTION TO MACINTOSH

This is an introductory course intended to give the student basic knowledge of the Macintosh operating system as well as a general overview of computer components. Through lecture and lab the student will explore basic operating system functions, computer components, terminology, file management, and disk management. Students will become familiar with various control panel settings, multitasking features, basic Internet access, e-mail functions, page setup, printing specifics, IPhoto, IMovie, and other features that are drawing, painting, and spreadsheet functions. (Prereq: None) **(BP/EP) 3 cr**

CULA1105 INTRODUCTION TO CULINARY ARTS

This course is designed to introduce the food service industry, its history, organization, the importance of safety/sanitation and the care and use of kitchen tools and equipment. It will also include product identification, recipe structure, menu planning, basic dining room operations, plus basic cooking principles. Fundamental culinary math skills that are required such as weights and measures, recipe conversion, yield tests, menu-pricing, inventories and food costs are studied. (Prereq: None) **(BP/EP) 3 cr**

CULA1115 FOOD SERVICE SANITATION AND SAFETY

This course is designed to teach students the importance of food safety and kitchen sanitation. Topics to be discussed will include: microbiology, food-borne illness, and standards enforced by regulating agencies to prevent food poisoning. Hazard Analysis Critical Control Points (H.A.C.C.P.), a system designed to reduce or eliminate unsafe food handling; preparation, storage, and service practices will also be covered. (Prereq: None) **(BP/EP) 2 cr**

CULA1125 BASIC BAKING AND PASTRY

This course is designed to give the student fundamental knowledge, skills and understanding in baking techniques, which includes pie/cookies, quick/yeast breads, rolls, desserts and dessert sauces. (Prereq: None) **(BP/EP) 3 cr**

CULA1135 BASIC PANTRY AND GARDE MANGER

This course is designed to give the student fundamental knowledge, skills and understanding in the preparation of various types of salads/salad dressings, vegetable and starch products, sandwiches, canapés and hor d'oeuvres. (Prereq: None) **(BP/EP) 3 cr**

CULA1145 PROTEIN FABRICATION AND CHARCUTERIE

This course is designed to give the student fundamental knowledge, skill, and understanding of basic butchering and processing techniques as applied to meat, poultry, fish and shellfish. Fresh and cured meat processing such as sausage, and terrines are also examined. (Prereq: None) **(BP/EP) 1 cr**

CULA1155 BASIC COOKING PRINCIPLES AND PROCESSES

This course is designed to give the student fundamental knowledge, skill, and understanding of basic stocks, sauces, soups, meat, poultry, fish, shellfish cookery, and breakfast food preparation techniques. (Prereq: None) **(BP/EP) 4 cr**

CULA1160 BASIC SUGAR WORK

This course is designed to give the students advanced knowledge, skill and understanding in the various types of sugar work. (Prereq: CULA1115) **(BP) 2 cr**

Course Descriptions

CULA1200 GARDE MANGER
This course is designed to teach the students the fundamentals of garde manger decorating. These items are mainly used for buffets, weddings and specialty parties. Developing skill and knowledge in the preparation and production of these items is a very specialized area of the food service industry. (Prereq: CULA1301, CULA1311, CULA1321, CULA1331 and CULA1340) **(BP/EP) 1 cr**

CULA1210 BAKING PRODUCTION FOODS
This course is designed to give the student advanced knowledge, skill and understanding in the preparation and production of bakery foods. It will include learning about quick/yeast breads/rolls, dessert/dessert sauces, pies, puff pastries, and cake decorating. (Prereq: CULA1105, CULA1115, CULA1125, CULA1135, CULA1145, CULA1155, CULA1301, CULA1311, CULA1321, CULA1331 and CULA1340) **(BP/EP) 4 cr**

CULA1220 PANTRY PRODUCTION FOODS
This course is designed to give the student advanced knowledge, skill and understanding in the preparation of various types of salads/salad dressings/vegetables and starch foods. (Prereq: CULA1105, CULA1115, CULA1125, CULA1135, CULA1145, CULA1155, CULA1301, CULA1311, CULA1321, CULA1331 and CULA1340) **(BP/EP) 4 cr**

CULA1230 RANGE PRODUCTION FOODS
This course is designed to give the student advanced knowledge, skill and understanding in the preparation of stocks, sauces, soups, meat/poultry/fish/shellfish, butchery and range food cookery techniques. (Prereq: CULA1105, CULA1115, CULA1125, CULA1135, CULA1145, CULA1155, CULA1301, CULA1311, CULA1321, CULA1331 and CULA1340) **(BP/EP) 4 cr**

CULA1240 DINING ROOM SERVICE
This course is designed to give the student basic knowledge and understanding of dining room, tableside and beverage service and techniques. The student will demonstrate the relationship between the kitchen and dining room staff and procedures followed for private bookings. (Prereq: CULA1105, CULA1115, CULA1125, CULA1135, CULA1145, CULA1155, CULA1301, CULA1311, CULA1321, CULA1331 and CULA1340) **(BP/EP) 4 cr**

CULA1301 CULINARY ARTS NUTRITION
The study of nutrition principles and the relationship of food to health from the perspective of culinary professionals. Students become familiar with the structure, function, and sources of nutrients including protein, carbohydrates, fats, vitamins, minerals, and water. Current dietary guidelines, energy balance, food fads and trends are discussed. Students prepare traditional and nutritionally modified recipes. (Prereq: None) **(BP/EP) 2 cr**

CULA1311 SUPERVISORY MANAGEMENT
The study of human relationships with a focus on developing the skills necessary to the leadership of professional hospitality organizations. Methods and techniques will be developed to attract, train, motivate, and retain personnel that meet or exceed the expectations of the establishments clientele. (Prereq: None) **(BP/EP) 2 cr**

CULA1321 DECORATIVE WORK AND SHOWPIECES
Principles of decorative product preparation and the presentation of various food mediums including but not limited to ice carving, cake decorating and confectionery work. Food styling factors such as balance, design, color, and the techniques of garniture used in the professional kitchen will be emphasized. Students will be given the opportunity to explore and develop their artistic abilities. (Prereq: None) **(BP/EP) 2 cr**

CULA1331 PURCHASING AND MENU DESIGN
The study of food, equipment, supplies, and services used in the hospitality industry. Emphasis is placed on product grades, specifications, and yields to assure quality level objectives are achieved. Methods to control costs while maintaining strict quality and quantity standards through effective purchasing of goods and services are examined. Students develop the skills necessary to design menus for various operations and an appreciation of the vital role menus play in marketing a food establishment. (Prereq: None) **(BP/EP) 2 cr**

CULA1340 QUANTITY FOODS AND INTERNSHIP
This course is a cooperative training program between the Culinary Arts program and the Hennepin Technical College Quantity Food Production Cafeteria Department. It is intended to allow the student to apply basic knowledge and skills to an employment-like work experience. Students will strive to develop knowledge, skills, speed, equipment safety and sanitation in the areas of: kitchen management/supervision, storeroom controls and procedures, range, pantry, bakery and short order cooking techniques. The student may elect to apply skills learned in the program courses by interning at an approved establishment. This supervised experience will include preparation, service and assisting activities through practical experience, observation and use of the training manual. The student will enroll for two (2) credits to enhance career goals. (Prereq: CULA1105, CULA1115, CULA1125, CULA1135, CULA1145, CULA1155 or instructor approval) **(BP/EP) 2 cr**

CULA1501 SEASONAL/SPECIALTY MENUS AND WINES
This course is designed to give the student advanced knowledge, skill and understanding in the development and preparation of brunch, special occasion, seasonal and ethnic menus and an emphasis of healthful cooking and the dynamics of the interaction between food and wine. (Prereq: None) **(BP/EP) 3 cr**

CULA1510 TOPICS OF GLOBAL CUISINE
This course is designed to give the student advanced knowledge, skill and understanding in the preparation of ethnic stocks, sauces, soups, meat/poultry/fish/shellfish. Among the topics that may be included are: presentations, techniques for casual service, menus and global influences on cuisine. (Prereq: None) **(BP/EP) 3 cr**

CULA1520 CUISINE OF THE AMERICAS
This course studies the preparation, tastes, service, and evaluates traditional, regional dishes of the Americas. Emphasis is placed on ingredients, flavor profiles, preparation methods, and techniques representative of the cuisine's of Canada, the United States, the Caribbean, Central and South America. (Prereq: None) **(BP/EP) 3 cr**

CULA2100 GUEST SERVICE MANAGEMENT
This course studies traditional and classical service methods and the emerging new styles of guest service. Students gain the knowledge and skills necessary for hands-on management of food and beverage service. Students will demonstrate organizational skills for operating a dining room, developing and using effective guest relations, employee staffing and marketing a restaurant. (Prereq: None) **(BP/EP) 3 cr**

CULA2110 HOSPITALITY MARKETING AND SALES
Analysis of theories, fundamental principles and techniques of hospitality marketing and group function sales, interrelationships and coordination of all hospitality departments and their roles in assuring success of marketing efforts. (Prereq: None) **(BP/EP) 3 cr**

CULA2120 CATERING MANAGEMENT
This course explores the essence of catering – the food, the atmosphere, the presentation, and the service. As an orientation to the field of catering, this course includes all of the activities associated with the sales, organization, food preparation, and service of catered functions, banquets and other special event functions, including hotel room service. Both on and off premise catering principles and their practical operational requirements will be studied. (Prereq: None) **(BP/EP) 3 cr**

CULA2140 FOOD, BEVERAGE AND LABOR COST CONTROLS
Techniques and procedures to control food, beverage, and labor costs in hospitality food service operations are thoroughly explored and developed. Basic hospitality accounting practices, financial statements, budgets, and financial planning is covered. (Prereq: None) **(BP/EP) 3 cr**

CULA2150 BAR AND BEVERAGE MANAGEMENT
This course focuses on the management of both alcoholic and non-alcoholic beverages and the legal and liability issues involved with them. Product knowledge, storing, pricing, merchandising, and serving wines and spirits in restaurant settings are emphasized. The course examines the theory of matching food with wines, beers, and other beverages. (Prereq: None) **(BP/EP) 3 cr**

CULA2160 HOSPITALITY LAW
An overview of the legal issues and requirements associated with operating a food service establishment. Topics include: contract law, forms of business enterprise, legal obligations of owners and employees, liabilities, dram shop law, and operating within state and federal regulations. (Prereq: None) **(BP/EP) 3 cr**

CULA2170 FACILITIES DESIGN AND MAINTENANCE
Proper food service equipment arrangement is required for efficient use of space and the development of workflow patterns and human engineering is a major consideration. Technical and managerial issues related to the operation and maintenance of the physical plant and equipment used by hospitality industry facilities is thoroughly examined. (Prereq: None) **(BP/EP) 3 cr**

CULA2200 FOOD AND BEVERAGE MANAGEMENT EXTERNSHIP
A supervised work experience designed to expand your career knowledge while increasing your speed, timing, organization, and ability to handle the duties as assigned in an approved commercial food service establishment. You will receive feedback from your supervisor and keep a journal recording and reflecting on your work experience. (Prereq: None) **(BP/EP) 3 cr**

DNTL1000 INTRODUCTION TO DENTAL ASSISTING
This course is designed to give the student a fundamental understanding of the characteristics of dentistry. It will include dental terminology, the history of dentistry, its team members, specialties, professional organizations, legal and ethical considerations and the differences between certification and registration. Dental business office procedures are also included. Students will make appointments, complete patient financial records and insurance forms, and realize the importance of good telephone techniques. (Prereq: Current CPR certification and qualifying score on CPT reading and writing assessment test) **(BP/EP) 2 cr**

DNTL1120 DENTAL SCIENCE
This course is designed to provide information on basic head and neck anatomy, tooth morphology, oral histology and embryology and the basics of the human body systems. Oral pathology is included and contains a background in the identification, causes, symptoms and transmission of various oral diseases. (Prereq: DNTL1000 or concurrent, and qualifying score on CPT reading and writing assessment test) **(BP/EP) 3 cr**

DNTL1140 DENTAL MATERIALS
This course will introduce the student to various materials used in dentistry. These include hazardous materials, gypsum, waxes, impression materials, cements (protective layers) and restorative materials. The student will learn identification, purposes and properties as well as the proper manipulation/preparation procedure for each. Environmental hazards management and laboratory safety measures will be emphasized. (Prereq: DNTL1000 and DNTL1120 or concurrent and qualifying score on CPT reading and writing assessment test) **(BP/EP) 3 cr**

DNTL1160 PRE-CLINICAL CHAIRSIDE ASSISTING
In this course the student will learn about microbiology, sterilization, monitoring and recording vital signs as well as how to respond to various medical emergencies that may arise in the dental office. The course will emphasize the prevention of disease transmission. The student will also learn about anesthesia and pharmaceuticals used in dentistry. Types, uses and legal responsibilities are included. (Prereq: DNTL1000 and DNTL1120 or concurrent, and qualifying score on CPT reading and writing assessment test) **(BP/EP) 3 cr**

DNTL1180 CHAIRSIDE ASSISTING I
In this course the student will gather and record medical and dental histories and chart the oral cavity. Students gain knowledge about dental supplies and inventory control, basic dental equipment, its maintenance and safety, dental instruments, handpieces and rotary instruments. Dental instruments, grasps and transfer will also be included in this course. Practical learning experience will include how to position the dental team and patient control of moisture in the oral cavity as well as high velocity evacuation techniques. (Prereq: DNTL1100, DNTL1120 and DNTL1160 or concurrent, and qualifying score on CPT reading and writing assessment test) **(BP/EP) 4 cr**

DNTL1200 DENTAL HEALTH
This course will assist the student in identifying psychological variables that are significant in dealing with dental patients and co-workers. The student will also study nutrition and its effects on the human body. Emphasis is made on proper oral hygiene techniques and evaluation of the patient's health care status. (Prereq: DNTL1000, DNTL1120 and DNTL1160 or concurrent) **(BP/EP) 2 cr**

DNTL1220 CHAIRSIDE ASSISTING II
This course is designed to develop skills in four-handed dental assisting, including tray setup preparation. It also will introduce the student to the specialized areas of dentistry and the instruments, materials and procedures needed for each. (Prereq: DNTL1000, DNTL1120, DNTL1140, DNTL1160, DNTL1180 and DNTL1200 or concurrent) **(BP/EP) 4 cr**

DNTL1241 DENTAL RADIOLOGY
This course is designed to introduce the student to the basic principles of x-ray production. Biological effects of ionizing radiation and safety procedures are covered. Also included is the exposing, processing, monitoring and evaluating of dental film. The student will gain practical experience in producing intraoral radiographs on typodonts in a clinical setting. Radiation safety policies are practiced and monitored. (Prereq: DNTL1000, DNTL1120, DNTL1160 and DNTL1180 or concurrent, and qualifying score on CPT reading and writing assessment test) **(BP/EP) 4 cr**

DNTL1261 EXPANDED FUNCTIONS
This course is designed for the students to learn and practice all of the expanded functions in the Hennepin Technical College clinics. This course is required by the Minnesota State Board of Dentistry to be eligible to take the Minnesota Registration examination. (Prereq: CPR Certified Hepatitis B Vaccine or written decline, DNTL1000, DNTL1120, DNTL1140, DNTL1160, DNTL1180, DNTL1220, DNTL1241 and DNTL1200 or concurrent) **(BP/EP) 7 cr**

DNTL1321 CLINICAL EXTERNSHIP I
This will be a cooperative training program between Hennepin Technical College and a dental facility which allows the student to apply skills learned in the program to an employment-like work experience. This will include general dentistry and specialties such as oral surgery, orthodontics, endodontics, public health or pediatrics. (Prereq: CPR Certified, Hepatitis B Vaccine or written decline, DNTL1000 thru DNTL1261) **(BP/EP) 4 cr**

DNTL1325 CLINICAL EXTERNSHIP II
This will be a cooperative training program between Hennepin Technical College and a dental facility which allows the student to apply skills learned in the program to an employment-like work experience. This will include general dentistry and specialties such as oral surgery, orthodontics, endodontics, public health or pediatrics. (Prereq: CPR Certified, Hepatitis B Vaccine or written decline and DNTL1321) **(BP/EP) 4 cr**

DNTL1400 DENTAL PRACTICE MANAGEMENT INTERNSHIP
This course will be a cooperative training program between Hennepin Technical College and a dental facility which allows the student to apply skills learned in this advanced certificate program to an employment-like work experience. (Prereq: COMMUNICATIONS1130, OFCR1010, and OFCR1080) **(BP/EP) 1 cr**

ELEC1000 DC CIRCUITS
This course will provide the student with basic electronic concepts as they apply to direct current circuits. Circuits will consist of a voltage source and one or more resistors. The student will compute circuit parameters and these will be compared to measured values from a breadboarded or computer simulated circuit. The student will learn the IEEE color code and to safely and correctly use both analog and digital meters to measure voltage, current and resistance. (Prereq: None) **(BP) 4 cr**

ELEC1050 AC CIRCUITS
This course is designed to provide the student with the basic electronic concepts as they apply to the generation and measurement of alternating current. The student will compute AC voltages and currents in resistive capacitive and inductive circuits. These will then be compared with data measured with both the multimeter and oscilloscope. The student will learn to correctly and safely use Two Trace Oscilloscopes, AC meters and function generators. Circuits will be designed and evaluated by breadboarding and/or computer simulation software. (Prereq: ELEC1000 or equivalent) **(BP) 4 cr**

ELEC1100 COMPLEX AC CIRCUITS
This course is designed to provide the student with the basic electronic concepts as they apply to RCL circuits such as resonant, filter and timing circuits. The student will compute voltages, currents and times in these circuits. These will then be compared with data measured with both multimeter and oscilloscope. Circuits will be designed and evaluated by breadboarding and/or computer simulation software. (Prereq: ELEC1050 or equivalent) **(BP) 3 cr**

ELEC1150 DIODES AND RECTIFIERS
This course is designed to provide the student with the basic electronic concepts as they apply to semiconductor diode and rectifier circuits including special purpose diodes such as light emitting diodes, laser diodes, varactor diodes and zener diodes. The student will compute component and circuit parameters. These will then be compared with measured data. Circuits will be designed and evaluated by breadboarding and/or computer simulation software. (Prereq: ELEC1100 or equivalent) **(BP) 2 cr**

ELEC1200 SOLDERING SKILLS
This course develops skill in soldering components to a printed circuit board and replacing defective components by desoldering, preparing the board and resoldering new components. A soldering project is fabricated as part of the class. The student will learn the proper use and care of soldering and desoldering equipment. The student will learn the proper use of flux and other chemicals. Safety concerns will be a major component of this course. (Prereq: None) **(BP) 1 cr**

ELEC1250 SOLID STATE COMPONENTS AND CIRCUITS
This course will introduce students to a wide range of active solid-state devices such as transistors, unijunction transistors and silicon-controlled rectifiers. It also teaches how these devices are used in practical circuits such as amplifiers, speed controls, switching circuits and timing circuits. The student will compute component and circuit parameters. These will then be compared with measured data. Circuits will be designed and evaluated by breadboarding and/or computer simulation software. (Prereq: ELEC1150 or equivalent) **(BP) 5 cr**

ELEC1300 OPERATIONAL AMPLIFIERS
This course will introduce students to integrated analog amplifier, timing and waveshaping circuits. Students will test the components for proper operation and parameters. Students will design and build a variety of practical circuits utilizing operational amplifiers. They will test all circuits for proper operation and compute component and circuit parameters. These will then be compared with measured data. Circuits will be designed and evaluated by breadboarding and/or computer simulation software. (Prereq: ELEC1250 or equivalent) **(BP) 2 cr**

ELEC1350 REGULATED POWER SUPPLIES
In this course students will learn how circuits can regulate and control voltages and currents. A variety of practical power supply circuits will be built and tested. Circuits will be designed and evaluated by breadboarding and/or computer simulation software. (Prereq: ELEC1250 or equivalent) **(BP) 2 cr**

ELEC1400 BASIC TROUBLESHOOTING
This course will allow students to troubleshoot larger circuits and systems. Students will utilize schematics, wiring diagrams, functional block diagrams, component placement diagrams, deductive reasoning and test equipment to determine faulty circuits and components. A practical troubleshooting exercise will be the final test. (Prereq: ELEC1250 or equivalent) **(BP) 3 cr**

ELEC1450 BASIC DIGITAL LOGIC
This course introduces the student to digital electronic circuits. Numbering systems are introduced and a variety of binary codes discussed. Logic family characteristics are discussed. The use of truth tables, Boolean algebra and Karnaugh Maps are used to analyze, troubleshoot and design digital circuits. The different types of flip-flops and their applications are discussed and analyzed. (Prereq: ELEC1250 or equivalent) **(BP) 3 cr**

ELEC1500 INTRODUCTION TO TELECOMMUNICATIONS
This course is an introduction to telecommunications and includes information on transmission media and physical layer components, safety, tools used in network cabling, and testing and troubleshooting. (Prereq: None) **(EP) 2 cr**

ELEC1525 INTRODUCTION TO COPPER BASED SYSTEMS

This course is designed to provide students with the knowledge and skills necessary to become entry-level technicians in the Network Cabling industry. The focus of the course is on tool use and construction techniques, characteristics of various industry standards and troubleshooting and repair. (Prereq: ELEC1500) **(EP) 2 cr**

ELEC1550 INTRODUCTION TO FIBER OPTIC BASED SYSTEMS

This course introduces students to Fiber Optic Systems. The focus of the course is on fiber optic theory, tool use, and construction techniques. The characteristics of various fiber optic components and troubleshooting and repair. (Prereq: ELEC1525) **(EP) 2 cr**

ELEC1600 NATIONAL ELECTRIC CODE

This course introduces the Minnesota licensing requirements and presents an introduction to the National Electrical Code. Topics included are the purpose of the code, definitions, general requirements, services, feeders, branch circuits, over current protection, grounding, and conductors. Requirements for raceways, boxes, motors, motor controls, air conditioning equipment, transformers, generators, hazardous locations, special conditions, health care facilities, emergency systems, communications systems, low-voltage systems, swimming pools and spas will be discussed. Various articles will be used with examples provided. (Prereq: None) **(BP) 4 cr**

ELEC2000 COMPUTER CIRCUITS AND APPLICATIONS I

This course applies the concepts presented in the course Basic Digital Logic. It also covers the circuits that are in basic digital systems such as registers, counters, adders and comparators. Complex digital circuits, such as Memory circuits, the ALU and a basic computer system are discussed and analyzed. Other common digital integrated circuits are also included in this course. (Prereq: ELEC1450 or equivalent) **(BP) 4 cr**

ELEC2020 COMPUTER CIRCUITS AND APPLICATIONS II

This course presents the operation of complex digital circuits. Examples of circuits that are explored are selector circuits, multiplexers, demultiplexers, analog to digital and digital to analog converters. Digital test instruments and digital troubleshooting are also discussed. (Prereq: ELEC2000 or equivalent) **(BP) 3 cr**

ELEC2050 ADVANCED TROUBLESHOOTING

This course will allow students to troubleshoot complex circuits and systems. Students will utilize schematics, wiring diagrams, functional block diagrams, component placement diagrams, deductive reasoning and test equipment to determine faulty circuits and components. A timed practical troubleshooting exercise and the work done during the course will be used to evaluate the student. (Prereq: ELEC1400 or equivalent) **(BP) 4 cr**

ELEC2100 MOTOR AND MOTOR CONTROLLERS

This course covers the characteristics of D.C., A.C. and stepper motors. Controller operation for these motors is also covered. Motor generators sets are used to study conversion of mechanical energy to electrical energy. (Prereq: ELEC1250 and ELEC1300 or equivalent) **(BP) 3 cr**

ELEC2200 MICROPROCESSORS AND MICROCOMPUTERS I

This course introduces the student to system and microprocessor architecture, timing and the instruction set. Using the instruction set, the student will be able to write simple application programs. (Prereq: ELEC2000 and ELEC2020 or equivalent) **(BP) 4 cr**

ELEC2220 MICROPROCESSORS AND MICROCOMPUTERS II

This course builds on the concepts presented in Microprocessors and Microcomputers I. The student will write programs that service various simple input and output devices. Various issues concerning small microcomputer design will also be discussed, such as hardware/software trade offs. (Prereq: ELEC2200) **(BP) 4 cr**

ELEC2300 TROUBLESHOOTING COMPUTERS

This course provides practical experience in troubleshooting the IBM compatible systems. The student will diagnose hardware and software problems using DOS and Windows operating systems. The student will troubleshoot to the lowest repairable module (LRM). A final performance test will be given. (Prereq: ELEC2020 or equivalent) **(BP) 3 cr**

ELEC2400 INDUSTRIAL CONTROLS

This course covers the fundamental concepts of input and output transducer circuits, position and motion detection. These concepts will be studied from an analog and digital point of view. (Prereq: ELEC1450, ELEC2000 and ELEC2020 or equivalent) **(BP) 2 cr**

ELEC2420 TELEMETRY

This course covers the fundamental concepts of signal interfacing and telemetry circuits in industrial situations. (Prereq: ELEC2400) **(BP) 2 cr**

ELEC2500 A+ CERTIFICATION PREPARATION

This course provides students with knowledge of configuring, installing, diagnosing, repairing, upgrading, and maintaining microcomputers, for preparation of the A+ certification exams. (Prereq: None) **(BP) 4 cr**

ELEC2600 ELECTRONICS TECHNOLOGY INTERNSHIP

The course provides students with an internship experience in electronics. Students are evaluated by predetermined curriculum objectives agreed upon by the employer, instructor and student. The student is expected to interview for and acquire an internship site. (Prereq: Instructor approval) **(BP) 1-8 cr**

EMGT1100 ORIENTATION TO EMERGENCY MANAGEMENT
This course will provide students with an introduction to the comprehensive emergency management programs administered by the Minnesota Division of Emergency Management and the Federal Emergency Management Agency. Students will formulate the elements of an integrated teamwork system and devise specific actions for improving their own contributions to local emergency management teams. (Prereq: None) **(Hopkins Tech Center) 3 cr**

EMGT1105 INTRODUCTION TO PLANNING AND MITIGATION
This course will provide students with the planning and mitigation skills required to prepare an integrated Emergency Management plan. Maintaining continuity of governmental services during an actual emergency and an introduction to hazardous materials in the community will also be covered. (Prereq: None) **(Hopkins Tech Center) 3 cr**

EMGT1110 EMERGENCY MANAGEMENT COMMAND AND CONTROL
This course will provide students with the skills necessary to function within the framework of the Minnesota Incident Management system and knowledge of how the system interacts with the Minnesota Emergency Operations Center. Planning for and responding to emergencies or disasters with large numbers of casualties or fatalities will also be covered. (Prereq: None) **(Hopkins Tech Center) 4 cr**

EMGT1115 COMMUNITY DISASTER EXERCISES
This course will provide students with the necessary skills to plan, design, conduct and evaluate a community's emergency plan. The content illustrates the eight basic steps in exercise design and emphasizes the use of a design team. The students will participate in actual exercises developed by the class. An internship with a local emergency management program will be required as part of this course work. (Prereq: None) **(Hopkins Tech Center) 4 cr**

EMGT1120 EMERGENCY MANAGEMENT LEADERSHIP AND COMMUNICATIONS
This course is designed to increase the student's skills in the areas of leadership, conflict management and the use of influence and power during emergency planning and operations. One-to-one and small group communications, public speaking and information dissemination will be discussed, along with planning, response and recovery operations involving debris management and environmental impact. (Prereq: None) **(Hopkins Tech Center) 3 cr**

EMGT1125 EMERGENCY MANAGEMENT RESOURCE MANAGEMENT
This course is designed to provide the students with the skills necessary to develop and manage a wide variety of volunteer resources and disaster relief services. The students will have an opportunity to practice decision-making skills and make emergency-related decisions during various exercises. Planning and managing volunteer donations will also be covered. (Prereq: None) **(Hopkins Tech Center) 3 cr**

EMSV1100 EMERGENCY MEDICAL TECHNICIAN - BASIC
This course uses the new guidelines established by the US DOT and meets the requirements established by the Minnesota EMS Regulatory Board (MN EMSRB). Upon successful completion of the course and National Registry of EMT Practical Skills exam, you are eligible to take the NREMT written exam (additional $20 fee required). State and National certifications will be issued upon passing these tests. Current EMT certification is a prerequisite for most paramedic programs. Books available at Campus Bookstores. (Prereq: Current CPR Health Care Provider certification (offered 1st week of class), 18 years old, required vaccinations, background studies will be required) **(Hopkins Tech Center) 6 cr**

EMSV1105 AMBULANCE OPERATIONS
This course will focus on additional technical and clinical skills that are needed for use to work in the EMS field, but not covered in depth during the EMT-Basic course. Students will have the opportunity to prepare for ambulance work, clinical internships, and future courses in EMS. The course is challenging, and is based on experimental educational principles; students will learn by doing. The class is designed to help transfer classroom learning to field operations. Hudson Map book required for 1st class session. (Prereq: Current State Certified EMT-B, valid driver's license, be in good health and have no lifting restrictions) **(Hopkins Tech Center) 2 cr**

EMSV1110 LIFTING TECHNIQUES FOR HEALTH PROFESSIONALS
This course will focus on the use of proper body mechanics, lifting techniques, back strengthening exercises and general cardiovascular conditioning necessary for pre-hospital and in-hospital personnel. Books available at Campus Bookstores. (Prereq: Be in good health and have no lifting restrictions) **(Hopkins Tech Center) 1 cr**

EMSV1115 PASSENGER ASSISTANT TECHNICIAN
This course meets partial requirements for Special Transportation Services by the Minnesota Department of Transportation (MN DOT). Topics include Passenger Assistance Part I and II (working with elderly/disabled, understanding, utilizing assisting techniques and devices), abuse prevention and defensive driving. (Prereq: None) **(Hopkins Tech Center) 1 cr**

EMSV1120 AMBULANCE INTERNSHIP
Students will participate in the various aspects of an EMT at a major Twin Cities metropolitan ambulance service. This will include Advance Life Support (ALS). The internship is eighty hours. (Prereq: Current State Certified EMT-B, current Health Care Provider CPR certification, successfully completed all required EMS Certificate courses, background check and vaccinations required and approval of EMS Program Coordinator) **(Hopkins Tech Center) 2 cr**

Course Descriptions

EMSV1130 EMERGENCY VEHICLE DRIVING SKILLS

This course includes classroom and behind the wheel training for ambulance personnel. The course includes basic and advanced driving skills and Code 3 driving. A driving range is used which includes straight-line braking, control braking, backing, serpentine, skid control, emergency vehicle cornering, dual surface braking, use of red lights and siren and parking. (Prereq: Currently enrolled in EMSV1100 or current MN State Certified EMT-B, 18 years old, valid drivers license with good driving record) **(Hopkins Tech Center) 1 cr**

EMSV1135 UNDERSTANDING EKG'S

You will review the anatomy and cardiovascular physiology of the heart. Basic understanding the mechanics of electrocardiograms and interpretation of arrhythmias is included. Practice of EKG strips identification is covered. Application of twelve (12) leads EKG's will be explained and practiced. Legal and ethical aspects are discussed. Books available at Campus Bookstores. (Prereq: EMSV1100)
(Hopkins Tech Center) 1 cr

EMSV1140 CPR INSTRUCTOR

In this course, you will acquire the knowledge and skills necessary to fairly and accurately instruct and test students in Basic Life Support CPR procedures: Graduates will receive a successful completion certificate that can be given to a local Community Training Center (CTC) to obtain their American Heart Association BLS Instructor certification. Books available at Campus Bookstores. (Prereq: Current CPR for Health Care Provider Certificate or instructor approval)
(Hopkins Tech Center) 1 cr

EMSV1145 MEDICAL TERMINOLOGY FOR EMS/ER PERSONNEL

You will analyze the construction of medical root words plus use of common medical prefixes and suffixes. Medical abbreviations will be included to assist you in your documentation on Emergency Department (ED) patient records/ EMS run sheets and communication with other health professionals. Books available at Campus Bookstores. (Prereq: Currently enrolled in EMSV1100 or instructor approval) **(Hopkins Tech Center) 2 cr**

EMSV1150 FIRST RESPONDER

This course is designed to provide the 1st Responder at the scene of a medical or trauma emergency, with the necessary knowledge and skill to manage patient care until the arrival of ambulance personnel. The course is intended for law enforcement, firefighters, rescue personnel, ski patrol, athletic coaches, school nurses, camp counselors, special event coverage personnel, industrial emergency response teams and other individuals charged with "first response" duties. This course meets or exceeds the guidelines set forth by the United States Department of Transportation and the Minnesota EMSRB. Books available at Campus Bookstores.
(Prereq: None) **(Hopkins Tech Center) 3 cr**

EMSV1155 PHLEBOTOMY TECHNIQUES

In this course, you will learn venipuncture, IV and special collection procedures. Quality management and legal issues, specimen collections, documentation and lab procedures will be covered. You will acquire the basic knowledge of the circulatory system as it pertains to phlebotomy. Safety and infection control measures are extensively explored. Clinic lab is included. Books available at Campus Bookstores.
(Prereq: EMSV1100) **(Hopkins Tech Center) 3 cr**

EMSV1165 EMT-BASIC + CPR

This course uses the new guidelines established by the US DOT and meets the requirements established by the Minnesota EMS Regulatory Board (MN EMSRB). Upon successful completion of the course and National Registry of EMT Practical Skills exam, you are eligible to take the NREMT written exam (additional $20 fee required). State and National certifications will be issued upon passing these tests. Current EMT certification is a prerequisite for most paramedic programs. (Prereq: 18 years old, required vaccinations, background studies will be required) **(Hopkins Tech Center) 7 cr**

EMSV1170 ER PROCEDURES AND INTERNSHIP

This course will provide the student with the necessary skills to assist with various Emergency Dept. (ED) procedures such as IV setup, sterile technique, insertion of catheters, wound cleansing, suturing assistance and other medical procedures used in ED settings. Also included are various orthopedic procedures and use of devices such as: cast setup and removal, splints, crutch sizing and usage. Upon completion of classroom/lab sessions students will participate in internship in a ED setting by observing patient care. This will take place in the Emergency Department. Books available at Campus Bookstores. (Prereq: EMSV1100, EMSV1110, EMSV1145)
(Hopkins Tech Center) 3 cr

EMSV1250 FIRST RESPONDER ONLINE

This course blends online training with hands-on classroom skills training. You start your training with a MANDATORY orientation class then from home, school, work or anywhere you can access a computer and the internet. You will work within a rich, interactive, multimedia CD-ROM (WEB-ROM) that connects live to the internet so instructors can track your progress and assist when you need help. Audio, video, virtual reality scenarios, text, quizzes, and even a virtual game show will enhance your learning experience and test your knowledge and skills. Upon completion, you will be able to assist with medical emergencies as a First Responder, just as police, fire, a company's medical response team and other emergency professionals do that have a "duty to respond." The course meets US Department of Transportation (DOT) and Minnesota Emergency Medical Services Regulatory Board (EMSRB) requirements. Two-year EMSRB First Responder Certification is issued upon completion. Twenty (20) hours of hands-on skill practice training and practical tests, on campus, are required. (Prereq: None) **(Hopkins Tech Center) 3 cr**

ENGC1011 ENGINEERING DRAWING I
This is a basic engineering drawing course. It is designed to give the student the necessary skills to draw a mechanical part. Orthographic projection sectional view sketching dimensioning and tolerancing techniques will be covered. (Prereq: MACH1056 and ENGC1100 or ENGC2100) **(BP/EP) 3 cr**

ENGC1021 ENGINEERING DRAWING II
This course introduces the student to the techniques, standards and methods used to place dimensions onto a production drawing. Methods for calculating tolerance, placing the tolerance onto a drawing and the effect of tolerancing on the dimensioning process is also covered. (Prereq: ENGC1011) **(BP/EP) 3 cr**

ENGC1041 GEOMETRIC DIMENSIONING & TOLERANCING
This course is designed to give the student a fundamental understanding of the terms, symbols and principles relating to controlling geometric variations of manufactured parts. Controls include tolerances of forms, orientation and position. (Prereq: ENGC1011 or instructor approval) **(BP/EP) 3 cr**

ENGC1100 AUTOCAD I
This course consists of setting up a drawing environment, creating geometric shapes, creating text, dimensioning drawings, manipulating and editing displays, plotting drawings, and retrieving entity data. Aspects of the disk operating system is also covered. The student will get "hands-on" instruction using AutoCAD's latest release. (Prereq: None) **(BP/EP) 4 cr**

ENGC1160 INVENTOR
This course is designed to educate the student in basic part and assembly modeling techniques. Students will explore topics such as, the Autodesk Inventor R4 interface, sketching tools, part modeling tools, assembly modeling tools, the Design Assistant, creation of drawing views, working drawings and creating bills of materials. (Prereq: None) **(BP/EP) 4 cr**

ENGC1201 INDUSTRIAL CAD PROJECT
This course is designed as an industrial simulation. The student will be assigned a project and be expected to make a complete set of CAD drawings and product documentation. (Prereq: ENGC1021) **(BP/EP) 3 cr**

ENGC1250 SOLIDWORKS I
This course is designed to give students hands-on experience using SolidWorks three-dimensional Parametric CAD software. SolidWorks is a mechanical design software that takes advantage of the familiar Microsoft Windows graphical user interface. The students will use the software to create three-dimensional solid parts and assemblies. The students will also create orthographic projections from the solid geometry. Rapid prototyping may be presented in this course. (Prereq: None) **(BP/EP) 4 cr**

ENGC1255 SOLIDWORKS II
This course is designed to give additional hands-on experience using SolidWorks three-dimensional Parametric CAD software. The students will use the software to create and analyze three-dimensional solid parts and to create an animation of assembled parts. The students will also create eDrawings for Web publishing or sharing 3D models and 2D drawings. (Prereq: ENGC1250) **(BP/EP) 4 cr**

ENGC2000 MECHANICAL DESIGN
This course covers several design topics including the nature of design, fastener selection, mechanical drive selection, bearing selection, fixture design, and linkages. The student will get experience selecting these components from vendor catalogs and solving design/layout drawing problems. (Prereq: ENGC1010) **(BP/EP) 4 cr**

ENGC2011 SPECIAL FIELDS OF DRAFTING
This is a basic engineering drawing course. It is designed to give the student the necessary skills to draw a variety of type of industrial drawings including fasteners, intersections and developments, piping drawings, structural drawing, weldments and plant layouts. (Prereq: ENGC1021) **(BP/EP) 3 cr**

ENGC2050 AUTOCAD UPGRADE TRAINING
This course covers only the changes, enhancements and additions that have occurred with the latest release of the AutoCAD software package. (Prereq: None) **(BP/EP) 1 cr**

ENGC2075 ENGINEERING DESIGN PROJECT
This course will introduce the student to the design and prototyping process. The students will create a design using a three-dimensional CAD station and rapid prototype the design using a three-dimensional printer. Through the use of a variety of manufacturing machines and quality assurance equipment the student will produce a final product to meet the original design concept. (Prereq: Approved three-dimensional CAD application) **(BP/EP) 3 cr**

ENGC2100 PRO/ENGINEER I
This course is designed to give students hands-on experience using Parametric Technology's fully associative mechanical design automation software Pro/ENGINEER. Pro/ENGINEER is a feature-based solid modeling program. The student will use the software to create parts, assemblies, drawings, and rapid prototype models. (Prereq: None) **(BP/EP) 4 cr**

ENGC2110 PRO/ENGINEER II
This course is designed to increase the productivity of the novice Pro/ENGINEER user. This project based course covers advanced topics of Pro/ENGINEER including customizing the Pro/ENGINEER interface creating mapkeys, creating helical and variable section sweeps, applying advanced rounds, ribs and drafts, advanced patterns and family tables, user-defined features, Pro/Program advanced drawing functions, and advanced assembly functions. The student will also create rapid-prototype parts. (Prereq: ENGC2100 or equivalent or three months work experience) **(BP/EP) 4 cr**

Course Descriptions

ENGC2200 ENGINEERING CAD TECHNOLOGY INTERNSHIP

The student will receive 36 hours of on-site instruction in the drafting department of a "host" company for each credit for which he/she has registered. The student may register for 3 or 4 credits. The student will work in an industrial drafting environment on learning objectives mutually agreed to by instructors and a host-business. Before registering, the student should check with instructors on availability of a suitable host-business. (Prereq: Prior completion of 50 percent of the Engineering CAD Technology program) **(BP/EP) 3-4 cr**

ENGL0900 READING TECHNIQUES

This course will focus on developing and improving basic reading skills necessary for success in college course work. This will include skill level assessment and interpretation, comprehension techniques, strategies and individualized skill development. (Prereq: Qualifying score on CPT reading assessment test) **(BP/EP) 2 cr**

ENGL0905 ENGLISH SKILLS I

This course is designed for students who need to improve their grammar skills to be more effective writers. This course will involve an extensive, comprehensive study of English grammar, punctuation, and usage. (Prereq: Qualifying score on CPT English assessment test) **(BP/EP) 2 cr**

ENGL0910 FUNDAMENTALS OF WRITING

Writing is an essential element for successful communication in work and school settings. This course is designed to provide basic writing skills for all students. (Prereq: Qualifying score on CPT English assessment test OR ENGL0925) **(BP/EP) 2 cr**

ENGL0920 APPLIED READING TECHNIQUES

This course will focus on applying basic reading skills learned in Reading Techniques including reading, comprehending, summarizing, and synthesizing information in real-life reading passages of greater length. This will include skill level assessment and interpretation, comprehension techniques, summarizing and synthesizing information from graduated higher reading levels. This course is intended to give students an opportunity to practically apply previously learned skills. (Prereq: Qualifying score on CPT reading assessment test OR ENGL0900) **(BP/EP) 2 cr**

ENGL0925 ENGLISH SKILLS II

This course is designed for students who need to improve their grammar skills to be more effective writers. This course will involve applying an extensive, comprehensive study of more advanced English grammar, punctuation, and usage. (Prereq: Qualifying score on CPT English assessment test OR ENGL0905) **(BP/EP) 2 cr**

ENGL1001 BUSINESS LETTER AND MEMO WRITING

The workplace depends on efficient business correspondence. Written communication is especially important between customers or clients and business organizations. This course is designed to provide instruction in organizing and writing business letters and memos. (Prereq: Qualifying score on CPT English assessment test OR ENGL0910) **(BP/EP) 1 cr**

ENGL1010 BUSINESS COMMUNICATIONS

The majority of the time in this course will be spent on the spelling, grammar, punctuation, proofreading, and editing skills needed for success in the work world. Students will then apply these skills to produce a few short documents using correct English with appropriate formatting. (Prereq: None) **(BP/EP) 3 cr**

ENGL1020 ESSAY FUNDAMENTALS

This is an intermediate writing course, intended to develop essay writing skills. Students will learn basic research methods and develop critical thinking and reading skills. (Prereq: Qualifying score on CPT English assessment test OR ENGL0910) **(BP/EP) 2 cr**

ENGL1025 ESSENTIALS OF TECHNICAL WRITING

The workplace often depends on technical written communication. This course provides instruction in planning, organizing and writing technical documents and reports. Course emphasis is on effective writing skills and completion of various technical reports including instructional, periodic observation, and progress reports. (Prereq: Qualifying score on CPT English assessment test OR ENGL0910) **(BP/EP) 2 cr**

ENGL2120 WRITING AND RESEARCH

This course emphasizes the process of writing expository and persuasive essays using effective writing skills and a variety of research techniques. Students will also gain skills in critical reading and logical reasoning. (Prereq: Qualifying score on CPT English assessment test OR ENGL1020 or ENGL1025) **(BP/EP) 3 cr**

ENGL2125 TECHNICAL WRITING

This course will enhance students' abilities to write effective technical reports. Emphasis will be on effective writing styles, audience analysis, ethics, intercultural issues, documentation of sources, designing visual aides, and practicing outlining techniques to create instructions and process reports. Students also will plan, organize, complete and present a group persuasive proposal. (Prereq: Qualifying score on CPT English assessment test OR ENGL1025 or ENGL1020) **(BP/EP) 3 cr**

ENGL2130 INTRODUCTION TO CREATIVE WRITING

This introductory course will provide a broad overview of creative writing. Emphasis will be on short stories, nonfiction, memoir, playwriting, and essays. Students will study the work of published authors, complete short writing assignments, and complete a substantial creative piece in the genre of their choice. (Prereq: Qualifying score on CPT English assessment test OR ENGL1020 or ENGL1025) **(BP/EP) 3 cr**

ENHS1110 CHEMISTRY OF HAZARDOUS MATERIALS
This course will provide the student with examples of chemical and physical properties. Treatment technology for the various classes of hazardous materials and selected examples of chemical incompatibilities common to hazardous materials will be discussed. (Prereq: None)
(Hopkins Tech Center) 3 cr

ENHS1120 HAZARDOUS MATERIALS MANAGEMENT AND HANDLING
This course is designed to provide the student with information and skills required for the safe performance of daily work activities involving hazardous materials. The emphasis of this course is safe work practices. (Prereq: None)
(Hopkins Tech Center) 1 cr

ENHS1130 PERSONAL PROTECTIVE EQUIPMENT
This course is designed to provide the student with information required to select, use, maintain and safely don and doff personal protective equipment. Topics covered include equipment used for the protection of the respiratory system, head, face, hands, feet, and the body. Students will be able to determine the levels of protection based on EPA guidelines after completion of the class. (Prereq: None)
(Hopkins Tech Center) 2 cr

ENHS1140 INCIDENT MANAGEMENT FOR BUSINESS AND INDUSTRY
This course is designed to provide the student with the training and information necessary to safely respond and manage emergencies. Topics covered include incident command, pre-planning, communications, and safety. (Prereq: None) **(Hopkins Tech Center) 1 cr**

ENHS1150 HAZWOPER
This course will provide the student with training and information necessary to meet OSHA's Hazardous Waste Operations and Emergency Response 40 hour training requirement (29CFR1910.120). The objective of this course is to develop the student's ability to respond properly to releases of hazardous substances. The individual's actions will result in the protection of human health, property, and the environment. (Prereq: None) **(Hopkins Tech Center) 3 cr**

ENSL0810 READING FOR CAREER EDUCATION
This course prepares ELL students who want to enter a technical college program with an overview of the kinds of readings common in a technical college classroom. It will also address test-taking and the culture of the American classroom. This course is for ELL students with an intermediate level of English or higher. (Prereq: ESL assessment test required)
(BP/EP) 4 cr

ENSL0820 INTRO TO LISTENING AND COMMUNICATING FOR TECHNICAL STUDIES
This course prepares ELL students who want to enter a technical college program with an overview of the listening and speaking tasks required in a technical college classroom. This course is for ELL students with an intermediate level of English or higher. (Prereq: ESL assessment test required)
(BP/EP) 4 cr

ENSL0830 WRITING THROUGH TECHNOLOGY
This course combines the basics of writing with the basic computer skills needed to succeed in a technical college. The students will apply information about basic writing to use the keyboard and mouse to create, edit, save and print simple Microsoft Word documents. The student will also use the Internet to browse the web, register for classes, email instructors, and access grades. This introductory course is designed for the English Language Learner who has little or no experience with a computer or with computer vocabulary. This course is for ELL students with an intermediate level of English or higher. (Prereq: ESL assessment test required)
(BP/EP) 2 cr

ENSL0840 VOCABULARY FOR MATH, MEASUREMENT, AND MATERIALS
This introductory course is designed for the English Language Learner who has been assessed into developmental math class or needs to learn general vocabulary for a technical career. The student will learn math vocabulary and symbols that will be used in developmental math classes. Also the English measurement system, its symbols and abbreviations will be learned. General vocabulary for technical programs including shapes, and solids will be introduced. Finally, critical thinking skills for work situations will be addressed. This course is for ELL students with an intermediate level of English or higher. (Prereq: ESL assessment test required) **(BP/EP) 2 cr**

ENSL0900 U.S. CULTURE
This English course for speakers of other languages will help students develop an understanding of U.S. and Minnesota culture, and its relationship to language, school and jobs. (Prereq: ESL assessment test or instructor approval)
(BP/EP) 2 cr

ENSL0903 BEGINNING COMPUTER SKILLS FOR ESL STUDENTS
This course will introduce English as a Second Language students to very basic vocabulary, processes and uses of personal computers. (Prereq: ESL assessment test or instructor approval) **(BP/EP) 2 cr**

ENSL0905 ESL STUDY SKILLS
Students who speak English as their second language will learn study skills needed to succeed in a technical college program. (Prereq: ESL assessment test or instructor approval)
(BP/EP) 2 cr

Course Descriptions

ENSL0910 LISTEN/SPEAK 1
This entry-level class for students who speak English as their second language will emphasize understanding spoken English and help develop listening skills. (Prereq: ESL assessment test or instructor approval) **(BP/EP) 2 cr**

ENSL0912 GRAMMAR 1
This course offers an introduction to common structures of the English language. This is the first in a series of four courses. (Prereq: ESL assessment or instructor approval) **(BP/EP) 2 cr**

ENSL0915 READ/WRITE 1
This entry-level course for students who speak English as their second language will help improve basic reading, writing, grammar and vocabulary. (Prereq: ESL assessment test or instructor approval) **(BP/EP) 2 cr**

ENSL0920 LISTEN/SPEAK 2
Students who speak English as their second language will continue to develop listening and speaking skills in social, work and school settings. (Prereq: ESL assessment test or instructor approval) **(BP/EP) 2 cr**

ENSL0922 GRAMMAR 2
This is the second in a series of four courses on the structure of the English language. (Prereq: ESL assessment or instructor approval) **(BP/EP) 2 cr**

ENSL0925 READ/WRITE 2
This level two course will help students who speak English as their second language recognize and correct common writing problems and increase vocabulary through reading. (Prereq: ESL assessment test or instructor approval) **(BP/EP) 2 cr**

ENSL0930 LISTEN/SPEAK 3
Students who speak English as their second language will expand listening and speaking skills, particularly in social, work and school settings. (Prereq: ESL assessment test or instructor approval) **(BP/EP) 2 cr**

ENSL0932 GRAMMAR 3
This is the third in a series of four courses on the structure of the English language. (Prereq: ESL assessment or instructor approval) **(BP/EP) 2 cr**

ENSL0935 READ/WRITE 3
This level three course will help students who speak English as their second language review basic grammar, use the library and computer to research information and further develop reading, writing and vocabulary skills. (Prereq: ESL assessment test or instructor approval) **(BP/EP) 2 cr**

ENSL0940 LISTEN/SPEAK 4
English as a Second Language students who are at a high intermediate level will use paired and group conversation to increase their listening and speaking skills. (Prereq: ESL assessment test or instructor approval) **(BP/EP) 2 cr**

ENSL0942 GRAMMAR 4
This is the fourth in a series of four courses on the structure of the English language. (Prereq: ESL assessment or instructor approval) **(BP/EP) 2 cr**

ENSL0945 WRITING 4
English as a Second Language students at level 4 will continue to use previously learned writing skills to refine their writing. (Prereq: ESL assessment test or instructor approval) **(BP/EP) 2 cr**

ENSL0950 TECHNICAL VOCABULARY FOR ESL STUDENTS
This course will help the intermediate ESL student identify technical equipment and tools and learn technical vocabulary. (Prereq: ESL assessment test or instructor approval) **(BP/EP) 2 cr**

ENSL0955 READING 4
English as a Second Language students at level 4 will build on previously learned reading skills to further develop their reading comprehension and speed. (Prereq: ESL assessment or instructor approval) **(BP/EP) 2 cr**

ENSL0965 PRONUNCIATION I
Correct pronunciation can be one of the most difficult aspects of the English language for speakers of other languages to master. Poor pronunciation can also greatly hinder communication. This course provides a systematic presentation of American English pronunciation: theory and practice. This is the first course in a series of two courses. (Prereq: ESL assessment test or instructor approval) **(EP) 2 cr**

ENSL0970 PRONUNCIATION II
This course is a continuation of Pronunciation I. A systematic presentation of American English pronunciation, continued. (Prereq: ENSL0965 or ESL assessment test or instructor approval) **(EP) 2 cr**

ENSL0980 ESL CAREER EXPLORATION
This course will give ESL students information and experiences to help them make informed career choices. (Prereq: ESL level 3 or 4 or instructor approval) **(EP) 2 cr**

FDAS1200 FORD ELECTRICAL SYSTEMS
This course is designed to introduce the student to basic electrical theory and Ford electrical systems. Included in the course will be Ohm's law and an in-depth study of Ford electrical systems. (Prereq: None) **(BP) 3 cr**

FDAS1250 FORD GASOLINE ENGINE PERFORMANCE I
The purpose of this course is to provide the student with the knowledge and experience necessary to properly service today's computer controlled and conventional ignition systems as used on late model Ford vehicles. (Prereq: None) **(BP) 2 cr**

FDAS1260 FORD GASOLINE ENGINE PERFORMANCE II
This course is designed to teach the student how the engine systems work together to provide superb engine performance while maintaining fuel economy and reducing emission. (Prereq: FDAS1250) **(BP) 3 cr**

FDAS1300 RELATED MECHANICAL SKILLS
This course will detail the information of measuring with precision instruments. It will also give the student the fundamentals of body part replacement and alignment on Ford vehicles. (Prereq: None) **(BP) 1 cr**

FDAS1400 CLUTCHES/DIFFERENTIALS
This course will detail the fundamentals, operation and repair of the clutch and differential used on Ford vehicles. (Prereq: None) **(BP) 2 cr**

FDAS1410 MANUAL TRANSMISSION/TRANSAXLE
This course will detail the fundamentals, operation and repair of the manual transmission and the manual transaxle used on Ford vehicles. (Prereq: None) **(BP) 2 cr**

FDAS1500 BASIC ENGINES
This course will detail the fundamentals, operations and repair of gasoline/diesel engine blocks on Ford vehicles. (Prereq: None) **(BP) 3 cr**

FDAS1550 ENGINE REPAIR
This course will detail the fundamentals, operations and repair of cylinder heads on Ford vehicles. (Prereq: None) **(BP) 2 cr**

FDAS1600 FORD SUSPENSION SYSTEMS
This course will detail the different types of suspension and steering systems used on Ford vehicles. It will cover diagnosis of problems and repairing the systems. (Prereq: None) **(BP) 2 cr**

FDAS1610 NOISE VIBRATION HARSHNESS
This course will address the common noise vibration and harshness conditions that today's modern automotive technician will encounter. (Prereq: None) **(BP) 2 cr**

FDAS1650 FORD STEERING
In this course the student will analyze the steering systems used on both "off-shore" and domestic Ford vehicles. The student will learn to troubleshoot, diagnose and repair steering systems using a hands-on approach with late model Ford vehicles. (Prereq: None) **(BP) 2 cr**

FDAS1701 FORD CLIMATE CONTROL
This course is designed to equip the student with a basic technical knowledge of air conditioning systems used on Ford Motor Company cars and light trucks. (Prereq: None) **(BP) 3 cr**

FDAS1750 FORD FUEL SYSTEMS
This course will detail the fundamentals, operation and repair of Ford fuel systems. (Prereq: None) **(BP) 2 cr**

FDAS1810 FORD DEALERSHIP INTERNSHIP I
This course will provide the student on-the-job training in a Ford or Lincoln-Mercury dealership. The student will use knowledge learned during previous courses and put into practice the technical skills learned on customers' vehicles. (Prereq: None) **(BP) 6 cr**

FDAS1820 FORD DEALERSHIP INTERNSHIP II
This course will provide the student on-the-job training in a Ford or Lincoln-Mercury dealership. The student will use knowledge learned during previous courses and put into practice the technical skills learned on customers' vehicles. (Prereq: None) **(BP) 6 cr**

FDAS2030 FORD DEALERSHIP INTERNSHIP III
This course will provide the student on-the-job training in a Ford or Lincoln-Mercury dealership. The student will use knowledge learned during previous courses and put into practice the technical skills learned on customers' vehicles. (Prereq: None) **(BP) 6 cr**

FDAS2040 FORD DEALERSHIP INTERNSHIP IV
This course will provide the student on-the-job training in a Ford or Lincoln-Mercury dealership. The student will use knowledge learned during previous courses and put into practice the technical skills learned on customers' vehicles. (Prereq: None) **(BP) 6 cr**

FDAS2052 FORD DEALERSHIP INTERNSHIP V
This course will provide the student on-the-job training in a Ford or Lincoln-Mercury dealership. The student will use knowledge learned during previous courses and put into practice the technical skills learned on customers' vehicles. (Prereq: None) **(BP) 9 cr**

FDAS2230 FORD CAR TRANSMISSIONS
This course will detail the fundamentals, operation and repair of automatic transmissions used on current Ford passenger cars. (Prereq: None) **(BP) 3 cr**

FDAS2240 FORD TRUCK TRANSMISSIONS
This course will detail the fundamentals, operation and repair of the automatic transmissions used on current Ford light trucks. (Prereq: None) **(BP) 3 cr**

FDAS2501 FORD ADVANCED ENGINE PERFORMANCE
This course will detail the fundamentals of EEC certification and a written and hands-on test will be administered by a Ford engineer. (Prereq: None) **(BP) 2 cr**

FDAS2551 FORD DIESEL
This course will address the unique characteristic of diesel fuel and fast glow plug systems. Operations, diagnostic and repair of diesel fuel systems components are covered as well as proper use of special diesel diagnostic tools and equipment. (Prereq: None) **(BP) 3 cr**

Course Descriptions

FDAS2600 FORD BRAKING SYSTEMS
This course will detail the brake systems of Ford Motor Company cars and light trucks and will cover diagnosis of problems and repairing the systems. (Prereq: None) **(BP) 3 cr**

FLPW1101 FLUID POWER TECHNOLOGY I
This course considers the basic fundamentals of hydraulics and pneumatics. The operating principles of basic systems used in industry today will be emphasized. Persons involved with machine maintenance, production automation, packaging, plastics, mechanical drafting and engineering technologies should consider this course. (Prereq: None) **(BP/EP) 3 cr**

FLPW1106 FLUID POWER TECHNOLOGY II
This course considers the principles of hydraulics and pneumatics. The operating principles of basic systems used in industry will be emphasized. Fluid power terms, definitions, symbols and liquid principles will be discussed. Standards, engineering specifications and interchangeability will also be discussed in-depth. Persons involved with machine design, drafting, maintenance, production, automation, packaging, plastics and engineering technologies should consider this course. (Prereq: FLPW1101 or concurrent) **(BP/EP) 4 cr**

FLPW1150 PNEUMATIC COMPONENTS
This course is the study of the function and application of air compressors, vacuum pumps, air motors, cylinders, limited rotation actuators, directional valves, pressure and flow control valves used in industrial systems today. Various compressor designs will be discussed and inspected for wear. Students will use precision measuring tools and identify overhaul procedures for various components. The pneumatic power circuit and the "how to test" an operating system will be covered. Persons involved with machine design, drafting, maintenance, production, automation, packaging, plastics and engineering technologies should consider this course. (Prereq: None) **(BP/EP) 4 cr**

FLPW1181 PUMPS, ACTUATORS, AND CONDUCTORS
This course is a study of the function and application of hydraulic pumps, motors, cylinder and hydraulic accessories. Industrial hydraulic components and their application will be emphasized. Persons involved with machine maintenance, production automation, packaging, plastics, mechanical drafting and engineering technologies should consider this course. (Prereq: FLPW1101) **(BP/EP) 4 cr**

FLPW1191 HYDRAULIC COMPONENTS
This course is an in-depth study of hydraulic components. Troubleshooting, repairing and testing of pressure control, direction control and flow control valves will be covered. Persons involved in maintenance, manufacturing or engineering technologies should consider this course. (Prereq: FLPW1101) **(BP/EP) 3 cr**

FLPW1231 INDUSTRIAL ELECTRICITY I
This course is a study of the terms, symbols, definitions and safety practices related to industrial electricity. The student will calculate volts, ohms, watts and power in industrial electricity. The student will be able to wire simple AC circuits, utilize volt-ohm meter. Diagnose circuit problems and determine circuit operations from a two-line diagram. Persons involved with machine design, drafting, maintenance, production, automation, packaging, plastics and fluid power engineering technologies should consider this course. (Prereq: None) **(BP/EP) 3 cr**

FLPW1236 INDUSTRIAL ELECTRICITY II
This course is designed for the individual working in plant maintenance, machine upgrading, automated packaging, hydraulics or pneumatics. The student will wire electrical circuits using transformers, control relays, pressure switches, timers, motor starters and contractors. The student will practice troubleshooting techniques on electrical panels. Upon completion the student will be able to test and diagnose basic industrial electrical circuits. (Prereq: FLPW1231) **(BP/EP) 3 cr**

FLPW1320 HYDRAULIC CIRCUITS
This course will cover set up and testing of industrial and mobile circuits from a given schematic. The construction and operation of circuits will provide experience in troubleshooting electro-hydraulic machines and construction equipment. Routine maintenance will also be discussed. (Prereq: FLPW1101) **(BP/EP) 2 cr**

FLPW1340 PNEUMATIC CIRCUITS AND AIR LOGIC
Students will construct pneumatic circuits which will provide practical knowledge of component identification and circuit construction. The student will gain experience connecting, troubleshooting and maintaining pneumatic components and circuits. (Prereq: FLPW1101 or concurrent and FLPW1150) **(BP/EP) 4 cr**

FLPW2000 PROGRAMMABLE LOGIC CONTROLLERS
This is an introduction to the world of programmable logic controllers. The student will learn the basics of how to program and set up a PLC. The student will also learn the different addressing and programming styles and be challenged to write a program for a simple machine. Various PLCs will be discussed. Persons involved with fluid power, automated machinery, electronics, machine design and modifications should consider this course. (Prereq: None) **(BP/EP) 3 cr**

FLPW2020 ADVANCED PROGRAMMABLE LOGIC CONTROLLERS

This course is a continuation of Programmable Logic Controllers (PLC) and is designed to give the student a more in-depth working knowledge of the PLC. Advanced programming, troubleshooting and application techniques will be covered. Students will take projects from the design process to the implementation of their design. The projects include: software generated programs, various use of digital and analog input and output devices, field wiring diagrams, machine sequence diagrams and PLC component selection. Students will interface the Allen Bradley PLC with various types of machine and motor controllers including AC and DC devices. (Prereq: FLPW2000 or equivalent or instructor approval) **(BP) 3 cr**

FLPW2112 INSTRUMENTATION OF FLUID POWER SYSTEMS (INDUSTRIAL OR AUTOMATED MACHINES)

This course will cover the skills needed to instrument and test a fluid power system. Instrumentation measurement will include pressure, flow, torque, force, RPM, velocity, vibration and sound. The student will use a volt-ohm meter to set excitation voltage, determine null and output levels of each type of transducer used to instrument an industrial or automated machine. The student will set and calibrate instruments such as strain gauges, thermocouples and temperature measuring devices, RPM and GPM transducers. The signal conditioning/amplifier devices for digital and analog will be covered in this course. Persons involved with machine design, maintenance, packaging, beverage and food processing and fluid power engineering should consider this course. (Prereq: FLPW1231 should be taken prior to or concurrent with this course) **(BP/EP) 3 cr**

FLPW2180 CIRCUIT DESIGN

This course will introduce the student to basics in the selection of hydraulic components, proper circuit design techniques and tools to help solve common application problems. Common hydraulic components such as pumps, motors and valves will be thoroughly explained, along with proper applications and sizing techniques. Circuits and components related to both mobile and industrial applications will be discussed. Upon completion of this course, the student will be able to design and plumb simple hydraulic circuits involving fixed and variable pumps, pressure control circuits and speed control circuits. The student will also have a better understanding of systems which will increase the ability to troubleshoot existing equipment and determine solutions to problems. This course is intended for hydraulic sales personnel, plant engineers, design engineers, service technicians and drafting and fluid power students. (Prereq: FLPW1106) **(BP/EP) 3 cr**

FLPW2191 INDUSTRIAL CIRCUIT DESIGN

This course combines all the curricula in the Fluid Power Technology program. A complete industrial circuit will be developed. A complete schematic will be developed for the hydraulic, pneumatic, electrical and mechanical systems. You will select, pump and actuators will be sized and valves will be specified. A Bill of Materials is developed. Creativity will be utilized to design efficient, safe and economical circuits. This course is intended for individuals involved with design of production machines, automated systems, food processing or harvesting equipment. Individuals involved in the specifications of hydraulic and pneumatic components should consider this course. (Prereq: FLPW1106 and FLPW1231) **(BP/EP) 3 cr**

FLPW2250 PROPORTIONAL AND SERVO CONTROLS (ROBOTICS APPLICATION)

This course will include setting up and operating various types of open loop and closed loop servo systems. Emphasis will be placed on control and feedback devices as they are used in automated and robotics applications. (Prereq: FLPW1106) **(BP/EP) 3 cr**

FLPW2301 MOBILE CIRCUIT DESIGN

This course combines the Fluid Power curricula dealing with components and circuits used on mobile equipment. The various power steering circuits will be discussed. The current state-of-art hydrostatic drives will be investigated and developed as part of a system design. A complete schematic will be developed for the hydraulic drives circuit, power steering and accessories. You will determine engineering specifications, select the components, pump and actuators. A Bill of Materials is developed. This course is intended for individuals involved with service and design of off road mobile equipment. (Prereq: FLPW1320) **(BP/EP) 3 cr**

FLPW2321 SYSTEM ENGINEERING PORTFOLIO

This course is designed to allow the student to practice all of the principles learned in the fluid power curricula. The student will work with the instructor and industry to design a project integrating electrical, mechanical, hydraulic, and pneumatics. The student will develop a concept, the schematics, bill of materials and operating manuals for a major portfolio project. The students may work in teams with other manufacturing majors. Communication skills verbal, written and electronic will be emphasized. Teams will evaluate merits of projects and decide which projects should be further explored and fabricated. Hydraulic, pneumatic, electrical, mechanical and electronic systems will be interfaced. (Prereq: FLPW1231, FLPW1340, FLPW2112, FLPW2180, FLPW2191, and FLPW2301 or instructor approval) **(BP/EP) 3 cr**

FLPW2350 HYDRAULIC SPECIALIST CERTIFICATION REVIEW

This two-credit course is designed to prepare and review for the national Fluid Power Specialist Certification test. There will be a study guide with many practice problems to solve along with lecture time. It is intended for an individual who has two years of technical training or adequate industrial experience. Areas to be covered will include individual hydraulic and pneumatic components, air logic, proportional and servo valves, physics, circuit design, troubleshooting, instrumentation, sound measurement, electricity and conductors. (Prereq: None) **(BP/EP) 2 cr**

FLPW2360 PNEUMATIC SPECIALIST CERTIFICATION REVIEW

This course is designed to prepare and review for the national Pneumatic Specialist Certification test. There will be a study guide with many practice problems to solve along with lecture time. It is intended for an individual who has two years of technical training or adequate industrial experience and/or mechanical engineering background. Areas to be covered will include individual hydraulic and pneumatic components, air logic, proportional and servo valves, physics, circuit design, troubleshooting, instrumentation, sound measurement, electricity and conductors. (Prereq: None) **(BP/EP) 2 cr**

FLPW2400 FLUID POWER MECHANIC INTERNSHIP

This course is an individualized internship at a mobile or industrial site. Students participate on-site with professionals in the assembly, repair or modification of industrial equipment. Students are evaluated by predetermined curriculum objectives agreed upon by the employer, instructor and student. The main focus of this course is to acquire on-the-job experience in a variety of positions. The student must interview for and acquire an internship site.
(Prereq: Complete a minimum of 15 credits in the technical core of the fluid power curriculum and instructor approval)
(BP/EP) 1-6 cr

FRPT1100 FIRE FIGHTER I

This course is designed to teach the student the necessary skills to perform the base duties of fire fighting including the thought process used to decide the operations to do. This will include the duties of rescue, exposure protection, confinement of the fire, extinguishment of the fire, overhaul, salvage and ventilation. (Prereq: Physical exam and Lung Function Exam (OSHA 1910.134)) **(Hopkins Tech Center) 5 cr**

FRPT1105 FIRE FIGHTER II

This course is designed to teach the student the skills necessary to perform the basic duties of fire fighting, including the thought process used to decide on appropriate operations. This will include specialized rescue, building construction and fire cause determination.
(Prereq: FRPT1100) **(Hopkins Tech Center) 2 cr**

FRPT1110 FIRE INSTRUCTOR BASIC

This course is designed to teach individuals entering into teaching or instructing situations the basic skills necessary to function effectively in a classroom or drill ground setting.
(Prereq: None) **(Hopkins Tech Center) 2 cr**

FRPT1115 COMPANY FUNCTIONS

This course is designed to meet the needs of fire officers and crew leaders with responsibilities to manage the operations of none or more companies in structural firefighting operations. The course components of this curriculum include preparation for response, decision making, and tactical operations. The foundation of the course is an extensive use of simulation to provide application of concepts and the development of skill.
(Prereq: None) **(Hopkins Tech Center) 2 cr**

FRPT1120 LINE OFFICER BASIC

This course is designed to meet the needs of the company officer; this course of leadership provides the participant with basic skills and tools needed to perform effectively as a leader in the fire service environment. This course addresses techniques and approaches to problem solving, identifying and assessing the needs of the officer's company subordinates, running meetings effectively in the fire service environment, and decision making for the company officer. (Prereq: None)
(Hopkins Tech Center) 2 cr

FRPT1125 FIRE INVESTIGATION BASIC

This course is designed to teach the student the basic skills needed for fire investigations. (Prereq: None)
(Hopkins Tech Center) 2 cr

FRPT1130 FIRE INSPECTOR BASIC

This course is designed to teach the student the basic skills needed to conduct fire inspections. The student will learn basic code usage, basic inspection practices and insights on how to work with the public on fire prevention activities.
(Prereq: None) **(Hopkins Tech Center) 2 cr**

FRPT1136 INTRODUCTION TO FIRE PROTECTION

This course is designed to introduce the student to the systems approach to fire protection by presenting the system components of modern fire department responsibility, including suppression, prevention, public education, emergency medical service, hazardous materials response and urban search and rescue. Other concepts emphasized are incident effectiveness, customer service, physical fitness and training, and fire prevention. (Prereq: None)
(Hopkins Tech Center) 2 cr

FRPT1140 FIRE DEPARTMENT ADMINISTRATION BASIC

This course is designed to give the student skills necessary to organize and manage a municipal fire department. The student will understand interdepartmental relationships, city government, and fire department organization, and will learn basic administrative skills. (Prereq: None)
(Hopkins Tech Center) 2 cr

FRPT1150 INCIDENT MANAGEMENT
This course is designed to enhance the student's incident management skills. Areas to be covered are emergency fireground management, management of natural and technological disasters and an introduction to emerging management principles. The student will learn concepts of incident command, pre-planning, communications and safety, along with the Minnesota Incident Management System. (Prereq: FRPT1115 and FRPT2110)
(Hopkins Tech Center) 2 cr

FRPT1155 FIRE SPRINKLER DESIGN AND APPLICATION
This course will teach the student how to review built-in fire protection system design. The student will learn about portable extinguishers, fixed special agent systems, water supply and sprinkler systems. (Prereq: None)
(Hopkins Tech Center) 2 cr

FRPT1161 BUILDING CONSTRUCTION FOR THE FIRE SERVICE
This course is designed to teach the student the principles used in constructing various types of buildings. The student will learn the basic principles used and types of construction found in the U.S. The curriculum follows the standards set by NFPA 1001 - Fire Fighter II and NFPA 1021 - Fire Officer. (Prereq: None) **(Hopkins Tech Center) 3 cr**

FRPT1165 APPARATUS OPERATOR
This course is designed to provide knowledge of pumping apparatus design and standard requirements for performance. The student will learn about the mechanical workings of fire pumps and the accessories required to use the pumps. It will introduce the student to apparatus maintenance and necessary record keeping. The student will also develop attitudes and skills necessary for safe driving and operation of a pumper. This course will introduce the student to the hydraulics used on the fire ground and will give the student knowledge about the characteristics of water, laws of physics and water systems. The student will gain the knowledge and skills necessary to set up and flow water using an aerial device. This course follows the NFPA 1002 Standard for apparatus operators. (Prereq: None) **(Hopkins Tech Center) 3 cr**

FRPT1175 HAZARDOUS MATERIALS FIRST RESPONDER OPERATIONAL
This course is designed to teach the necessary skills to protect yourself, your fellow responder and the public from exposure in a hazardous materials incident. The course meets the requirements of the OSHA 1910.120 for the First Responder Operation level. The student will learn how to recognize and identify the presence of hazardous materials, the proper protective clothing to use, how to decontaminate properly, how to establish an Incident Command System and the proper standard operating procedures to maintain safety at the incident scene. The course follows the NFPA Standard 472 requirements for the First Responder Operational level. (Prereq: None) **(Hopkins Tech Center) 3 cr**

FRPT1180 HAZARDOUS MATERIALS TECHNICIAN
This course is designed to teach the necessary skills to protect yourself, your fellow responder and the public from exposure in a hazardous materials incident. The course meets the requirements of the OSHA 1910.120 for the level of Technician. The student will learn how to identify the presence of hazardous materials, the proper protective clothing to use, how to decontaminate properly, how to establish an Incident Command System and the proper standard operating procedures to maintain safety at the incident scene. The student will also learn physical mitigation activities. The course follows the NFPA Standard 472 requirements for Technician. (Prereq: FRPT1175 or instructor approval) **(Hopkins Tech Center) 3 cr**

FRPT2105 FIRE INSTRUCTOR ADVANCED
This course is designed to provide individuals entering into situations which require planning for teaching or instructing with some of the advanced skills necessary to oversee a classroom or drill ground setting. The student will learn the role of the instructor, to identify various learning styles and develop instructional materials, and will demonstrate the ability to deliver instruction and evaluate student learning. (Prereq: FRPT1110) **(Hopkins Tech Center) 2 cr**

FRPT2110 FIRE GROUND CONTROL
This course is designed to teach the student the components of the Fireground Command System and how they relate to controlling a fire ground. This system was developed by the Phoenix Fire Department. The student will learn standard operating procedures and how they relate to the functions of the command. (Prereq: None) **(Hopkins Tech Center) 2 cr**

FRPT2115 LINE OFFICER ADVANCED
This course is designed to meet some of the Fire Officer II responsibilities laid out in the NFPA 1021 standards. These areas include basic management and leadership skills. This course also familiarizes the student with the National Fire Incident Reporting System and how to properly enter incident report information into the system. (Prereq: FRPT1120 or instructor approval) **(Hopkins Tech Center) 2 cr**

FRPT2120 FIRE INVESTIGATION ADVANCED
This course is designed to teach the student the basic skills needed for fire investigations. The student will learn basic insurance concerns, photography, use of sketching devices, investigative techniques, and characteristics of wildland fires, vehicle fires and fatal fires. The student will learn about explosives, incendiary, legal aspects, interviews, field notes and report writing. (Prereq: FRPT1125 or instructor approval) **(Hopkins Tech Center) 2 cr**

FRPT2125 FIRE INSPECTOR ADVANCED
This course is designed to give the student an understanding of modern fire prevention activities. The student will learn advanced code usage and advanced inspection practices, and gain insight on how to work with the public.
(Prereq: FRPT1130 or instructor approval)
(Hopkins Tech Center) 2 cr

FRPT2135 FIRE DEPARTMENT ADMINISTRATION ADVANCED

This course is designed to teach the student planning and management techniques used by a fire department administrator. The student will learn about budgeting, personnel and communication procedures, and planning and decision-making techniques. (Prereq: None) **(Hopkins Tech Center) 3 cr**

FRPT2140 MANAGING FIRE DEPARTMENT PERSONNEL

This course will give the student skills in personnel practices and management procedures. The student will learn concepts of collective bargaining, binding arbitration, promotional procedures and career incentive plans. (Prereq: None) **(Hopkins Tech Center) 3 cr**

FRPT2200 HAZARDOUS MATERIALS SPECIALTY SAFETY OFFICER

This course is designed to teach the necessary skills to protect yourself, your fellow responders and the public from exposure in a hazardous materials incident. The course meets the requirements of the OSHA 1910.120 for the level of Specialist. It follows the requirements set out in NFPA Standard 472. The student will learn how to identify the presence of hazardous materials, the proper protective clothing to use, how to decontaminate properly, how to establish an Incident Command System and the proper standard operating procedures to use to maintain safety at the incident scene. (Prereq: FRPT1180 or instructor approval) **(Hopkins Tech Center) 1 cr**

FRPT2205 HAZARDOUS MATERIALS SPECIALTY HAZARD SECTOR OFFICER

This course is designed to teach the necessary skills to protect yourself, your fellow responders and the public from exposure in a hazardous materials incident. The course meets the requirements of the OSHA 1910.120 for the level of Specialist. It follows the requirements set out in NFPA Standard 472. The student will learn how to identify the presence of hazardous materials, the proper protective clothing to use, how to decontaminate properly, how to establish an Incident Command System and the proper standard operating procedures to use to maintain safety at the incident scene. (Prereq: FRPT1180 or instructor approval) **(Hopkins Tech Center) 1 cr**

FRPT2210 SPECIALIZED MONITORING

This course is designed to give the student the knowledge to perform monitoring activities at a hazardous material incident (spill) scene in order to maintain safety and set up site control measures. The emphasis is on the direct read instruments. This course consists of instructor-directed study and problem solving using simulation. (Prereq: FRPT1180 or instructor approval) **(Hopkins Tech Center) 1 cr**

FRPT2215 HAZARDOUS MATERIALS SPECIALTY CONTAINERS

This course is designed to give the student the knowledge to perform container analysis activities at a hazardous material incident (spill) scene in order to maintain safety and set up site control measures. The course covers both fixed and mobile containers. This course consists of instructor-directed study and problem solving using simulation. (Prereq: FRPT1180 or instructor approval) **(Hopkins Tech Center) 1 cr**

FRPT2220 HAZARDOUS MATERIALS SPECIALTY FLAMMABLES - SOLIDS, LIQUIDS, GASES

This course is designed to teach the necessary skills to protect yourself, your fellow responders and the public from exposure in a hazardous materials incident. The course meets the requirements of the OSHA 1910.120 for the level of Specialist. The course follows the NFPA Standard 472. The student will learn how to identify the presence of hazardous materials, the proper protective clothing to use, how to decontaminate properly, how to establish an Incident Command System and the proper standard operating procedures to use to maintain safety at the incident scene. (Prereq: FRPT1180 or instructor approval) **(Hopkins Tech Center) 1 cr**

FRPT2225 HAZARDOUS MATERIALS SPECIALTY CORROSIVE AND TOXIC

This course is designed to teach the necessary skills to protect yourself, your fellow responders and the public from exposure in a hazardous materials incident. The course meets the requirements of the OSHA 1910.120 for the level of Specialist. The course follows the NFPA Standard 472. The student will learn how to identify the presence of hazardous materials, the proper protective clothing to use, how to decontaminate properly, how to establish an Incident Command System and the proper standard operating procedures to use to maintain safety at the incident scene. (Prereq: FRPT1180 or instructor approval) **(Hopkins Tech Center) 1 cr**

FRPT2230 HAZARDOUS MATERIALS SPECIALTY POISONS, RADIOACTIVES AND EXPLOSIVES

This course is designed to teach the necessary skills to protect yourself, your fellow responders and the public from exposure in a hazardous materials incident. The course meets the requirements of the OSHA 1910.120 for the level of Specialist. The course follows the NFPA Standard 472. The student will learn how to identify the presence of hazardous materials, the proper protective clothing to use, how to decontaminate properly, how to establish an Incident Command System and the proper standard operating procedures to use to maintain safety at the incident scene. (Prereq: FRPT1180 or instructor approval) **(Hopkins Tech Center) 1 cr**

FRPT2235 SPECIALTY MITIGATION I
This course is designed to give the student the knowledge to perform mitigation activities at a hazardous material incident (spill) scene in order to control the flow or movement of the hazardous material. The emphasis is on following safe work practices. This course consists of instructor-directed study and problem solving using simulation. (Prereq: FRPT1180 or instructor approval) **(Hopkins Tech Center) 1 cr**

FRPT2240 SPECIALTY MITIGATION II
This course is designed to give the student the knowledge to perform mitigation activities at a hazardous material incident (spill) scene in order to control the flow or movement of the hazardous material. The emphasis is on following safe work practices. This course consists of instructor-directed study and problem solving using simulation. (Prereq: FRPT1180 or instructor approval) **(Hopkins Tech Center) 1 cr**

GTEC1111 CHARACTERISTICS OF NATURAL GAS
In this course students will identify characteristics and hazards of natural gas. Students will learn to recognize potential ignition sources: indoor and outdoor. Students will also learn to recognize and report natural gas leaks and how to recognize emergency conditions. They will also learn power tool safety, proper firefighting techniques, and how to use personal protective equipment. Controlling the accidental release of gas will also be introduced. (Prereq: None) **(BP) 5 cr**

GTEC1121 LEAK CLASSIFICATION
In this course students will learn how to recognize unsafe meter sets and leak classifications. Students are also introduced to the operation of the combustible gas indicator and the flame ionization unit. Carbon monoxide testing and emergency response and restoration of service will also be covered. Fundamentals of welding and welding safety are also introduced. Beginning with this course and continuing through the rest of the program the students will be entering the Mentor program where they will spend part of their time working with field personnel. (Prereq: GTEC1111) **(BP) 5 cr**

GTEC1130 LEAK INVESTIGATION
In this course students will learn to identify odorization. Students will also learn to perform Bar Hole testing and purging. Students will gain knowledge in the investigation of customer leaks and also leak surveys and patrols. Students will continue working with field personnel in the Mentor program. (Prereq: GTEC1120) **(BP) 4 cr**

GTEC1201 GAS APPLIANCES/ELECTRICITY
Students will learn safe practices while working with electrical sources/circuits in gas appliances. The students will gain knowledge of test equipment, reading wiring diagrams, and the functions of gas/electrical controls. Students will also be trained in combustion and ventilation air, gas air adjustment, and venting properly. They will also study lighting appliances, pilot lights and ignition systems. Sequence of operation and troubleshooting will also be covered. (Prereq: None) **(BP) 2 cr**

GTEC1210 PIPE JOINING, EXCAVATION AND SHORING
This course will introduce students to job-site protection procedures. The course will focus on excavation and shoring safety. The students will also cover plastic pipe fusion, joining steel pipes,a and pressure testing steel and plastic pipelines. Students will continue working with field personnel in the Mentor program. (Prereq: GTEC1130) **(BP) 4 cr**

GTEC1221 INSTALLING MAINS AND SERVICES
In this course the students will be trained in tapping/stopping 1.25" though 4" pipe. Also covered will be crossings, plastic pipe repair, and installing mains and services. Students will continue working with field personnel in the Mentor program. (Prereq: GTEC1210) **(BP) 5 cr**

GTEC1231 REGULATION
Students will learn the maintaining of steel and cast iron mains and the reinforcing of steel and plastic mains. Students will also become skilled at inspecting and maintaining valves and inspecting pressure regulating and limiting stations. Abandoning facilities and system uprating will also be included in this course. Students will continue working with the field personnel in the Mentor program. (Prereq: GTEC1221) **(BP) 5 cr**

HLUC1001 HEALTH UNIT COORDINATOR FUNDAMENTALS
This course will introduce the student to the health care environment, plus health unit coordinator procedures. The student will become familiar with ethical and legal standards, nursing unit references, chart forms, graphing vital signs, processing patient chart, beginning transcription procedures, communication and interpersonal relations. (Prereq: None) **(BP) 3 cr**

HLUC1020 MEDICAL TERMINOLOGY
This course is designed to acquaint the student with medical terminology, abbreviations and basic anatomy. Students learn to pronounce and spell terminology related to diseases, diagnosis and other related medical terms. They will also learn abbreviations related to diseases, diagnosis and nursing treatments. (Prereq: None) **(BP) 2 cr**

HLUC1040 BASIC PHARMACOLOGY
This course is designed to acquaint the student with drug categories and medications commonly used in the hospitals and nursing homes. This knowledge will enable the student to understand various medication orders. (Prereq: None) **(BP) 1 cr**

HLUC1060 DIAGNOSTIC AND THERAPEUTIC PROCEDURES
This course is designed to acquaint the student with diagnostic tests and procedures. The student will become familiar with various laboratory and diagnostic imaging procedures, including patient preparation requirements. The course will include background information relating to physicians orders and an introduction to order transcription. (Prereq: HLUC1001, HLUC1020 and HLUC1040) **(BP) 2 cr**

Course Descriptions

HLUC1100 PROCESSING PHYSICIAN'S ORDERS

This course is designed to give the student the skills needed in transcribing physician's orders. It will include transcribing medication and IV orders, admission orders, lab and x-ray orders, treatment orders, diet and activity orders, preoperative orders and post-operative orders. Computer transcription will also be introduced. In addition, the student will be provided the opportunity to read many variations of handwritten physicians orders. This will include reading and transcribing complex gynecology, orthopedic, diabetic, neurology and respiratory orders. (Prereq: HLUC1060) **(BP) 3 cr**

HLUC1120 EXPANDED HUC ROLE

This course is designed to explain the expanded role of the health unit coordinator. As new technology and trends in health care develop, the tasks for the health unit coordinator become more complex. This student will become familiar with insurance claims and coding, management techniques, leadership issues, communicable diseases and advance directives. The student will be expected to write a paper on an emerging, new health care trend. (Prereq: None) **(BP) 2 cr**

HLUC1140 HUC CERTIFICATION TEST REVIEW

This course is designed to prepare the student for the HUC Certification Test. It will include a review of medical terminology, abbreviations and pharmacology. It will also include a review of the patient's chart, transcription of doctor's orders and communication techniques. (Prereq: Completion of or concurrent enrollment in HLUC courses and instructor approval) **(BP) 1 cr**

HLUC1200 HEALTH UNIT COORDINATOR INTERNSHIP

This is a cooperative training program between Hennepin Technical College and a health care facility which allows the student to apply competencies learned in the program to an employment-like work experience. The student will be assigned to a specific nursing unit in a hospital or nursing home and will be expected to perform various HUC duties. (Prereq: Completion of or concurrent enrollment in the Health Unit Coordinator courses and instructor approval) **(BP) 3 cr**

HVAC1000 ELECTRICAL CIRCUITS

This course is designed to introduce the student to the fundamentals of direct current and alternating current circuits. Meter usage, circuit computations, and troubleshooting will also be covered. (Prereq: HVAC1020) **(BP/EP) 3 cr**

HVAC1010 1PH MOTORS AND AUXILIARY CONTROLS

This course covers the basic fundamentals of motors. This course will also teach the student to maintain, operate and service motors and auxiliary controls. (Prereq: HVAC1020) **(BP/EP) 2 cr**

HVAC1020 TUBE AND PIPE FABRICATION

This course will introduce the student to the basic techniques involved in tube and pipe fabrication. This course also introduces the student to industrial safety practices. (Prereq: None) **(BP/EP) 2 cr**

HVAC1030 SHEET METAL

This course will introduce the skills required to assemble duct work for air distribution in heating and air conditioning systems. (Prereq: None) **(BP/EP) 2 cr**

HVAC1040 BASIC REFRIGERATION

This course will expose the student to the basic physical laws relating to refrigeration systems components, refrigeration theory, the refrigeration cycle and system operation. (Prereq: HVAC1020) **(BP/EP) 4 cr**

HVAC1050 REFRIGERANT TRANSITION AND RECOVERY

This course provides the information required to prepare students for EPA Refrigerant Transition and Recovery Certification. The certification examination will be administered upon completion of this training. (Prereq: None) **(BP/EP) 1 cr**

HVAC1055 REFRIGERATION CERTIFICATION EXAM

This examination is certified by the EPA and packaged by ESCO Institute. (Prereq: HVAC1050 or knowledge of HVAC systems operations) **(BP/EP) 0 cr**

HVAC1070 GAS HEAT SYSTEMS

This course will provide the student with the skills needed for combustion and efficiency testing, troubleshooting and good ventilation practices involved with warm air heating systems. (Prereq: HVAC1000) **(BP/EP) 3 cr**

HVAC1081 OIL HEAT SYSTEMS

This course will aid the student in developing skills for troubleshooting and servicing high pressure gun-type burners, primary controls and warm air system operation. (Prereq: None) **(BP/EP) 1 cr**

HVAC1110 ELECTRICAL DIAGRAMS

This course is designed to introduce the student to the fundamentals of electrical control circuitry, including the development of schematic and ladder diagrams and point-to-point wiring exercises. (Prereq: HVAC1020) **(BP/EP) 2 cr**

HVAC1120 PSYCHROMETRICS

This course will introduce the student to the fundamentals of air properties. (Prereq: None) **(BP/EP) 1 cr**

HVAC1130 ROOM AIR CONDITIONERS

This course will introduce the skills for troubleshooting and servicing room air conditioners. (Prereq: HVAC1000 and HVAC1040) **(BP/EP) 2 cr**

HVAC1140 CENTRAL AIR CONDITIONERS

This course will assist the student in developing skills for installing, troubleshooting and servicing central air conditioners. (Prereq: HVAC1000 and HVAC1040) **(BP/EP) 3 cr**

HVAC1145 HEAT PUMPS

This course will assist the student in developing skills for installing, troubleshooting and servicing heat pumps. (Prereq: HVAC1000 and HVAC1040) **(BP/EP) 1 cr**

HVAC1150 HYDRONIC HEAT SYSTEMS
This course is designed to teach the student the safety concerns and operation of hydronic heating systems. The student will learn troubleshooting and repair of hydronic heating systems. (Prereq: HVAC1000) **(BP/EP) 1 cr**

HVAC1155 RADIANT HEAT SYSTEMS
This course will expose the student to in-floor/ceiling radiant heat concepts that include sizing, application, and servicing. (Prereq: None) **(BP) 1 cr**

HVAC1160 AIR QUALITY SYSTEMS
This course will introduce the student to the skills necessary to service air filtration systems, heat recovery ventilators and humidifiers. (Prereq: None) **(BP/EP) 1 cr**

HVAC1180 MN SPECIAL BOILERS LICENSE
This course covers the information needed to take the Minnesota State Special Boilers License Examination. State of Minnesota Boiler Inspectors will administer the Special Exam on the last day of the course. Note: The Minnesota Department of Labor and Industry has implemented a new 15-day pre-application requirement on all exams. Please contact the HVAC Instructor at least 21 days in advance of the course start date for fee and pre-application requirements if you wish to take the Special Boilers Licensing Exam on the last day of the course. (Prereq: None) **(BP/EP) 1 cr**

HVAC2001 PACKAGED HEATING AND COOLING EQUIPMENT
In this course students will learn heating and cooling principles relating to commercial machines. Students will learn about and work on rooftop machines, computer room units and make up air systems. (Prereq: None) **(EP) 4 cr**

HVAC2010 HEAT PUMP SYSTEMS
In this course the student will learn the installation, operation and service techniques needed to understand heat pumps. The auxiliary equipment relating to water source heat pumps will also be covered. (Prereq: None) **(EP) 2 cr**

HVAC2020 PNEUMATIC CONTROLS
In this course students will be introduced to pneumatic controls. Content will contain the various pneumatic controllers, sensors and related devices. Theory of operation will also be covered. (Prereq: None) **(EP) 2 cr**

HVAC2030 COMMERCIAL ICE MAKING MACHINES
Students in this course will learn about the machines that make ice for commercial applications. Cube and flake processes will be covered. This course involves advanced electrical and refrigerant troubleshooting procedures. (Prereq: None) **(EP) 3 cr**

HVAC2041 GAS/REFRIGERATION (MECHANICAL) CODE
This lecture course is designed to assist the student in becoming familiar with the Uniform Mechanical Code. Students will use the Uniform Mechanical Code book and the Minnesota Amendments in this course. (Prereq: None) **(EP) 1 cr**

HVAC2050 ELECTRICAL FOR COMMERCIAL HVAC & R EQUIPMENT
This course introduces the concepts and principles of three phase power and line voltage control and the controllers. Motor wiring techniques are also included in this primarily lecture course. (Prereq: None) **(EP) 2 cr**

HVAC2060 COMPUTER ROOM AIR CONDITIONING
This course entails heat/cool machines for computer room comfort control. This course will teach the student installation, start up and servicing of computer room heat/cool machines. (Prereq: Residential Heating/Air Conditioning/Refrigeration program or equivalent industry experience on residential equipment) **(EP) 1 cr**

HVAC2100 WATER CHILLER MACHINES
This lecture course introduces theory and operation of the equipment required to heat and cool water for the environment conditioning of commercial buildings. Repair and operation of pumps, valves and chillers will be explained. (Prereq: None) **(EP) 3 cr**

HVAC2111 LOW PRESSURE STEAM AND WATER BOILERS
This lecture course is designed to provide the student with the knowledge to take and pass the Minnesota Boilers Low Pressure Licensing exams. Students will learn safe and efficient operation of boilers. (Prereq: None) **(EP) 2 cr**

HVAC2120 REFRIGERATED COOLERS AND CASES
In this course students will learn about and work on walk-in coolers and meat and dairy cases. Electrical and refrigeration troubleshooting will be stressed. Students will also work with a variety of refrigerants. (Prereq: None) **(EP) 3 cr**

HVAC2130 SUPERMARKET REFRIGERATION
In this course students will have the opportunity to learn multiple compressor and multiple cooling/freezing case operation. Complex refrigeration controls as well as electrical and refrigeration defrost circuits will be the focus of this course. (Prereq: None) **(EP) 3 cr**

HVAC2140 ABSORPTION CHILLERS
This course covers fundamentals of absorption refrigeration machines. The student will learn the theory and operation of absorption machines. (Prereq: None) **(EP) 1 cr**

HVAC2150 ENERGY MANAGEMENT
This course introduces the student to installation and use of the Direct Digital Control Energy Management System. The course will involve computer usage and interfacing with H.V.A.C. equipment. V.A.V. air systems will also be taught. (Prereq: None) **(EP) 2 cr**

HVAC2160 REFRIGERATION SERVICE I
This lab course is designed for students enrolled in Commercial Refrigeration. Students will repair malfunctioning equipment as in a service situation. (Prereq: None) **(EP) 1 cr**

Course Descriptions

HVAC2165 HEAT RECOVERY VENTILATORS
This course will offer a detailed analysis of HRV's and the MN Energy Code certification through HRAI as a HRV Installer is available. (Prereq: None) **(BP/EP) 1 cr**

IBEM1000 WELDING MAINTENANCE
Introduction to SMAW and GMAW welding processes and plasma, oxy-acetylene, sawing, and abrasive cutting processes. Covers identification and weldability of metals, safety and basic tool practices. Students will learn to layout, fit and weld sheet, plate, round and square shapes of steel, stainless steel and aluminum. (Prereq: None) **(BP) 3 cr**

IBEM1010 CARPENTRY MAINTENANCE
This course introduces students to the basic principles and techniques of maintenance carpentry. Students will have the opportunity to read and interpret blueprints, identify code requirements, operate basic power tools, install/repair doors, casing, cabinetry and drywall. (Prereq: None) **(BP) 3 cr**

IBEM1020 HVAC MAINTENANCE
This course will expose students to refrigeration theory, system components and cooling cycles of residential and light commercial air conditioning systems. Basic troubleshooting of the cooling cycle will also be covered. (Prereq: None) **(BP) 3 cr**

IBEM1030 TUBE AND PIPE REPAIR
This course will introduce students to the basic techniques involved in tube and pipe repair. Students will also learn related industrial safety practices. (Prereq: None) **(BP) 2 cr**

IBEM1040 RIGGING PROCEDURES AND FORKLIFT OPERATIONS
This course is designed to introduce students to the safety, equipment and operations used in rigging procedures. Students will also learn safe forklift operation procedures. (Prereq: None) **(BP) 1 cr**

LANG2100 BEGINNING SPANISH
This course has been developed for students with very minimal previous experience with languages. The student will study and practice basic writing, reading, pronunciation and listening skills. Special emphasis will be placed upon cultural aspects and basic communication at the worksite.
(Prereq: None) **(BP/EP) 4 cr**

LNDC1110 INTRODUCTION TO LANDSCAPE/HORTICULTURE
This course is designed to introduce the student to the many and varied areas of the landscape industry, the employment opportunities and educational requirements. This course will help students understand the landscape industry and formulate career education goals. (Prereq: None) **(BP) 1 cr**

LNDC1120 LANDSCAPE PLANTS - TREES
This course is designed to give the student a comprehensive understanding of shade, ornamental and native deciduous trees and coniferous evergreen trees. Emphasis will be given to identifying characteristics, nomenclature and their use in the landscape. (Prereq: None) **(BP) 4 cr**

LNDC1130 ARBORICULTURE I
This course is designed to give the student a fundamental knowledge of the care of woody plants in the landscape. Cultural practices and pruning techniques for trees and shrubs will be covered. (Prereq: None) **(BP) 2 cr**

LNDC1140 NURSERY PROPAGATION AND PRODUCTION
This course is designed to give the student a fundamental understanding of the production process and cultural practices for growing landscape plants from the green house to the nursery plot. (Prereq: None) **(BP) 2 cr**

LNDC1151 INSECTS AND DISEASES OF LANDSCAPE PLANTS
This course is designed to give the student a fundamental understanding of insects and diseases that normally confront practitioners in the industry. (Prereq: None) **(BP) 3 cr**

LNDC1160 GREENHOUSE OPERATION AND MANAGEMENT
This course is designed to give the student a practical understanding of green house structures, how greenhouse environments are controlled and the application of specialized green house equipment. (Prereq: None) **(BP) 2 cr**

LNDC1166 GREENHOUSE CROPS - FALL
This course is designed to give the student an understanding of commercial greenhouse crop production. Emphasis will be on chrysanthemums, poinsettias and potted plants.
(Prereq: LNDC1160) **(BP) 3 cr**

LNDC1176 GREENHOUSE CROPS - WINTER
This course is designed to give the student an understanding of the production and culture of winter floriculture crops. Special emphasis will be given to Easter lilies. (Prereq: LNDC1160) **(BP) 3 cr**

LNDC1190 LANDSCAPE PLANTS - SHRUBS
This course is designed to give the student a comprehensive understanding of deciduous and evergreen shrubs. Emphasis will be given to identifying characteristics, nomenclature and uses in the landscape. (Prereq: None) **(BP) 4 cr**

LNDC1201 HERBACEOUS PLANTS I
This course is designed to give the student a fundamental understanding and a working knowledge of herbaceous plants and how to grow and maintain them in the landscape. Included in the plant study are annuals, perennials and ground covers.
(Prereq: None) **(BP) 3 cr**

LNDC1210 HERBACEOUS PLANTS II
Herbaceous Plants II is an in-depth study of the more unusual, exotic and designer perennials available in the upper Midwest. Culture, characteristics, design uses and identification will be emphasized. (Prereq: LNDC1201) **(BP) 2 cr**

LNDC1220 INTEGRATED PEST MANAGEMENT
This course is a study of the insect and disease problems that affect green house crops, nursery crops and plants in the landscape. Management of environments, cultural practices and use of chemicals will be covered. This is a preparatory study for taking the state pesticide applicators license test.
(Prereq: None) **(BP) 2 cr**

LNDC1231 NURSERY OPERATIONS
This course explores the many aspects of how a production nursery operates including growing, cultural practices, harvesting, and shipping and how this fits into the landscape horticulture industry. Field labs will allow the student opportunities to implement lecture information. (Prereq: None) **(BP) 2 cr**

LNDC1235 LANDSCAPE OPERATIONS
This course will explore the process of how greenscape and hardscape ideas become completed field projects. Sources of materials, handling, installation procedures, project coordination and problem solving will be covered. Labs will be an important part of students gaining field experience. (Prereq: None) **(BP) 2 cr**

LNDC1241 PLANT BIOLOGY
This course is designed as an overview of the taxonomic and structural characteristics of higher plants. An understanding of plant anatomy and how plants function and grow will be covered. (Prereq: None) **(BP) 3 cr**

LNDC1250 BEDDING PLANT PRODUCTION
This course is designed to introduce the student to growing techniques for herbaceous plant crops. A large percentage of the plants grown are bedding plants. Cultural schedules are developed to finish the crop at a potentially profitable time. Marketing techniques are also included. (Prereq: None) **(BP) 3 cr**

LNDC1271 SOIL SCIENCE
This course will help the student recognize the various types of soils and how plants respond to various soils and soil fertility. (Prereq: None) **(BP) 3 cr**

LNDC2100 LANDSCAPE SUPERVISION
This course is designed to give qualified students an opportunity to develop and demonstrate their ability to organize a landscape construction project. Students will develop their technical skills as well as their interpersonal skills in dealing with personnel in getting the project completed. (Prereq: None) **(BP) 1 cr**

LNDC2110 INTRODUCTION TO LANDSCAPE CONSTRUCTION
This course is designed to give the student a basic understanding of essential skills necessary in the landscape construction industry. Included are blue print reading, landscape surveying, grading and drainage and basic carpentry. (Prereq: None) **(BP) 2 cr**

LNDC2120 LANDSCAPE CONSTRUCTION I
This course is designed to prepare the student for professional competency in the area of landscape construction. Emphasis will be given to plan reading, plan take offs and extensive field lab projects. The focus of this course will be on retaining walls and surfacing materials such as pavers, stone work and concrete. (Prereq: LNDC2110) **(BP) 4 cr**

LNDC2130 LANDSCAPE CONSTRUCTION II
This course is designed to prepare the student for professional competency in the area of landscape construction. Emphasis will be given to plan reading, plan take offs and extensive field lab projects. The focus of this course will be on deck and fence construction. (Prereq: LNDC2110) **(BP) 4 cr**

LNDC2150 ADVANCED ARBORICULTURE
This course is a continuation of Arboriculture I with emphasis on tree care. The focus of this study will be on specialized cultural practices to include fertilization, soil management, trimming and pruning. There will be extensive field lab time devoted to rope and saddle work and climbing techniques. (Prereq: LNDC1130) **(BP) 2 cr**

LNDC2160 LANDSCAPE DESIGN I
This course is designed to give the student a fundamental knowledge of landscape design principles and an opportunity to develop skills in designing and drafting landscape plans. (Prereq: LNDC1120 and LNDC1190) **(BP) 4 cr**

LNDC2170 LANDSCAPE DESIGN II
This course is a continuation of Landscape Design I. Advanced design concepts, problem solving and detail drawing will be covered. Students will take projects through the complete design process from site analysis to concept and working drawings. (Prereq: LNDC1180 and LNDC2160) **(BP) 4 cr**

LNDC2180 DESIGN FLOWER BEDS
This course is designed to provide the design student or the student with a special interest in the expanding field of garden design, an opportunity to develop design skills and to expand their knowledge of herbaceous plants. (Prereq: LNDC1201) **(BP) 2 cr**

LNDC2190 ADVANCE DESIGN/SALES
This course is a continuation of Landscape Design II. Emphasis will be given to presentation techniques, advanced graphics and landscape design communication including the combined use of CADD software and digital cameras for visual presentation. (Prereq: LNDC2170) **(BP) 2 cr**

LNDC2210 INTERIOR FOLIAGE PLANTS
This course is designed as a plant study in interior landscape/foliage plants. An overview of the interior landscape contracting industry and interior landscape design will be included. (Prereq: None) **(BP) 2 cr**

LNDC2220 TURF GRASS CULTURE AND MAINTENANCE
This course is designed to give the student a comprehensive knowledge of the many kinds of turf grasses used in the upper Midwest for residential, commercial and athletic areas. Emphasis will also be given to their cultural requirements and specialized turf maintenance equipment. (Prereq: None) **(BP) 3 cr**

LNDC2230 TURF PEST MANAGEMENT
This course is designed to give the student a fundamental knowledge of turf pests to include insects, diseases and weeds and the cultural practices and chemicals used for their control. (Prereq: None) **(BP) 2 cr**

LNDC2240 LANDSCAPE EQUIPMENT OPERATION
This course is a hands on equipment operation course. Students will have the opportunity to operate a variety of landscape equipment including skid loaders, tractors, compactors, trucks, tree spades and specialized turf equipment. (Prereq: None) **(BP) 4 cr**

LNDC2250 LANDSCAPE MANAGEMENT
Landscape Management is a second year course designed for students that anticipate owning their own landscape related business or who wish to progress into management levels of a landscape business. The course will focus on understanding how businesses in this industry operate, how they are regulated, how they are managed, what the future trends are and how to write a business plan. (Prereq: 2nd year student) **(BP) 2 cr**

LNDC2260 PROFESSIONAL GARDENING
This course is designed to prepare the student to professionally manage the maintenance of small gardens. Students will learn landscape gardening on a twelve month basis to include site preparation, fertilizing, soil analysis and amendment, plant selection, pest management, pruning, tools, weed identification and field propagation. In addition, students will explore business techniques, bidding and the relationship of design styles to maintenance requirements. Field laboratory activities will give the students opportunities to apply classroom information. (Prereq: None) **(BP) 2 cr**

LNDC2271 LANDCADD DESIGN I
This course is designed to introduce the student to the application of the computer in landscape drafting and plan development. LandCADD and Site Designer software are used. Students will implement the computer to create designs and produce/print completed drawings. (Prereq: CPLT1000) **(BP) 3 cr**

LNDC2280 LANDCADD DESIGN II
This course is a continuation of LandCADD I. The students will prepare complete landscape plans and working drawings. Students will learn how to produce material lists, quantity takeoffs and estimates using the computer as well as how to customize the graphics and the application of digital photographs for visual presentations. (Prereq: LNDC2271) **(BP) 3 cr**

LNDC2330 LANDSCAPE CONSTRUCTION INTERNSHIP CERTIFICATE
This is a cooperative training program between Hennepin Technical College and a landscape occupation facility which allows the student to apply competencies learned in the program to an employment-like work experience (Prereq: None) **(BP) 4 cr**

LNDC2335 LANDSCAPE CONSTRUCTION INTERNSHIP
This is a cooperative training program between Hennepin Technical College and a landscape occupation facility which allows the student to apply competencies learned in the program to an employment-like work experience. (Prereq: None) **(BP) 1-4 cr**

LNDC2340 ARBORICULTURE INTERNSHIP CERTIFICATE
This is a cooperative training program between Hennepin Technical College and a landscape occupation facility which allows the student to apply competencies learned in the program to an employment-like work experience. (Prereq: None) **(BP) 4 cr**

LNDC2345 ARBORICULTURE INTERNSHIP
This is a cooperative training program between Hennepin Technical College and a landscape occupation facility which allows the student to apply competencies learned in the program to an employment-like work experience. (Prereq: None) **(BP) 1-4 cr**

LNDC2350 GROUNDS MAINTENANCE INTERNSHIP
This is a cooperative training program between Hennepin Technical College and a grounds maintenance occupation facility which allows the student to apply competencies learned in the program to an employment/work experience. (Prereq: Completion of courses for a certificate or instructor approval) **(BP) 1-4 cr**

LNDC2360 HORTICULTURE INTERNSHIP
This is a cooperative training program between Hennepin Technical College and a landscape occupation facility which allows the student to apply competencies learned in the program to an employment-like work experience. (Prereq: None) **(BP) 1-4 cr**

MACH1056 BLUEPRINT READING I
This course is designed for people who are currently working on, or training to be employed in technical positions that require the use of engineering drawings. Dimensions and notes, multi-view drawings, tolerancing and shop sketching will be given consideration. This course will focus on the latest drafting conventions including ANSI standards. Students will use textbooks and handouts that guide them through how blueprints are developed and how to interpret them. (Prereq: None) **(BP/EP) 3 cr**

MACH1100 INTRODUCTION TO MACHINING TECHNOLOGY
This course will give the student an overview of machining technology as it is used in the manufacturing industry today. The course also covers shop safety, use of hand tools, use of precision measuring tools and the operation of the pedestal grinder. (Prereq: None) **(BP) 3 cr**

MACH1105 DRILLING AND SAWING PROCESSES
This course will introduce the student to the horizontal cutoff saw, the vertical bandsaw and operation of the drill press. Hands on use of these machine tools will be emphasized. (Prereq: MACH1100) **(BP) 2 cr**

MACH1110 TURNING TECHNOLOGY I
This course is designed to introduce the student to the function and application of the engine lathe. Basic turning operations will be covered. In addition, consideration will be given to threading with taps and dies, boring and grooving operations. (Prereq: MACH1105) **(BP) 3 cr**

MACH1120 TURNING TECHNOLOGY II
This course is a continuation of Turning Technology I covering the following lathe operations: single-point thread cutting, knurling, form tools and cutting tapers. Special emphasis will be placed on turning with carbide insert tooling. (Prereq: MACH1110) **(BP) 3 cr**

MACH1125 MILLING TECHNOLOGY I
This course will introduce the student to the operation of the vertical milling machine. Emphasis will be placed on machine setup and machining parts square and parallel. Drilling, reaming, tapping, boring and angle milling will also be covered. (Prereq: MACH1105) **(BP) 3 cr**

MACH1130 MILLING TECHNOLOGY II
This course is a continuation of Milling Technology I and will cover the following vertical milling operations: pocket milling, form cutters, milling keyways, using a dividing head and rotary table. (Prereq: MACH1125) **(BP) 3 cr**

MACH1135 PRECISION GRINDING
This course is designed to introduce the student to the surface grinder. Grinding flat surfaces, angles and form grinding will be covered. (Prereq: MACH1130) **(BP) 2 cr**

MACH1140 INTRODUCTION TO CNC
This course will introduce the students to the fundamentals of computer numerical control (CNC) milling and turning. Basic CNC operation and conversational programming will be covered. (Prereq: MACH1120 and MACH1130) **(BP) 3 cr**

MACH1145 MACHINISTS REFERENCE MATERIALS
This course will introduce the student to the use of reference books used by individuals in the machining industry. The use of Machinery's Handbook and The Machinists Practical Guide will be covered. (Prereq: None) **(BP) 1 cr**

MACH1205 MACHINE TOOL TECHNOLOGY
This course is designed for students who are working or majoring in engineering or mechanical fields. These fields include areas such as: Automated Machinery Systems: Packaging, Engineering CAD, Fluid Power, Machine Tool, Manufacturing Engineering and Plastics. The theory and application of machine tools to these fields will be emphasized. The concepts of CNC, Tool and Die, and Moldmaking will also be explored. (Prereq: None) **(BP/EP) 3 cr**

MACH2400 CNC SETUP AND OPERATION
This course will expose students to CNC machines. The student will be introduced to safety procedures, set up, and operation of various types of CNC machines. (Prereq: CNC Operators Certificate or equivalent industry experience) **(BP) 3 cr**

MACH2406 CNC PROGRAMMING
This course will introduce the student to computer numerical control machine tools. CNC programming, set up, and operation will be studied. Milling and turning programs will be developed and examined. (Prereq: None) **(BP) 3 cr**

MACH2410 CAD/CAM
This course will introduce the student to computer-assisted design and computer-assisted machining. Machining processes and post-processor selection will also be covered. Students will use the latest version of Surfcam software to develop 2D milling and turning CAD/CAM programs. 3D concepts will also be covered. (Prereq: METS1000 or basic computer skills) **(BP) 3 cr**

MACH2415 CNC MILLING
This course is designed to introduce the student to the fundamentals of computer numerical control milling. Programming, tooling requirements, machine setup, and machine operation will be emphasized. (Prereq: MACH2400 and MACH2406) **(BP) 3 cr**

MACH2420 BLUEPRINT READING II FOR MACHINISTS
This course is a continuation of Blueprint Reading I. Enhancing machinists and inspectors blueprint reading skills will be emphasized. An introduction to Geometric Dimensioning and Tolerancing will be covered along with other advanced blueprint reading skills. (Prereq: MACH1056) **(BP) 2 cr**

MACH2425 GEOMETRY/TRIGONOMETRY FOR MACHINISTS
This course covers the practical application of the basic principles of plane geometry and right angle trigonometry to solve machine shop related problems. Included will be right triangle functions and solutions along with the law of sines and the law of cosines. (Prereq: MATH1010) **(BP) 2 cr**

MACH2430 CNC MACHINING CENTERS
This course will allow the student to increase their skills in CNC milling applications. CNC machining centers will be explored. Programming, tooling requirements, machine setup, and machine operation of CNC machining centers will be emphasized. (Prereq: MACH2415 or equivalent industry experience) **(BP) 3 cr**

MACH2435 CNC TURNING CENTERS
This course is designed to introduce the student to CNC turning centers. Programming, tooling, set up and operation of CNC turning centers will be emphasized. (Prereq: MACH2400 or equivalent industry experience) **(BP) 3 cr**

Course Descriptions

MACH2440 QUALITY ASSURANCE
This course will expose the student to quality control concepts utilizing common manufacturing inspection methods. Inspection tools examined will include the CMM machine, digital height stand, optical comparator, profilometer, etc. SPC and ISO 9000 series will also be discussed. Students will perform inspections of mechanical parts and create inspection forms and charts. (Prereq: None) **(BP) 2 cr**

MACH2445 HEAT TREATING AND METALLURGY
This course will introduce the student to the identification and characteristics of the common metals used in the machining industry. Emphasis will be placed on the composition of steel and the effects of its alloys. Heat treating and hardness testing of steel will also be examined. (Prereq: None) **(BP) 2 cr**

MACH2450 FUNDAMENTALS OF EDM
This course is designed to introduce the student to the fundamentals of electrical discharge technology. The processes covered will include the programming, tooling, set up and operation of traveling wire and sinker EDM machines. (Prereq: CNC Operators Certificate or equivalent industry experience) **(BP) 2 cr**

MACH2455 DIE/MOLD DESIGN
This course will introduce students to the concepts of Tool & Die and Moldmaking. Projects include designing a basic die and mold. (Prereq: CNC Operators Certificate or equivalent industry experience) **(BP) 3 cr**

MACH2460 DIE CONSTRUCTION
This course applies the principle skills learned from Die/Mold Design to the construction of basic die components. (Prereq: MACH2455) **(BP) 3 cr**

MACH2465 MOLD CONSTRUCTION
This course applies the principle skills learned in Die/Mold Design to the construction of basic mold components. (Prereq: MACH2455) **(BP) 3 cr**

MACH2470 ADVANCED CNC TURNING CENTERS
This course is designed to allow the student to increase his/her skill level in CNC Turning Centers. Skills learned in CNC Turning Centers will be applied to programming and machining selected turned parts. (Prereq: MACH2435) **(BP) 3 cr**

MACH2475 GIBBS CAD/CAM MILLING
This course will introduce the student to computer-assisted design and computer-assisted machining. Students will use the latest version of GibbsCAM software to simulate CNC milling and generate CNC code. Part design, machining processes, and post-processor selection will be covered. (Prereq: METS1000 or basic computer skills) **(BP) 3 cr**

MACH2500 INTRODUCTION TO SWISS-STYLE MACHINING
This course will expose students to the basics of CNC Swiss Style Lathes. The student will be introduced to safety procedures and the nomenclature of CNC Swiss Style lathes. Basic CNC turning, milling, and drilling procedures will be reviewed. Comparisons of CNC turning as opposed to CNC Swiss-Style training will be examined. Basic concepts of the set up and operation of CNC Swiss-Style Lathes will be explored and common G&M codes will be identified. Small part inspection techniques will also be covered. (Prereq: Graduation from or concurrent enrollment in a 2 year Machine Tool Technology Program or a minimum of 2 years of related work experience) **(BP) 3 cr**

MACH2505 CNC SWISS-STYLE LATHE SETUP AND OPERATION
This course will further expose students to the setup of CNC Swiss Style Lathes, tooling, and the bar feeder. The student will set up and operate CNC Swiss-Style Lathes. Parts will be machined from selected programs. (Prereq: MACH2500 plus graduation from or concurrent enrollment in a 2 year Machine Tool Technology Program or a minimum of 2 years of related work experience) **(BP) 3 cr**

MACH2510 CNC SWISS-STYLE LATHE PROGRAMMING
This course will require students to write and produce programs for CNC Swiss Style Lathes. The student will then machine parts on the CNC Swiss-Style Lathes from these programs. Set up and cycle reduction time will also be covered. (Prereq: MACH2505 plus graduation from or concurrent enrollment in a 2 year Machine Tool Technology Program or a minimum of 2 years of related work experience) **(BP) 3 cr**

MADV1010 BASIC DRAWING
This course introduces the concepts of basic drawing, one and two point perspective, basic line illustration, freehand drawing, basic form and shading techniques as it applies to sound, design and professional drawing. (Prereq: None) **(BP) 3 cr**

MADV2000 PRINT MEDIA ADVERTISING
This advanced course introduces the concepts of creative advertising as applied to the newspaper and magazine industry. Student will focus on the skills necessary to design, layout and produce an advertising campaign. Students will produce computer comprehensives ready for portfolio and client presentation. (Prereq: MGDP1225, MGDP1230, MGDP1235, MGDP1240 and MGDP2010 or instructor approval) **(BP) 3 cr**

MADV2020 COLLATERAL ADVERTISING
This advanced course introduces a creative approach to principles, and design of booklets, brochures, catalogs and other specialized forms of printed advertising materials. Students will produce computer comprehensives ready for portfolio and client presentation. (Prereq: MGDP1225, MGDP1230, MGDP1235, MGDP1240 and MGDP2010 or instructor approval) **(BP) 3 cr**

MADV2030 PACKAGING AND DISPLAY ADVERTISING
This advanced course introduces a creative approach to principles, and design of packaging, graphics displays and outdoor advertising. Students will produce computer comprehensives ready for portfolio and client presentation. (Prereq: MGDP1225, MGDP1230, MGDP1235, MGDP1240 and MGDP2010 or instructor approval) **(BP) 3 cr**

MATH0900 FUNDAMENTALS OF MATHEMATICS
This course applies basic arithmetic skills of whole numbers, fractions, decimals, ratio and proportion and percents, with applied problems. (Prereq: None) **(BP/EP) 2 cr**

MATH1000 PREALGEBRA
This course includes practical applications of the basic mathematical operations including: fractions, decimals, percents, ratio, proportion, measurement, perimeter, area, volume, descriptive statistics and introductory algebra. (Prereq: Qualifying score on CPT math assessment test OR Grade of "C" or better in MATH0900) **(BP/EP) 2 cr**

MATH1005 BUSINESS MATHEMATICS
This course includes practical applications of mathematical operations including: problem solving with ratio, proportion and percent; banking, basic equation solving, purchasing, pricing, payroll, simple and compound interest, taxes, investments and descriptive statistics. (Prereq: Qualifying score on CPT math assessment test OR MATH0900) **(BP/EP) 2 cr**

MATH1010 BEGINNING ALGEBRA
This course includes practical applications of basic algebra from signed numbers through solving and graphing equations plus solving systems of equations and formulas with applied problems. (Prereq: Qualifying score on CPT math assessment test OR Grade of "C" or better in either MATH1000 or MATH1005) **(BP/EP) 2 cr**

MATH1020 GEOMETRY AND TRIGONOMETRY
This course includes practical applications of basic definitions and properties of plane geometry, trigonometric functions, the law of sines, the law of cosines and vectors. (Prereq: MATH1010 or equivalent) **(BP/EP) 2 cr**

MATH1031 INTERMEDIATE ALGEBRA
This course includes practical applications of advanced algebra topics: polynomials and factoring, quadratic equations, exponents and radicals, radicals equations and formulas, plus common and natural logarithms. (Prereq: Qualifying score on CPT math assessment test OR Grade of "C" or better in MATH1010) **(BP/EP) 3 cr**

MATH2100 CONCEPTS IN MATHEMATICS
This course uses the skills necessary to apply the mathematical tools of algebra, geometry, trigonometry, probability and statistics to solve problems and defend solutions and decisions. (Prereq: Qualifying score on CPT math assessment test OR MATH1031) **(BP/EP) 3 cr**

MATH2200 COLLEGE ALGEBRA
Topics covered in this course include: concepts of algebra-real numbers, exponents, polynomials, and rational expressions; equations and inequalities; functions and graphs; polynomial and rational functions; exponential and logarithmic functions; conic sections; systems of equations and inequalities; sequences and probability. (Prereq: Qualifying score on CPT math assessment test OR MATH1031) **(BP/EP) 4 cr**

METS1000 COMPUTERS IN MANUFACTURING
This course is for those currently working or studying to work in manufacturing areas that need to learn basic computer skills that relate to work in the manufacturing environment. Topics covered include basic Windows 2000, Internet, e-mail, word-processing, spreadsheets, and CAD. (Prereq: None) **(BP/EP) 3 cr**

METS1020 INDUSTRIAL MANUFACTURING PROCESSES
This course is designed to introduce the student to manufacturing methods commonly used to produce industrial parts. The information in this course is useful to students in most technical occupations. Study includes selecting a process that will produce parts with optimum physical properties at the lowest cost. (Prereq: None) **(BP/EP) 3 cr**

METS1030 QUALITY ASSURANCE/STATISTICAL PROCESS CONTROL
This course will expose the student to quality control concepts utilizing common manufacturing inspection methods. Inspection tools will include CMM machines, the digital height stand, profilometer and toolmaker's microscope. This course includes elementary statistics and theory of Statistical Process Control (SPC). Measuring and plotting process variation, developing and using control charts, process monitoring and problem solving will be emphasized. (Prereq: None) **(BP/EP) 3 cr**

METS1040 INTRODUCTION TO COMPETITIVE ROBOTS

This introductory course will offer students hands-on experiences in planning and building smaller competitive robots. Students that enroll will explore the design, the engineering, and the construction associated with the robots. Students will also be exposed to the variety of manufacturing programs offered at Hennepin Technical College. (Prereq: None) **(EP) 2 cr**

METS1045 BUILDING/PROGRAMMING AN AUTONOMOUS ROBOT

In this course students will build and program a small robot based on the Bugbrain/Cricket models. During the construction of the robot, students will be exposed to electronic components, printed circuit boards as well as the BasicX microprocessor and its programming language. Students will develop a basic understanding of these electronic components plus develop assembly/soldering techniques. The students will take home their projects and the programming language after the course is finished to continue exploring and expanding the robots for themselves. (Prereq: None) **(EP) 2 cr**

METS1500 FUNDAMENTALS OF QUALITY CONCEPTS AND SYSTEMS

This course will encompass review and discussion of fundamental quality concepts and various quality systems. Fundamental concepts of quality will be covered including: variation, charting and diagrams, problem solving and process improvement, team guidelines, metrics, control charts and process capability, project tools, as well as others. There will also be discussion on the roles of quality and associated tools within the business environment.

Types of quality systems covered will include: ISO 9001, Malcom Baldrige National Quality Award, some state quality awards, as well as others. There will also be discussion on quality system planning, implementation and integration with other quality and business systems. (Prereq: None) **(EP) 3 cr**

METS1510 LEAN PROJECT MANAGEMENT: PROJECT DEVELOPMENT AND IMPLEMENTATION

This course encompasses review and discussion of the major components and process of developing a project plan for implementing Lean in an organization. Success of any program is highly dependent on the project planning that occurs before the program commences as well as its ongoing management as it progresses. Partial listing of concepts covered include: Management buy-in and support, resource determination and budgeting. (Prereq: None) **(EP) 3 cr**

METS1515 LEAN BEYOND THE PRODUCTION FLOOR

This course encompasses review and discussion of the major Lean principles and practices and their application in areas other than the manufacturing. This class provides a more detailed review of the major lean tools and their use and application in non-production areas.

Partial listing of Lean tools covered include: Visual Management, 5S, Problem Solving, Mistake Proofing, Kaizen, Value Stream Mapping, as well as others. There will also be discussion on the high level (overarching) principles and philosophies of Lean Manufacturing and Lean Enterprise.

This course utilizes a Lean Simulation tool to enhance the learning experience by demonstrating the actual use of Lean principles and tools in a simulated manufacturing environment. The simulation tool compares and contrasts traditional processes with Lean to show subsequent results improvement. There will also be discussion on Lean program planning and implementation as ti relates to non-manufacturing areas of the organization. (Prereq: METS1505) **(EP) 3 cr**

METS1520 ADVANCED TOOLS IN LEAN IMPLEMENTATION

This course encompasses review and discussion of the major principles and practices of Lean. This class provides a more detailed review and discussion of the major lean tools, including their use and application. There will also be discussion on the high level (overarching) principles and philosophies of Lean Manufacturing and Lean Enterprise. This class compliments and expands upon the basic concepts presented in Principles and Practices of Lean Manufacturing: Lean Tools and Techniques.

This course utilizes a Lean Simulation tool to enhance the learning experience by demonstrating the actual use of Lean principles and tools in a simulated operations environment. The simulation tool compares and contrasts traditional processes with Lean to show subsequent results improvement. (Prereq: METS1505) **(EP) 3 cr**

METS1525 QUALITY SYSTEM/LEAN PROGRAM DEVELOPMENT

This course encompasses review and discussion of the components of a Quality System or Lean program components and implementation steps, resources, timelines, etc. The focus will be on the development of an actual Quality System or Lean program implementation plan. This class is an independent workshop with the participants working individually or in small groups to create and document a plan for actual implementation of a Lean or Quality System. (Prereq: METS1505 and METS1510) **(EP) 3 cr**

METS2000 ENGINEERING DESIGN PRINCIPLES

This course covers the nature of design, rotary and linear motion components such as: levers, linkages, winches, chain, belt and sprocket drives, gear boxes and electric motors. Hydraulic and pneumatic actuators and limited rotation devices will be discussed. Various applications will be discussed and evaluated during the course. The student will get experience selecting mechanical drive components, bearings, and fasteners from various vendor catalogs. Students will work in teams to develop an assigned project. Individuals involved in plant engineering and maintenance, machine design, and manufacturing should consider this course. (Prereq: MATH1000 to be taken concurrently) **(BP/EP) 3 cr**

METS2100 STATICS AND STRENGTH OF MATERIALS
This course will introduce the student to the understanding and applications of applied physics. Items covered will include the use of calculators to solve algebra and trigonometry functions, vectoring equilibrium's, stress, strain, deformations, moments of inertia and section modules, belt friction, thermal expansion, welded and bolted connections. (Prereq: MATH1020 or MATH2100 or MATH2200) **(BP/EP) 3 cr**

METS2800 MANUFACTURING ENGINEERING TECHNOLOGY INTERNSHIP
The course provides students with an internship experience in one of the following specializations: Electronics, Fluid Power, Machining, Mechanical Design or Plastics. Students are evaluated by predetermined curriculum objectives agreed upon by the employer, instructor and student. The student is expected to interview for and acquire an internship site. (Prereq: Instructor approval) **(BP) 1-16 cr**

MGDP1205 FUNDAMENTALS OF GRAPHIC DESIGN
Graphic Design by definition is the applied art of designing any information, thought, idea or message for print or digital media. This course is designed to give the student the skills necessary to realize and value the graphic design environment. Course content includes historical overview, technological advances, common applications, basic design principles, layout and advertising concepts, typographical creativity, common tools and measuring systems. Whether the design is for print, web, or the multimedia, the student will explore the various design concepts that allow a thought, idea or message to be effectively communicated. Hands-on projects, demonstrations, experimentation, and case studies will be used in a positive industry driven learning environment. (Prereq: None) **(BP/EP) 3 cr**

MGDP1220 CONCEPTS IN CREATIVITY
Having employees that can think creatively is one of the major challenges facing business and industry. This course will enable the student develop their own creative learning skills. They will be faced with a series of problems and through research and creative exercises come up with their own solutions. (Prereq: None) **(BP/EP) 3 cr**

MGDP1225 QUARKXPRESS I
This is an introductory course in QuarkXPress. The student will become familiar with this industry standard page layout program by learning how to use the tools, palettes, page setup, preferences, editing techniques, paragraph formatting, image importing, understanding and applying color, libraries and the bezier tool. The student will be required to create various projects that solidify software features, apply page design skills, and maximize typographical knowledge. (Prereq: MGDP1205 or concurrent) **(BP/EP) 3 cr**

MGDP1226 QUARKXPRESS I (WINDOWS)
This is an introductory course in QuarkXPress. The student will become familiar with this industry standard page layout program by learning how to use the tools, palettes, page setup, preferences, editing techniques, paragraph formatting, image importing, understanding and applying color, libraries and the bezier tool. The student will be required to create various projects that solidify software features, apply page design skills, and maximize typographical knowledge. (Prereq: MGDP1205 or concurrent) **(EP) 3 cr**

MGDP1230 PHOTOSHOP
This course is designed to give the student basic knowledge and understanding of Adobe Photoshop. The student will be introduced to the operation of tools used in Photoshop. Also included in this course will be an introduction to the use of layers (element layers, layer masks, grouping layers, blending layers and using underlying layers), channels (color and alpha), selections (making, saving and loading), masks (quick masks, saving and editing), color modes, tonal correction (levels and curves), resolution control, file formats, drop shadows, text effects, filters, preparing files for web publication and memory management. (Prereq: MGDP1205 or concurrent and MPRT1210 or instructor approval) **(BP/EP) 3 cr**

MGDP1231 PHOTOSHOP (WINDOWS)
This course is designed to give the student basic knowledge and understanding of Adobe Photoshop. The student will be introduced to the operation of tools used in Photoshop. Also included in this course will be an introduction to the use of layers (element layers, layer masks, grouping layers, blending layers and using underlying layers), channels (color and alpha), selections (making, saving and loading), masks (quick masks, saving and editing), color modes, tonal correction (levels and curves), resolution control, file formats, drop shadows, text effects, filters, preparing files for web publication and memory management. (Prereq: MGDP1205 or concurrent and MPRT1210 or instructor approval) **(EP) 3 cr**

MGDP1235 FUNDAMENTALS OF DIGITAL IMAGING
This course is designed to give the learner the best possible solutions to their digital design projects. The student will use a scanner and digital camera to acquire images into Photoshop. Once in Photoshop, the student will learn how the image interacts with resolution, image size, pixel dimension, color modes, enhancement tools, and digital output. The student will also be introduced to the Acrobat PDF format. Included in the coursework is terminology, evaluation of images, acquisition of images, image tonal correction, image transport, and file formats. (Prereq: MPRT1200, MPRT1210, MGDP1205, MGDP1230 or MGDP1231, MGDP1225 or MGDP1226 or instructor approval) **(BP/EP) 2 cr**

Course Descriptions

MGDP1240 ILLUSTRATOR

This course is designed to give the student a basic knowledge and understanding of Adobe's powerful vector based drawing program: Illustrator. The coursework is designed to assist the learner in comprehending creation and manipulation of computer generated illustrations used in the graphic design industry. The learner will start with an introduction to the software and become able to utilize its basic to inter mediate tools and techniques at the end of the course.
(Prereq: MGDP1205 or concurrent and CPLT1200 or instructor approval) **(BP/EP) 3 cr**

MGDP1241 ILLUSTRATOR (WINDOWS)

This course is designed to give the student a basic knowledge and understanding of Adobe's powerful vector based drawing program: Illustrator. The coursework is designed to assist the learner in comprehending creation and manipulation of computer generated illustrations used in the graphic design industry. The learner will start with an introduction to the software and become able to utilize its basic to inter mediate tools and techniques at the end of the course. (Prereq: MGDP1205 or concurrent and CPLT1100 or instructor approval) **(EP) 3 cr**

MGDP1265 HTML USING XHTML

This course is designed to provide the student with the basics of HTML (Hypertext Markup Language). HTML editing tools, document structure, design strategies, and basic tips on good formatting are stressed. Features that will be included are; tables, links, images, style sheets, frames, forms, web safe color, file management and organization. Student will learn how to create a basic web site, check it for compatibility with different web browsers, register a domain name and upload their site to a web server. (Prereq: CPLT1200) **(BP/EP) 3 cr**

MGDP1285 FUNDAMENTALS IN WEB IMAGING

Learn how to scan and edit images for Web pages with success and clarity. Web-safe color issues and image quality will be addressed as well as image maps, rollovers, remote rollovers, transparency, simple animation, tables, buttons, rules and backgrounds. Discover the file formats and tools available to create images with small file sizes for quick download time such as: gif and jpeg. This course will also include cop yright issues as well as hints and tips to find images you can use copyright free. (Prereq: MGDP1230 or MGDP1231, MGDP1265 or equivalent, and CPLT1100 or CPLT1200 or instructor approval) **(BP/EP) 2 cr**

MGDP1300 DIGITAL DESIGN ESSENTIALS

This course is designed to give the student a more in-depth working knowledge of Adobe Photoshop and Illustrator and how they integrate their tools and working space. The student will learn a deeper level of understanding and use of Photoshop and Illustrator. They will learn higher level skills in each of the programs individually, and apply that knowledge as they use their files interchangeably between software packages. (Prereq: MPRT1200, MGDP1205, MGDP1230 or MGDP1231, MGDP1240 or MGDP1241 MMVP1515 and MPRT1210 or instructor approval) **(BP/EP) 3 cr**

MGDP1301 DIGITAL DESIGN ESSENTIALS (WINDOWS)

This course is designed to give the student a more in-depth working knowledge of Adobe Photoshop and Illustrator and how they integrate their tools and working space. The student will learn a deeper level of understanding and use of Photoshop and Illustrator. They will learn higher level skills in each of the programs individually, and apply that knowledge as they use their files interchangeably between software packages. (Prereq: MPRT1200, MGDP1205, MGDP1230 or MGDP1231, MGDP1240 or MGDP1241 MMVP1515 and MPRT1210 or instructor approval) **(EP) 3 cr**

MGDP1310 INDESIGN

InDesign is a professional page layout publishing tool that allows you to integrate text and graphics with unparalleled precision and control. It provides seamless integration with Adobe's other production tools such as Adobe Photoshop and Adobe Illustrator. In this beginning course you will cover the basics of InDesign, as well as master page setup and use, color application, type and paragraph formatting, graphic import, linking and wrapping features, drawing tools, and printing concerns. (Prereq: MGDP1205 or concurrent) **(BP/EP) 3 cr**

MGDP1320 DREAMWEAVER

One of the top industry web design and development tools is Macromedia Dreamweaver. Learning to use this software will enable the student design, manage and upload web sites to Internet servers. The learner will become proficient at putting all the elements of web design together. This will enable them to continually modify the sites they design and interact easily with the servers they employ. (Prereq: MGDP1265 and MGDP1285 or instructor approval) **(BP/EP) 3 cr**

MGDP1325 QUARKXPRESS II

This is an intermediate level QuarkXpress course designed to solidify concepts learned in the introductory level course. This project-based course takes basic skills to the next level and focuses on production standards for using QuarkXpress. Students will be required to create various single and multi-page projects emphasizing their ability to utilize page design, color application, color separation, libraries, style sheets, multi-page/master pages, advanced typographical techniques, and various output devices. (Prereq: MGDP1225 and MGDP1235 or instructor approval) **(BP/EP) 3 cr**

MGDP1326 QUARKXPRESS II (WINDOWS)

This is an intermediate level QuarkXpress course designed to solidify concepts learned in the introductory level course. This project-based course takes basic skills to the next level and focuses on production standards for using QuarkXpress. Students will be required to create various single and multi-page projects emphasizing their ability to utilize page design, color application, color separation, libraries, style sheets, multi-pages/master pages, advanced typographical techniques, and various output devices. (Prereq: MGDP1226 and MGDP1235 or instructor approval) **(EP) 3 cr**

MGDP1360 ACROBAT
Acrobat works on multiple platforms offering flexible, independent viewing content of integrity and consistency. The learner will use Acrobat to repurpose files for multiple uses, including printed pages, web pages, CD Rom/Kiosk and eBook Reader. Instruction in creating PDF files and then taking them to the next level of productivity by adding interactivity, links, bookmarks, forms and searching will be covered. (Prereq: MGDP1235, MGDP1240, MMVP1515 and MPRT1200 or instructor approval) **(BP/EP) 2 cr**

MGDP2000 DIGITAL PUBLISHING/PRODUCTION
The combination of all learning elements in the Graphic Design program is the core to this course. The student will learn how to put a project together from start to finish using the technology and skills learned in previous courses. This course is where the learner applies all acquired knowledge to a project so that it comes together in a portfolio quality printed piece. (Prereq: MGDP1220, MDGP1230 or MGDP1231, MGDP1235, MGDP1300 or MGDP1301, MGDP1325 or MGDP1326, MPRT1200, MPRT1210 and MGDP1360 or instructor approval) **(BP/EP) 3 cr**

MGDP2010 APPLIED GRAPHIC DESIGN
This course incorporates hands-on application of Fundamentals of Graphic Design combined with creativity and tools from software and other lecture courses. The student will develop graphic projects, which will be used later in their portfolio. The learner will have the opportunity to design a body of work from concept to completion. (Prereq: MADV1010, MGDP1205, MGDP1225, MGDP1230 and MGDP1240 or instructor approval) **(BP/EP) 3 cr**

MGDP2100 WEB DESIGN/PRODUCTION
This course is designed for the student to create a portfolio-quality web site from concept to completion. It is not required that the site be large, but that it be well thought out and professional. The student will be expected to implement all previous skills and technical knowledge in Graphic Design, along with any additional knowledge needed to be researched in order in complete the web site by the end of the semester. (Prereq: CCIS1351, MPRT1210, MGDP1220, MADV1000, MADV1010, MGDP1205, MGDP1220, MGDP1230 or MGDP1231, MGDP1240 or MGDP1241, MGDP1265 or CCIS1301, MGEP1285, MGDP1320, MGDP1360, MMVP1515, MMVP1520 or instructor approval) **(BP/EP) 3 cr**

MGDP2200 DESIGN PORTFOLIO
This course will focus on the presentation of portfolio. Student will explore various techniques and strategies for procuring employment with the aid of a professionally designed portfolio. Students will select, customize and finalize their projects and learn proper presentation. Development of resume and interviewing techniques associated with presentation of portfolio will also be covered. (Prereq: Instructor approval) **(BP/EP) 3 cr**

MGDP2215 GRAPHIC DESIGN INTERNSHIP
This course is an individualized internship that focuses on the student's emphasis within the graphic design industry. Each credit purchased equates to 40 hours of on-site industry specific training and is normally taken during the last semester of a student's major. Students participate on-site with professionals and are evaluated by predetermined curriculum objectives that have been agreed upon by the employer, instructor and student. This course provides the student with valuable on-the-job experience, interaction with industry professionals, and preparation for job entry. Students must interview for and acquire their internship site. It is recommended that student seek out instructor expertise for possible recommendation. (Prereq: Instructor approval) **(BP/EP) 1-12 cr**

MHTT1001 TRUCK TECHNOLOGY FUNDAMENTALS
This course is designed to give the student an understanding of truck types and components, personal and shop safety, tool and hardware identification and usage. (Prereq: None) **(BP) 3 cr**

MHTT1010 ELECTRICITY IN TRUCK TECHNOLOGY I
This course is designed to give the student an understanding of electrical circuits, battery, starting, and charging systems. (Prereq: MHTT1001) **(BP) 3 cr**

MHTT1015 ELECTRICITY IN TRUCK TECHNOLOGY II
This course is designed to give the student an understanding of the troubleshooting and repair of advanced electrical circuits and controls. (Prereq: MHTT1010) **(BP) 3 cr**

MHTT1020 VEHICLE SERVICE
This course is designed to give the student an understanding of preventive maintenance, service, adjustment, and inspection of medium and heavy-duty trucks. (Prereq: MHTT1001) **(BP) 3 cr**

MHTT1030 INTERNSHIP/INDUSTRY PARTNERSHIP I
This course will provide the student on-the-job training in the medium/heavy truck industry. The student will use knowledge learned during previous courses and put into practice the technical skills learned on customers' trucks. (Prereq: MHTT1001, MHTT1010, and MHTT1020) **(BP) 5 cr**

MHTT1100 HYDRAULIC BRAKE SYSTEMS
This course is designed to give the student an understanding of operation, maintenance, troubleshooting and repair of hydraulic brake systems. (Prereq: MHTT1001) **(BP) 3 cr**

MHTT1115 AIR BRAKE SYSTEMS AND CONTROLS
This course is designed to give the student an understanding of theory, operation, maintenance, troubleshooting, and repair of air brakes and controls, including ABS brake systems. (Prereq: MHTT1100) **(BP) 3 cr**

Course Descriptions

MHTT1130 INTERNSHIP/INDUSTRY PARTNERSHIP II
This course will provide the student on-the-job training in the medium/heavy truck industry. The student will use knowledge learned during previous courses and put into practice the technical skills learned on customers' trucks. (Prereq: MHTT1100, MHTT1115, and MHTT1200) **(BP) 5 cr**

MHTT1200 STEERING AND SUSPENSION SYSTEMS
This course is designed to give the student an understanding of operation, maintenance, troubleshooting and repair of steering and suspension systems. (Prereq: MHTT1001) **(BP) 3 cr**

MHTT1210 CLUTCH AND DRIVELINE
This course is designed to give the student an understanding of operation, maintenance, troubleshoot, repair and adjustments of clutches, u-joints, and drivelines. (Prereq: MHTT1001) **(BP) 3 cr**

MHTT1300 INTRO TO DIESEL ENGINES
This course is designed to give the student an understanding of diesel engine system operation. Tune-up procedures will be performed on a variety of truck diesel engines. (Prereq: MHTT1001) **(BP) 3 cr**

MHTT1321 HEATING AND AIR CONDITIONING
This course is designed to give the student an understanding of service and repair procedures used on heating and air conditioning systems. (Prereq: MHTT1010) **(BP) 3 cr**

MHTT1330 INTERNSHIP/INDUSTRY PARTNERSHIP III
This course will provide the student on-the-job training in the medium/heavy truck industry. The student will use knowledge learned during previous courses and put into practice the technical skills learned on customers' trucks. (Prereq: MHTT1015, MHTT1300 and MHTT1321) **(BP) 5 cr**

MHTT1401 DIESEL ENGINE II
This course is designed to give the student an understanding of the theory, operation, troubleshooting, and repair of diesel engine intake, exhaust and fuel systems. (Prereq: MHTT1300) **(BP) 3 cr**

MHTT1410 MANUAL TRANSMISSIONS
This course is designed to give the student an understanding of operation and repair of medium and heavy-duty manual transmissions. (Prereq: MHTT1001) **(BP) 3 cr**

MHTT1420 DRIVE AXLES
This course is designed to give the student an understanding of operation and repair of medium and heavy-duty drive axles. (Prereq: MHTT1001) **(BP) 3 cr**

MHTT1430 INTERNSHIP/INDUSTRY PARTNERSHIP IV
This course will provide the student on-the-job training in the medium/heavy truck industry. The student will use knowledge learned during previous courses and put into practice the technical skills learned on customers' trucks. (Prereq: MHTT1210, MHTT1410, and MHTT1420) **(BP) 5 cr**

MHTT1501 DIESEL ENGINE III
This course is designed to give the student an understanding of diesel engine repair and overhaul procedures. (Prereq: MHTT1401) **(BP) 3 cr**

MHTT1511 DIESEL ENGINE IV
This course is designed to give the student an understanding of systems operation, troubleshooting, repair and programming of electronically controlled diesel engines. (Prereq: MHTT1401 and MHTT1501) **(BP) 3 cr**

MHTT1532 INTERNSHIP/INDUSTRY PARTNERSHIP V
This course will provide the student on-the-job training in the medium/heavy truck industry. The student will use knowledge learned during previous courses and put into practice the technical skills learned on customers' trucks. (Prereq: MHTT1401, MHTT1501 and MHTT1511) **(BP) 9 cr**

MMST1100 INTRODUCTION TO MARINE AND MOTOR SPORT TECHNOLOGY
This course will introduce the student to the trade of Marine and Motor Sport technology. Subjects covered will be safety, precision measurement and trade exploration. (Prereq: None) **(EP) 3 cr**

MMST1105 INTRODUCTION TO ENGINE THEORY
This course will include four-cycle and two-cycle engine theory. Also covered will be engine operating theory, performance modifications and failure analysis. (Prereq: None) **(EP) 3 cr**

MMST1110 INTRODUCTION TO FUEL SYSTEMS
This course will cover the theories of fuel and lubrication system operation. Carburetor circuits and basic EFI operation will be covered. Also covered in this course will be lubrication and fuel pumps. (Prereq: None) **(EP) 3 cr**

MMST1115 INTRODUCTION TO ELECTRICAL SYSTEMS
This course will cover basic electrical theories and their application in various situations. Volt/ohmmeter and circuit tester operation will be taught. Battery maintenance and theory will also be part of their course. (Prereq: None) **(EP) 3 cr**

MMST1120 INTRODUCTION TO IGNITION SYSTEMS
This course will cover the magneto, battery and solid state ignition system theories and their operation. Ignition timing methods will be taught also. Coil/condenser tester operation will be part of this course also. (Prereq: MMST1115 or concurrent) **(EP) 3 cr**

MMST1125 SERVICE MANAGEMENT
This course will cover the basics of customer relations, parts lookup, job documentation and the other parts of running a service shop business. (Prereq: None) **(EP) 3 cr**

MMST1130 INTRODUCTION TO DRIVE SYSTEMS
This course will cover the basics of power transmission by belt, chain and gear drives. Lubrication and maintenance will be taught also. (Prereq: None) **(EP) 3 cr**

MMST1135 TUNE-UP AND STORAGE
The basic operations included in a tune-up of any equipment and storage procedures. (Prereq: MMST1105, MMST1110 and MMST1120) **(EP) 3 cr**

MMST1140 ENGINE OVERHAUL
This course will give the student the opportunity to practice the skills learned up to this point and rebuild an engine to factory specifications. (Prereq: MMST1105, MMST1110 and MMST1120) **(EP) 3 cr**

MMST2100 MOTORCYCLE TUNE-UP
This course will give the student the opportunity to apply skills previously used in performing a tune-up on a motorcycle. (Prereq: MMST1105, MMST1110 and MMST1120) **(EP) 3 cr**

MMST2105 MOTORCYCLE TRANSMISSIONS AND CLUTCH SERVICE
This course will cover the theory and operation of motorcycle transmissions. (Prereq: MMST1130) **(EP) 3 cr**

MMST2110 MOTORCYCLE WHEELS AND SUSPENSION
This course will cover motorcycle wheels, tires, brakes and suspension service. Also the different drive systems used in motorcycles will be covered. (Prereq: None) **(EP) 3 cr**

MMST2115 MOTORCYCLE OVERHAUL
In this class the student will rebuild a motorcycle engine to factory specifications. (Prereq: MMST1140 and MMST2100) **(EP) 3 cr**

MMST2120 MOTORCYCLE FUEL SYSTEM SERVICE
This class will cover operation of motorcycle carburetors, fuel pumps, basic fuel injection and maintenance of the fuel system. Carburetor circuits will be traced through different carburetors. (Prereq: MMST1110) **(EP) 3 cr**

MMST2125 MARINE LOWER UNITS
The operation and service of common marine lower units will be covered in this course. Shifting systems and repair procedures will be taught. (Prereq: MMST1130) **(EP) 3 cr**

MMST2130 MARINE COOLING SYSTEMS
This course will cover the operation, maintenance and repair of marine cooling systems. The repair of outboard water pumps will be a part of this course. (Prereq: None) **(EP) 3 cr**

MMST2135 MARINE ELECTRICAL SYSTEMS
This course will cover the electrical systems of common outboard engines and standard marine wiring. Boat wiring is included in this course. (Prereq: MMST1115) **(EP) 3 cr**

MMST2140 MARINE TILT TRIM AND CONTROLS
The tilt and trim systems used on outboards will be covered in this class. Operation and repair of marine remote controls will be included. (Prereq: None) **(EP) 3 cr**

MMST2145 MARINE OVERHAUL
In this course the student will rebuild an outboard engine to factory specifications using skills learned in previous courses. (Prereq: MMST1140) **(EP) 3 cr**

MMST2150 MARINE TUNE-UP
This course will require the student to perform a tune-up on an outboard engine using skills learned in previous classes. (Prereq: MMST1105, MMST1110 and MMST1120) **(EP) 3 cr**

MMST2155 POWER EQUIPMENT ELECTRICAL/IGNITION SYSTEMS
This course is designed to give the student advanced understanding of electrical systems unique to specific outdoor power equipment. (Prereq: MMST1115 and MMST1120) **(EP) 3 cr**

MMST2160 POWER EQUIPMENT FUEL SYSTEMS
This course is designed to give the student advanced understanding of fuel systems unique to specific outdoor power equipment. (Prereq: MMST1110) **(EP) 3 cr**

MMST2165 CHORE PERFORMERS
This course will cover maintenance and repair of a variety of small hand held power equipment, i.e. chain saws, leaf blowers, weed whips and pressure washers. (Prereq: MMST1105, MMST1110 and MMST1120) **(EP) 3 cr**

MMST2170 POWER EQUIPMENT OVERHAUL
This course is designed to give the student hands-on experience with disassembly, identification, and measurement of worn parts. The student will also reassemble and make adjustments to factory specifications. (Prereq: MMST1140) **(EP) 3 cr**

MMST2175 POWER EQUIPMENT DRIVE SYSTEMS
This course is designed to give the student hands-on experience with transmissions, variable drive systems, and clutches, used in the power equipment industry. Disassembly, identification, and measurement of worn parts as well as reassembly and adjustments will be covered. (Prereq: MMST1130) **(EP) 3 cr**

MMST2180 POWER EQUIPMENT ACCESSORY MAINTENANCE
In this course the student will learn how to do basic maintenance and adjustments to accessories such as blade sharpening, mower deck adjustment, cable adjustment, safety switch operation, and belt pulley and bearing replacement. (Prereq: None) **(EP) 3 cr**

Course Descriptions

MMST2185 SNOWMOBILE TUNE-UP
In this course the student will perform tune-up services on a snowmobile using skills learned in previous courses. (Prereq: MMST1105, MMST1110 and MMST1120) **(EP) 3 cr**

MMST2190 SNOWMOBILE DRIVE SYSTEM/CHASSIS SERVICE
This course will teach the basic operating principles of snowmobile drive systems and suspensions. The student will perform this service on a snowmobile. (Prereq: MMST1130) **(EP) 3 cr**

MMST2195 SNOWMOBILE ENGINE OVERHAUL
In this course the student will rebuild a snowmobile engine to factory specifications. (Prereq: MMST1140) **(EP) 3 cr**

MMST2200 I/O TUNE-UP
The student will learn and perform tune-up service on a stern drive boat. Ignition and fuel system maintenance, lubrication and adjustments will be included. (Prereq: MMST1105, MMST1110 and MMST1120) **(EP) 3 cr**

MMST2205 I/O TRANSOM SERVICE
The student will remove, repair, reinstall and adjust a stern drive unit to factory specifications. (Prereq: MMST1130) **(EP) 3 cr**

MMST2210 I/O ENGINE OVERHAUL
The student will remove, disassemble, diagnose, rebuild and reinstall a stern drive engine. (Prereq: MMST1140) **(EP) 3 cr**

MMST2215 PWC ENGINE SERVICE
The student will diagnose, remove, disassemble, and repair a personal watercraft engine to factory specifications. (Prereq: MMST1105, MMST1110, MMST1120 and MMST1140) **(EP) 3 cr**

MMST2220 PWC ELECTRICAL/IGNITION SERVICE
The student will diagnose, troubleshoot and repair personal watercraft electrical or ignition problems. (Prereq: MMST1115 and MMST1120) **(EP) 3 cr**

MMST2225 PWC WATER PUMP SERVICE
The student will service and repair a water pump on a personal watercraft jet drive. (Prereq: None) **(EP) 3 cr**

MMST2230 TEST RUN
This course will cover the accepted test procedures used on all equipment worked on in this program. Trailer handling, boat launching and retrieval will be discussed. (Prereq: None) **(EP) 3 cr**

MMVP1500 CONCEPTS OF MULTIMEDIA
This introductory course will provide the student with an overview of the world of multimedia. The student will be exposed to software and hardware currently being used in the industry and through lectures and projects will explore the role of the graphic artist and computer designer in the design and production of different types of multimedia. (Prereq: None) **(BP) 3 cr**

MMVP1505 VISUAL MEDIA DESIGN
In this course emphasis will be on the basic visual design strategies and techniques used in all types of multimedia presentations. (Prereq: None) **(BP) 3 cr**

MMVP1511 PRODUCTION PLANNING
This course will introduce the student to the process of evaluating client needs and preparing written production documents. The student will explore the varied sources of rental and purchased services, materials and equipment as well as copyright laws as they apply to personal work and the work of others. Students will learn script writing techniques for all types of media. (Prereq: None) **(BP) 4 cr**

MMVP1515 DIGITAL MEDIA TECHNOLOGY
This course is designed to give students a basic knowledge of the technical aspects of the hardware and software used in the digital design world, including digital cameras, scanners, printer, and film recorders, as well as the digitizing and output of video and audio. It includes the basics of file formats and input and output considerations for all types of media. (Prereq: CPLT1100 or CPLT1200) **(BP) 3 cr**

MMVP1520 INTRODUCTION TO FLASH
This course will introduce the basics of creating exciting vector graphic, animation and compelling interactivity webpages for the Internet, using Flash software. (Prereq: MGDP1265 and CCIS1351) **(BP/EP) 3 cr**

MMVP1536 MACROMEDIA DIRECTOR
In this introductory course the student will learn the functions of the Macromedia Director program and its use in the creation of animated and/or interactive sequences appropriate for use in a variety of corporate applications. (Prereq: CPLT1100 or CPLT1200 or instructor approval) **(BP) 4 cr**

MMVP1545 3D STUDIO MAX
This course is designed to give students an introduction to 3D and animation using 3D Studio Max software. Emphasis will be on the tools and techniques used to create and animate 3D images. (Prereq: CPLT1100 or instructor approval) **(BP) 3 cr**

MMVP1551 DIGITAL IMAGE ENHANCEMENT
This course will introduce the student to the concept of electronic image enhancement and its role in photography and video production applications. Students will study basic photography, composition, and lighting and will use both 35 mm and digital cameras to create images for the computer. These images will be electronically changed or enhanced. (Prereq: MGDP1230 or instructor approval) **(BP) 3 cr**

MMVP1560 AUDIO FOR MEDIA
This course will introduce the student to sound for multimedia production and editing. Application software will be used to enhance audio of use in student multimedia and video production projects. (Prereq: None) **(BP) 3 cr**

MMVP1590 MULTIMEDIA FOR THE WEB
In this course students will learn the techniques used to create effective multimedia for the Web and will explore the various animation builders currently in use. (Prereq: None)
(BP) 3 cr

MMVP1600 VIDEO PRODUCTION EQUIPMENT
In this course the student will develop skills and proficiency in the operation of video production equipment. Camera operation, lighting, basic audio and recording equipment are covered. Students will work as a member of a crew. (Prereq: None) **(BP) 4 cr**

MMVP1605 VIDEOGRAPHY AND DIRECTING
In this course students will develop and increase their camera skills, including hand-held operation, ENG and EFP applications. Students will also be introduced to directing techniques, including single camera and multi-camera strategies. (Prereq: Project related beginning courses and instructor approval) **(BP) 4 cr**

MMVP2535 FRACTAL PAINTER
This course is an introduction to the use of Fractal Painter as a tool to create and manipulate images. The main emphasis will be using Fractal Painter software to design and produce visual materials. (Prereq: CPLT1100 or CPLT1200 or instructor approval) **(BP) 3 cr**

MMVP2550 VIDEO FIELD PRODUCTION
This course will give the student fundamental understanding of remote video production. Camera setup, audio techniques and proper lighting on location will be explored. Students will work as a team with this "hands-on" course. (Prereq: MMVP1600 or instructor approval) **(BP) 3 cr**

MMVP2560 AFTER EFFECTS
This course is designed for the advanced student to produce graphics and animations for video projects. The students will use programs such as Adobe After Effects and various 3D animation programs. (Prereq: MMVP2600 or instructor approval) **(BP) 3 cr**

MMVP2570 MEDIA AUTHORING
This course is designed for students who want to enhance their skills with Macromedia Director and DVD authoring applications. Students will create portfolio quality CD-ROMs and DVDs. (Prereq: MMVP1536) **(BP) 4 cr**

MMVP2600 DIGITAL POST-PRODUCTION
In this advanced course students will build on existing non-linear editing skills. Avid's Xpress, MCXpress, Media Composer 1000 and Media 100 software will be used to create digital special effects, titles, animation, and audio tracks. Students will learn how to integrate these elements into a finished video production. (Prereq: Project related beginning courses an instructor approval) **(BP) 4 cr**

MMVP2605 CORPORATE VIDEO PRODUCTION
In this course students will be introduced to the various ways video is used to increase communications and solve training problems in business and industry. Students will complete a training tape and a marketing/promotional video.
(Prereq: Project related beginning courses and instructor approval) **(BP) 4 cr**

MMVP2610 AVID NON-LINEAR EDITING
This advanced course will introduce a student to the Avid non-linear editing system. Students will create video projects for their portfolio. Students will become proficient with the Avid software and hardware interfaces. (Prereq: MMVP1600)
(BP) 3 cr

MMVP2630 ADVANCED PRODUCTION LAB
This course is offered as Pass/No Credit (P/NC). In this course the student will concentrate on advanced research or production methods that are not included in other courses. A training agreement must be signed by the student and instructor at the beginning of the semester. (Prereq: Instructor approval) **(BP) 1-8 cr**

MMVP2641 PORTFOLIO PRODUCTION
This course will provide an opportunity for the student to assemble and prepare the projects that will become part of the student's portfolio. (Prereq: Project related beginning courses and instructor approval) **(BP) 3 cr**

MMVP2650 MULTIMEDIA/VIDEO PRODUCTION INTERNSHIP
This will be a cooperative training program between Hennepin Technical College and a business which allows the student to apply competencies learned in the program to an employment-like work experience. (Prereq: Instructor approval)
(BP) 1-8 cr

MPRT1200 FUNDAMENTALS OF PRINTING
Printing is Minnesota's second largest industry with approximately 1,800 printing and publishing companies employing 60,000 professionals. This course presents the basic information needed by designers, artists or future industry employees. Emphasis is on industry terminology, printing processes, industry requirements and opportunities. Students will build a portfolio show casing over 45 different types of printing. Instruction is through in class lecture and hand on activities assisted by online course activities. (Prereq: CPLT1200)
(BP/EP) 3 cr

MPRT1210 COLOR APPLICATIONS

The need to produce color accurately and consistently in all areas of media communication demands a fundamental understanding of what color is really all about. This course will provide the student with the necessary foundation of color related knowledge. The student will gain a thorough understanding of how we visualize color, the methods used for creating color, principles of color matching and color management, color influences and color phenomena. Students will examine the application of color as seen in nature, artwork photographic films, scanners, cameras, video monitors, television, the web, printing and physical objects. Color space and color models will be covered, including RGB, CMYK, HVC, HLS, HSB, CIELab, YUV, YIQ, Pantone, Munsell, and Web colors. The student will also develop skills to help them identify, analyze, and evaluate color characteristics. Demonstrations, examples, discussions, and hands-on learning will all be utilized to help the student learn. (Prereq: None) **(BP/EP) 3 cr**

MPRT1218 IMAGE ASSEMBLY AND PROOFING

Maintaining the high quality demanded by customers in today's modern printing industry means understanding basic imaging and proofing skills. Students will learn exposure and quality control using log exposure techniques. Images will then be imposed and proofed using photographic proofing materials. Emphasis is on terminology, quality control, problem solving, reproduction methods and techniques. Instruction is combined lecture and hands on lab activities. Online information and materials are used in the course. (Prereq: MPRT1200) **(BP) 3 cr**

MPRT1245 OFFSET PRESS OPERATIONS I

In this course the student will learn about the press related areas of the printing industry. The student will perform hands-on operation of offset press equipment. Platemaking, paper handling, paper feeding, image quality, and press maintenance will all be covered along with an understanding of the functions of each press unit. Students will examine characteristics of printing plates, fountain solution, inks, paper, and digital printing. This course is a beginning level for those pursuing a career in the press/bindery areas of the printing industry. It is also recommended for those interested in areas of prepress, since all prepress operations are based on the capabilities of the pressroom. (Prereq: None) **(BP) 3 cr**

MPRT1250 BINDERY/FINISHING OPERATIONS

In this course the student will learn basic bindery and finishing skills using hands-on training. The student will study paper classifications, characteristics and types, as well as their uses. Students will apply effective techniques for the calculating, handling, and cutting of printing paper. Paper cutting and trimming operations will be enforced by the use of a computerized programmable paper cutter. Students will develop folder skills by performing simple and complex imposition folders, as well as scoring, perfing, and slitting operations. Binding and finishing methods will be explored and the operation of basic stitching, padding, drilling, and binding equipment will be addressed. Students will also examine speciality operations, bookwork planning, and imposition methods. (Prereq: None) **(BP) 3 cr**

MPRT1270 TROUBLESHOOTING THE MACINTOSH

Featuring Mac OS 10.X this course is designed to provide the student with technical information related to the operation of the Macintosh computer. Emphasis will be placed on solving hardware, software and general application problems, understanding the control panel settings; upgrading hardware and software and running diagnostics available for the Macintosh. Other areas to be covered include the proper procedure for adding external or internal devices, installing RAM, installing and preparing a new hard drive, file management techniques and font problems. (Prereq: CPLT1200) **(BP) 3 cr**

MPRT1305 SKILL APPLICATIONS FOR PRINTING AND PREPRESS

In this course advanced students will have the opportunity to apply their knowledge and skills on printing jobs they help produce. Students will participate in the creation and production of printing work under the supervision of an assigned faculty member. Students will demonstrate their skills and understanding of the printing industry and industry processes. Students must have a comprehensive understanding of prepress or press/bindery and need the approval of a faculty member. (Prereq: Instructor approval) **(BP) 3 cr**

MPRT1345 OFFSET PRESS OPERATIONS II

This course is designed to prepare students for a career in the press/bindery areas of the printing industry. Emphasis is placed on multi-color printing and how to achieve quality results. Using hands-on training, the students will print multi-color work, including both spot color and process color. Single-color presses are utilized, enabling the student to gain the necessary knowledge and skills needed for entry in small, medium, or large printing companies. Students will examine various types of screened images and their characteristics, printed tone range, use of special inks, quality control devices, and dot gain. Multi-color platemaking, close color registration, ink densitometry, color bar use, and problem solving will all be stressed. (Prereq: MPRT1245) **(BP) 3 cr**

MPRT1347 MULTI-COLOR PRESS OPERATIONS

The student will obtain hands-on training using multi-color Heidelberg press equipment. Emphasis will be placed on achieving quality results consistent with industry standards using multi-color printing equipment. Students will utilize quality control devices and monitor various aspects of the printed image such as registration, dot gain, ink densitometry, and color balance. Press maintenance and problem solving will be stressed. (Prereq: Instructor approval) **(BP) 3 cr**

MPRT1361 COMPUTER IMPOSITION
PREP's the leading imposition software for the printing industry is featured in this course. Students will master computer imposition skill (electronic stripping) at a basic and advanced level. Single and multiple-page documents simulating customer jobs are created and imposed to industry standards. Our modern Mac lab, featuring the newest systems and software is used in combined lecture and hands-on training. Job preparation for lithographic presswork is taught. Emphasis is placed on job preparation and planning, template construction, imposition styles, output setup and high level problem-solving skills. Online activities are used as part of the instruction. (Prereq: MGDP1225) **(BP) 3 cr**

MPRT1376 PDF WORK FLOW
Today's modern prepress industry is rapidly heading toward a total PDF based work flow. Students in this class will learn Trapping, Imposition, Preflighting and Distillation processes using the Creo Prinergy System. Job preparation for lithographic press work will be done using hands-on training in our high-tech computer lab. Proofs will be produced by both laser printing and digital color proofing. (Prereq: MPRT1200) **(BP) 3 cr**

MPRT2212 PROFESSIONAL SCANNING
Scanning involves high quality digital imaging that maintains or improves the lifelike color and fidelity of customer artwork. Customers or prepress technicians preparing work for the printing industry must know how to get the most from the scanning equipment and software. This course includes basic and advanced scanning skills using industry quality equipment. Topics such as tone control, setting black point/white point, dot range, UCR and GCR and covered in depth. Instruction is combined lecture and hands-on activities in our modern prepress computer lab. Online activities are included as part of the course. (Prereq: MGDP1225 and MGDP1230) **(BP) 3 cr**

MPRT2400 PRINTING INTERNSHIP
This will be a cooperative training program between Hennepin Technical College and a printing company. The student will apply competencies learned in the program to an employment-like work experience. Tasks and course goals will be determined by the instructor and the job-site supervisor on an individual student basis. (Prereq: Completion of two thirds of the diploma credits and instructor approval) **(BP) 1-8 cr**

MPRT2401 OFFSET PRESS/DUPLICATOR OPERATOR INTERNSHIP
This will be a cooperative training program between Hennepin Technical College and a printing company. The student will apply competencies learned in the program to an employment-like work experience. Tasks and course goals will be determined by the instructor and the job site supervisor on an individual student basis. (Prereq: Instructor approval) **(BP) 4 cr**

MPRT2405 COLOR PREPRESS INTERNSHIP
This will be a cooperative training program between Hennepin Technical College and a printing company. The student will apply competencies learned in the program to an employment-like work experience. (Prereq: Completion of two thirds of the diploma credits and instructor approval) **(BP) 1-16 cr**

NURS0110 NURSING ASSISTANT WRITTEN TEST
This is an examination process which is necessary for registration of nurses aides employed in long-term care facilities. The examination consists of two parts; a written evaluation and a skills evaluation. This evaluation is designed to objectively measure nurses aide candidate's knowledge and skills and to ensure minimal entry-level competency in the field. Individuals successfully completing this examination are placed on the Minnesota Nursing Assistant Registry. (Prereq: None) **(BP/EP) 0 cr**

NURS0115 NURSING ASSISTANT WRITTEN-RETAKE
This is a retake examination process which is necessary for registration of nurses aides employed in long-term care facilities. The retake examination consists of two parts; a written evaluation and a skills evaluation. This evaluation is designed to objectively measure nurses aide candidate's knowledge and skills and to ensure minimal entry-level competency in the field. Individuals successfully completing this examination are placed on the Minnesota Nursing Assistant Registry. (Prereq: None) **(BP/EP) 0 cr**

NURS0120 NURSING ASSISTANT SKILLS TEST
This is an examination process which is necessary for registration of nurses aides employed in long-term care facilities. The examination consists of two parts; a written evaluation and a skills evaluation. This evaluation is designed to objectively measure nurses aide candidate's knowledge and skills and to ensure minimal entry-level competency in the field. Individuals successfully completing this examination are placed on the Minnesota Nursing Assistant Registry. (Prereq: None) **(BP/EP) 0 cr**

NURS0125 NURSING ASSISTANT SKILLS-RETAKE
This is a retake examination process which is necessary for registration of nurses aides employed in long-term care facilities. The retake examination consists of two parts; a written evaluation and a skills evaluation. This evaluation is designed to objectively measure nurses aide candidate's knowledge and skills and to ensure minimal entry-level competency in the field. Individuals successfully completing this examination are placed on the Minnesota Nursing Assistant Registry. (Prereq: None) **(BP/EP) 0 cr**

NURS0130 HOME HEALTH AIDE WRITTEN TEST
This examination focuses on the role of nursing assistants in home care. Upon successfully completing this examination the individual is placed in the Minnesota Nursing Assistant/Home Health Aide Registry. (Prereq: None) **(BP/EP) 0 cr**

NURS0140 HOME HEALTH AIDE WRITTEN-RETAKE

This retake examination focuses on the role of nursing assistants in home care. Upon successfully completing this examination the individual is placed in the Minnesota Nursing Assistant/Home Health Aide Registry. (Prereq: None) **(BP/EP) 0 cr**

NURS1001 NURSING ASSISTANT

This course introduces concepts of basic human needs, health/illness continuum and basic personal care skills. It includes theory with skills demonstrated in a supervised laboratory setting and 24 hours of clinical care of selected adult patients in a long-term care setting. The role of the nursing assistant in a long term care facility as well as working with various populations is discussed. Upon successful completion of this course the candidate is eligible to take the Minnesota Competency Evaluation for Nursing Assistants. Individuals successfully completing this examination are placed on the Minnesota Nursing Assistant Registry. (Prereq: Qualifying score on CPT reading comp and listening assessment test, or equivalent. The ability to lift and move 25-50 pounds. Full-time attendance is required at all sessions) **(BP/EP) 4 cr**

NURS1020 TRAINED MEDICATION AIDE

This state-approved program provides an overview of the requirements concerning medications and their administration. Other topics include legal criteria, medical abbreviations, measurements, use of the Physician's Desk Reference (PDR), and overview of body systems and drug classifications. Administration of medications via oral, eye, ear, rectal, and topical routes will also be covered. Attendance of all classes is mandatory; any absence will result in repeating the course. Students must attain 90% on all examinations to continue in the class. Students who do not attain 90% in the retake exam may continue to attend the lecture portion of the class but may not test and will receive a failing grade. (Prereq: NURS1001) **(BP/EP) 2 cr**

NURS1101 CLINICAL I (ACUTE CARE)

This clinical course provides opportunity for the student to apply skills and theory in an acute patient care setting under faculty supervision. Students will care for selected adult patients (18-65+ years) having chronic or acute illnesses. Medication administration and selected nursing skills are evaluated. Absence on the orientation day at the clinical site for any reason will result in being dismissed from the entire clinical rotation. The clinical may be rescheduled the following semester. (Prereq: High School diploma or GED. EN GL2120, MATH1000, NURS1001 or equivalent, NURS1111, NURS1120 NURS1130, NURS1141, NURS1151, NURS1161 and NURS1191. Prerequisite or concurrent: NURS1241 and NURS1261. Successful completion of pre-clinical math test with a score of 90% or better; the ability to lift and move 25-50 pounds; current CPR for Health Care Providers; negative Mantoux or Chest X-ray; Physical Exam/Immunization records on school file) **(BP/EP) 4 cr**

NURS1103 CLINICAL I (LTC)

This clinical course provides opportunity for the student to apply skills and theory in a long-term care setting under faculty supervision. Students will care for selected adult patients/residents 60 years and older having chronic or acute illnesses. Medication administration and selected nursing skills are evaluated. Absence on the orientation day at the clinical site for any reason will result in being dismissed from the entire clinical rotation. The clinical may be rescheduled the following semester. (Prereq: High School diploma or GED. ENGL2120, MATH1000, NURS1001 or equivalent, NURS1111, NURS1120 NURS1130, NURS1141, NURS1151, NURS1161 and NURS1191. Prerequisite or concurrent: NURS1241 and NURS1261. Successful completion of pre-clinical math test with a score of 90% or better; the ability to lift and move 25-50 pounds; current CPR for Health Care Providers; negative Mantoux or Chest X-ray; Physical Exam/Immunization records on school file) **(BP/EP) 4 cr**

NURS1111 ANATOMY AND PHYSIOLOGY

This course assists the student to understand the basics of anatomy and physiology of the human body. This course follows the organization of the body from a single cell to the coordinated whole, including ten body systems. Principles of infectrol control and basic concepts of nutrition are also included in the course. This course may be of fered on-line or web-enhanced. (Prereq: High School diploma or GED or concurrently enrolled under the PSEOP. Qualifying score on CPT reading and English assessment test, or equivalent) **(BP/EP) 5 cr**

NURS1120 MEDICAL TERMS

This course is designed to acquaint the nursing student with medical terminology. Students learn to construct words using medical roots, prefixes, and suffixes, as well as learn to pronounce and spell medical terminology. This course may be offered on-line or web-enhanced. (Prereq: High School diploma or GED or concurrently enrolled under the PSEOP. Qualifying score on CPT reading and English assessment test, or equivalent) **(BP/EP) 1 cr**

NURS1130 INTRODUCTION TO PRACTICAL NURSING

The Introduction to Practical Nursing course will provide an opportunity for the nursing student to lean about and adopt techniques that will assist them in being successful in the nursing program. Topics include nursing program expectations, study and test taking techniques, learning styles, nursing ethics and boundaries, campus resources, diversity and its impact in nursing, communication techniques and opportunities, personal goal setting, time and stress management, introduction to the Minnesota Board of Nursing. (Prereq: High School diploma or GED. Qualifying score on CPT reading and English assessment test or equivalent) **(BP/EP) 1 cr**

NURS1141 PHARMACOLOGY FOR PRACTICAL NURSES

Nursing skills and theory related to the general principles of medication preparation and administration are discussed. The student learns to set up and solve problems involving altered medication doses using metric, apothecary, household systems and conversion tables. Terminology and abbreviations required to interpret medication orders are emphasized. Techniques of preparation and administration of medication via oral, topical, and parenteral routes are discussed and practiced. Intravenous therapy will be demonstrated. Practice and evaluation in a skills lab is required in preparation for clinical participation. (Prereq: High School diploma or GED. ENGL2120, MATH1000, 8-hour CPR (Health Care Providers) or SSCI1020, NURS1001, NURS1111, NURS1120 and NURS1130. Prerequisite or concurrent: NURS1151, NURS1161 and NURS1191) **(BP/EP) 4 cr**

NURS1143 INFECTION CONTROL

Utilizing a fully on-line course format, the student will learn about different infectious organisms and their influence over the human body. The student will discover the body's complex defense mechanisms that are essential for survival. Methods to enhance immunity and assist in the prevention and spread of disease will be learned. (Prereq: High School diploma or GED) **(BP/EP) 1 cr**

NURS1151 PHASES OF ADULTHOOD

This course will explore the theories of development and established growth patterns from young adulthood through old age. Topics include cognitive, psychosocial and physical development. The human response to death and dying at each stage is analyzed. In addition, this course will explore pathophysiology related to ageing and nursing care adaptations for the older client. (Prereq: High School diploma or GED. ENGL2120, MATH1000, 8-hour CPR (Health Care Providers) or SSCI1020, NURS1001, NURS1111, NURS1120 and NURS1130. Prerequisite or concurrent: NURS1141, NURS1161 and NURS1191) **(BP/EP) 2 cr**

NURS1161 NURSING SKILLS I

This Practical Nursing skills course builds a foundation of skills and knowledge within the scope of the nursing process, emphasizing critical thinking. We will teach basic data collection and nursing documentation in the areas of lungs and bowel sounds, CMS, and apical heart rate. Oxygen administration, sterile technique, tracheostomy and upper airway suctioning and urinary catheterization will be demonstrated. Practice and performance evaluation in the nursing skills lab is required before clinical participation. (Prereq: High School diploma or GED. ENGL2120, MATH1000, 8-hour CPR (Health Care Providers) or SSCI1020, NURS1001, NURS1111, NURS1120 and NURS1130. Prerequisite or concurrent: NURS1141, NURS1151 and NURS1191) **(BP/EP) 3 cr**

NURS1180 NUTRITION

This course will utilize a fully on-line format. This course explores the basic principles of nutrition and the relationship between nutrition and health. After studying specific nutrients and guidelines for nutritious meals, the student will evaluate his/her own dietary intake. Food-related illnesses, consumer nutrition and trends as well as food regulatory agencies are included. (Prereq: High School diploma or GED) **(BP/EP) 1 cr**

NURS1191 ADULT NURSING I

This course discusses the following body systems as they relate to health and disease: endocrine; hematology; respiratory; cardiovascular; musculoskeletal/orthopedics and oncology. Explanations of disease processes and related symptoms are described. Nutrition as it relates to these systems is discussed. Emphasis is on the practical nurse's role in diagnostic testing, intervention, treatment and related pharmacology. (Prereq: High School diploma or GED. ENGL2125, MATH1000, 8-hour CPR (Health Care Provider) or SSCI1020, NURS1001 or equivalent, NURS1111, NURS1120 and NURS1130. Prerequisites or concurrent: NURS1141, NURS1151 and NURS1161) **(BP/EP) 4 cr**

NURS1201 CLINICAL II (ACUTE CARE)

This clinical course provides opportunity for the student to apply skills and nursing theory in an acute patient care setting under faculty supervision. Faculty evaluate students' performance of nursing skills, designated medical treatments and medication administration for patients between the ages of 18 and 65 + years. Development of organizational skills in the management of a multiple patient care assignment (2 or more patients) is required during this clinical rotation. Absence on the orientation day at the clinical site for any reason will result in being dismissed from the entire clinical rotation. The clinical may be rescheduled the following semester. (Prereq: High School diploma or GED. ENGL2120, MATH1000, NURS1001 or equivalent, NURS1111, NURS1120, NURS1130, NURS1141, NURS1151, NURS1161 and NURS1191. NURS1103 must have been completed within the last 9 months. Prerequisite or concurrent: NURS1241 and NURS1261; successful completion of pre-clinical math test with a score of 90% or better; ability to lift and move 25-50 pounds; current CPR (Health Care Provider); negative Mantoux or Chest X-ray and Physical Exam/Immunization records on school file) **(BP/EP) 4 cr**

NURS1203 CLINICAL II (LTC)

This clinical course provides opportunity for the student to apply skills and nursing theory in a long-term care setting. Faculty evaluates students' performance of nursing interventions, delegated medical treatments, and medication administration for patients/residents 60 years and older. The practical nurse's leadership role in this setting is observed and practiced as appropriate. A multiple patient care assignment (2 or more patients) is required during this clinical rotation. Absence on the orientation day at the clinical site for any reason will result in being dismissed from the entire clinical rotation. The clinical may be rescheduled the following semester. (Prereq: NURS0400, NURS1130, NURS1141, NURS1151, NURS1161 and NURS1191. NURS1101 must have been completed within the last 9 months. Prerequisite or concurrent: NURS1241, NURS1261 and NURS2110; successful completion of pre-clinical math test with a score of 90% or better; ability to lift and move 25-50 pounds; current CPR (Health Care Provider); negative Mantoux or Chest X-ray; immunization records on school file) **(BP/EP) 4 cr**

NURS1221 ADULT NURSING II
This course discusses the following body systems as they relate to health and disease: digestion and accessory organs; reproduction; genitourinary; integumentary and neurosensory. Explanations of disease processes and related symptoms are described. Nutrition as it relates to these systems is discussed. Emphasis is on the practical nurse's role in diagnostic testing, intervention, treatment and related pharmacology. (Prereq: NURS1101 or NURS1103, NURS1191, NURS1241 and NURS1261. Prerequisite or concurrent: NURS1201 or NURS1203 and NURS2110) **(BP/EP) 3 cr**

NURS1241 MATERNAL CHILD NURSING
This course discusses the nature of pregnancy, fundamental principles of labor and delivery, and the nursing care of the healthy mother and newborn as well as the care of mother and child experiencing common complications. Growth and development concepts from fetal development through adolescence are discussed. Nutrition during pregnancy, lactation and in childhood is identified. Conditions and situations discussed include the following: well-child care; acute, chronic, and congenital disorders; related signs and symptoms; medical treatment and nursing interventions. The importance of family-centered care is analyzed. (Prereq: High School diploma or GED. ENGL2120, MATH1000 or equivalent, NURS1111, NURS1120, NURS1130, NURS1141, NURS1151, NURS1161, NURS1191 and NURS1261 or concurrent) **(BP/EP) 3 cr**

NURS1261 NURSING SKILLS II
This course builds upon knowledge presented in Nursing Skills I. Discussion of the LPN's role in the nursing process, problem solving and critical thinking that focuses upon documentation in the clinical setting is also introduced. Complex nursing theory and skills are discussed. Students explore the LPN's role in pre/post-op care, dressing changes, care of complex patients/clients having drainage tubes, neurological checks, ear cleansing, nasogastric suction and nasogastric tube feedings. Practice and evaluation in a skills lab is required in preparation for clinical participation. (Prereq: High School diploma or GED. ENGL2120, MATH1000, NURS1111, NURS1120, NURS1130, NURS1141, NURS1151, NURS1161 and NURS1191) **(BP/EP) 3 cr**

NURS1400 SCHOOL HEALTH PARAPROFESSIONAL I
This course covers information for the school health paraprofessional to function in a school district under the direction of a licensed school nurse. Topics include an overview of school health programs, health room management and screening programs. Basic child and adolescent growth/development, communication skills and working with special populations is also discussed. (Prereq: High School diploma or GED) **(BP/EP) 2 cr**

NURS1410 SCHOOL HEALTH PARAPROFESSIONAL II
This course covers expanded information to include developmental disabilities, medical conditions, community resources, state and local policies and procedures and the role of the School Health Para Professional as a member of the school health team. (Prereq: High School diploma or GED and NURS1400) **(BP/EP) 1 cr**

NURS2110 PSYCHOSOCIAL NURSING
This course expands the students understanding of human behavior to include both adaptive and maladaptive behavior. The student develops an understanding of mental health and illness issues such as mental disorders, chemical abuse and domestic violence and abuse. Nursing implications as well as psychotropic medications are defined. Therapeutic interactions and culturally congruent nursing care are addressed. (Prereq: NURS1141, NURS1161, and NURS1101 or NURS1103) **(BP/EP) 2 cr**

NURS2120 PREPARATION FOR PRACTICE
This course addresses current legal responsibilities and accountabilities of the Licensed Practical Nurse in the state of Minnesota based on the Minnesota Nurse Practice Act and the Minnesota Board of Nursing Rules Related to the Nurse Practice Act. A review test for NCLEX-PN will be given to help students identify strengths and areas of concern in preparation for the licensing (i.e. state board) examination. (Prereq: Concurrent with NURS2300 or NURS2400) **(BP/EP) 1 cr**

NURS2300 CLINIC NURSING
This community-based clinical will give students the opportunity to learn at a family practice clinic, applying nursing theory and skills learned in previous courses. Students observe, collect data and assist with treatment of clients (ages birth to older adult) in an outpatient care setting. Care is provided to both healthy and ill clients. The role of the practical nurse is the focus of this clinical. (Prereq: NURS1241, NURS1261, NURS1201 or NURS1203. Prerequisite or concurrent: NURS1221 and NURS2110; successful completion of pre-clinical math test with a score of 90% or better; the ability to lift and move 25-50 pounds; current CPR for Health Care Providers; negative Mantoux or Chest X-ray; Clinical II repeated if it has been greater than 9 months since completion of NURS1201/NURS1203) **(BP/EP) 2 cr**

NURS2400 INTEGRATED PRACTICUM
Students, with the assistance of faculty, have opportunity to choose a clinical experience from available sites. Students are expected to select an experience that reflects their interests. The focus is on self-motivation, self-awareness and interdependence as well as on applying theory to practice. The experience is self-directed under the guidance of facility staff and nursing faculty monitoring. (Prereq: NURS1241, NURS1261, NURS1201 or NURS1203 and NURS2300. Prerequisite or concurrent: NURS1221 and NURS2110; successful completion of pre-clinical math test with a score of 90% or better; the ability to lift and move 25-50 pounds; current CPR for Health Care Providers; negative Mantoux or Chest X-ray; Clinical II repeated if it has been greater than 9 months since completion of NURS1201/NURS1203 and/or NURS2300) **(BP/EP) 2 cr**

NURS2600 NCLEX - PN REVIEW
This course is designed for the graduate practical nursing student. The focus is on reviewing nursing knowledge in preparation for the NCLEX-PN examination. Content includes a review of the following: body systems in health and disease; health promotion and maintenance from infancy through adulthood, pharmacology, issues that promote a safe and effective care environment and maintaining psychosocial integrity. (Prereq: Successful completion of a practical nursing program) **(EP) 2 cr**

OFCR1301 MEDICAL TERMINOLOGY
This course covers the introduction to word analysis and construction with usage of word roots, prefixes and suffixes. Emphasis will be placed on definition, pronunciation, and spelling of roots, prefixes, suffixes and medical words. (Prereq: None) **(BP/EP) 4 cr**

OFCR1306 ANATOMY/PHYSIOLOGY/DISEASE CONDITION
This course covers the introduction to human anatomy which includes the study of diseased anatomical systems. Emphasis is on terminology, abbreviations, medications, and symptomatic, diagnostic and operative terms. (Prereq: OFCR1301) **(BP/EP) 4 cr**

OFCR1315 MEDICAL OFFICE PROCEDURES
This is an introductory course to medical office procedures. It will include telephone etiquette, customer service, appointment scheduling, medical records management, and insurance and reimbursement methodologies. Legal and ethical issues applicable to health information will also be addressed. (Prereq: CPLT1005 and OFCR1301) **(BP/EP) 4 cr**

OFCR1321 ICD-9CM MEDICAL CODING
This course is intended for individuals currently working in clinical health care settings and insurance offices whose activities require the use of ICD-9-CM, a national level diagnostic coding system. Basic coding steps and guidelines will be applied in coding exercises organized by body systems. (Prereq: OFCR1301 and OFCR1306) **(BP/EP) 4 cr**

OFCR1326 CPT-4 MEDICAL CODING
This course is intended for individuals currently working in clinical health care settings and insurance offices whose activities require the use of CPT procedural coding. This course includes an overview of CPT coding rules, current evaluation and management codes and the principles of complete and accurate CPT coding. Exercises and case studies will be used to demonstrate requirements for accurate coding. (Prereq: OFCR1301 and OFCR1306) **(BP/EP) 4 cr**

OFCR1331 MEDICAL TRANSCRIPTION I
This course will introduce the student to transcription of medical reports. Emphasis will be placed on the use of transcription equipment, use of reference material, formats, and proofreading. The student will transcribe office notes, procedural notes, consultative and emergency service medical reports, history and physicals, operative notes, discharge summaries, and patient correspondence. (Prereq: CCIS1035, ENGL1010, OFCR1301, OFCR1306; a 45NWPM typing speed as documented on a 5-minute timed writing) **(BP/EP) 4 cr**

OFCR2331 MEDICAL TRANSCRIPTION II
This course includes transcription of dictated medical material into a variety of usable medical documents. Emphasis will be on building speed and accuracy, proofreading and correcting errors. Students will work on simulated physician dictations in five medical specialty areas. (Prereq: OFCR1331 and a 55NWPM typing speed as documented on a 5-minute timed writing) **(BP/EP) 4 cr**

OFCR2800 MEDICAL OFFICE CAREERS INTERNSHIP
This course provides an internship to allow the student to apply classroom instruction to an actual work situation as well as to make important career contacts in industry. The internship takes place during the last quarter and enables the student to pursue a specific career goal. (Prereq: Instructor approval) **(BP/EP) 1-6 cr**

PHIL2100 CRITICAL THINKING
The purpose of this course is to develop the critical and creative thinking skills of each student. The course is built on the assumption that the best way to develop thinking skills is by continual guided and independent practice. Therefore, each lesson will include two key components, or parts: teacher presentation and student practice. In the presentations, the teacher will explain and demonstrate new thinking techniques. Students practice will be both guided and independent. After presenting new techniques, the teacher will guide students in practice sessions using those new techniques. And then to demonstrate that they have mastered the new techniques, students will complete assignments and tests. (Prereq: Qualifying score on English assessment test OR ENGL0910) **(BP/EP) 3 cr**

PHIL2200 ETHICS
This course introduces students to the field of ethics. The development of ethical standards is explored as related to the individual, government, business, and society. Current legislation is examined from the perspective of its moral and ethical roots. Course focuses on ethical consideration and standards influencing personal and business decisions. This course will also focus on the nature of ethical thought and its impact on others. (Prereq: Qualifying score on English assessment test OR ENGL0910) **(BP/EP) 3 cr**

PLST1008 FUNDAMENTALS OF PLASTICS/CHEMISTRY AND INGREDIENTS

This course is designed to introduce the student to the historical introduction to plastics, details about natural plastics, current status of the plastics industry, U.S. consumption of major materials, recycling, disposal and significant organizations within the industry. This course includes fundamentals of health and safety, their correction and prevention, reading and understanding MSDS and safe handling of chemicals and materials. This course includes basic principles of polymer chemistry, molecules and chemical bonds, polymerization types, melt index values and molecular structures. This course includes focusing on those special ingredients used to alter and enhance plastics. Most plastic products consist of a polymeric material that has been altered to change or improve selected properties. (Prereq: None) **(BP) 4 cr**

PLST1037 MACHINING/FINISHING AND FABRICATION PROCESSES

This course is designed to introduce the student to the basic machining and finishing of plastic materials. Students will learn how plastics and composites are machined and finished. This course includes fabrication processes designed to introduce the student to adhesion, cohesion, mechanical fastening and friction fitting methods by which plastics are bonded. (Prereq: None) **(BP) 4 cr**

PLST1041 INTRODUCTION TO PLASTICS MOLDING PROCESSES

This course is designed to introduce the student to the major molding processes used in converting plastics (polymers) materials into products. This course includes injection molding, molding liquid materials, molding granular thermoset materials, extrusion equipment, compounding, major types of extrusion products, blow molding, thermoforming techniques and rotational (casting) molding processes. (Prereq: None) **(BP) 3 cr**

PLST2007 PROPERTIES AND TESTS OF SELECTED PLASTICS

This course is designed to introduce the student to the fundamental methods of identifying plastics, laboratory testing of plastic materials and the testing specifications and measurement systems used in the plastics industry. (Prereq: None) **(BP) 4 cr**

PLST2011 EXTRUSION MOLDING PROCESSES I

This course is designed to introduce the student to extruder operation and control - Single Screw, this course teaches the fundamentals of single screw technology, including all of the knowledge that personnel must understand in order to make informed decisions on the production floor. This course includes sheet extrusion technology designed to be used in conjunction with the nine lesson single screw extrusion program mentioned. Personnel from machine operators through process engineers will find valuable information to help make their work and the sheet extrusion process more efficient. This course is recommended for extruder operators, material handlers, setup personnel, production supervisors, process engineers and extrusion technicians. This course utilizes and interactive training program using CD-ROM based courseware (software). Set up, operation and troubleshooting of several extrusion dies and down stream equipment will be emphasized. (Prereq: None) **(BP) 3 cr**

PLST2016 EXTRUSION MOLDING PROCESSES II

This course is a continuation of Extrusion Molding Processes I and is designed to introduce the student to compounding with the twin screw extruder. This course is recommended for twin screw extruder operators, material handlers, setup personnel and production supervisors. Compounding with the twin screw extruder is a twin screw training course that delivers twin benefits, from basic operations to advanced troubleshooting. Employees learn about machines and about plastic behavior - another benefit improves productivity and quality while reducing waste. This course includes plastic drying technology, many of today's engineering grade reasons and other moisture sensitive materials must be dried prior to processing. Absorbed and surface moisture must be removed to avoid molded part splay and plastic degradation. Plastic drying is one of the most misunderstood technologies on the mold floor. This course is recommended for material handlers, setup personnel, foremen process engineers, production supervisors molding managers and QA personnel. This course utilizes an interactive training program using CD-ROM based courseware (software). Set up, operation, and troubleshooting of several extrusion molding dies, extrusion molding down stream equipment, and extrusion molding materials to produce a quality product will be emphasized. (Prereq: PLST2011) **(BP) 3 cr**

PLST2127 INJECTION MOLDING PROCESS I

This course is designed to introduce the student to basic injection molding machine operations. Content includes molding machine parts and operation, operator responsibilities, safe practices, and identifying part defects. This course includes basic injection molding and covers fundamentals of injection molding technology. This course also includes Plastic Drying Technology, many of today's engineering grade resins and other moisture-sensitive materials must be properly dried prior to processing. This course also includes SkillBuilder basic injection molding lab, a brand new technology that combines CD-based, interactive courseware (Basic Injection Molding lessons 1-5) with a dramatically realistic injection molding machine simulator. This course also includes advanced injection molding which covers essential information for those who must understand molding technology at the expert level. Emphasis is on building an in-depth understanding of the relationships between machine controls, plastic behavior during molding and finished part properties. This course includes optimizing machine control settings 1, 2, 3, and 4. This course utilizes an interactive training program using CD-ROM based courseware (software). (Prereq: None) **(BP) 3 cr**

PLST2137 INJECTION MOLDING PROCESS II

This course is a continuation of Injection Molding Process I and is designed to introduce the student to SimTech, the injection molding machine simulator. This course also includes Efficient Mold Setting, a two session program designed to instruct employees on proper mold storage, installation, start-up, safety, and shut-down procedures. The program is directed toward set up, mold maintenance, and machine operating personnel. This course includes Injection Molded Part Problems and Solutions. This program teaches injection molders, mold designers and part designers, process engineers, production supervisors, and molding managers how to correct the most common and costly molded part problems. Part defects are described and analyzed to show how each develops. The machine control adjustments and/or tooling and part design changes necessary to correct defects are explained in detail. Topics also include an explanation for the cause and effect method of problem analysis - a very valuable technique for analyzing and solving all types of production and management problems. This course utilizes an interactive training program using CD-ROM based courseware (software). Set up, operation, and troubleshooting of several molds to produce a quality product will be emphasized. (Prereq: PLST2127) **(BP) 3 cr**

PLST2142 INJECTION MOLDING PROCESS III

This course is a continuation of Injection Molding Process II and is designed to introduce the student to set up, operation, and troubleshooting of several types of injection molding machines, injection molds, and injection molding materials to produce quality plastic molded parts. Optimization of setting and starting the mold will be emphasized. (Prereq: PLST2137) **(BP) 3 cr**

PLST2150 DESIGN OF EXPERIMENTS (DOE) FOR INJECTION MOLDING

This course is intended to introduce the student to the Design of Experiments (DOE) process for Injection Molding. Content includes an overview of how to develop an experiment by explaining common terminology and exploring various DOE techniques, all in injection molding environment. This course utilizes DOE Wisdom Jr. Software, which helps you properly layout the experiments and the book, Design of Experiments for Injection Molding to further enhance your understanding of DOEs. This course also utilizes an interactive training program using CD-ROM based courseware (software). Set up, operation, and optimization of an injection molding process to produce a quality product will also be emphasized. (Prereq: None) **(BP) 4 cr**

PLST2300 PLASTICS MANUFACTURING TECHNOLOGY INTERNSHIP

This course provides students with an internship experience in Plastics. Students are evaluated by predetermined curriculum objectives agreed upon by the employer, instructor and student. The student is expected to interview for and acquire an internship site. (Prereq: Instructor approval) **(BP) 4 cr**

PRPO1010 INTRODUCTION TO 35MM CAMERA OPERATIONS

This course will focus on basic camera handling techniques of the 35mm camera. The course will introduce the student to the features, advantages and disadvantages of the 35mm camera as well as meter usage and exposure control, lens selection and composition. (Prereq: None) **(EP) 3 cr**

PRPO1030 BLACK AND WHITE PHOTOGRAPHY

This course will introduce the student to both the theory and practical application of black and white processing and printing as well as the photo chemical process. Course emphasis is on the fundamentals of black and white film and paper processing, proof printing, projection printing, print finishing and presentation techniques. (Prereq: PRPO1010) **(EP) 3 cr**

PRPO1050 AMBIENT LIGHTING CONTROLS

This course will introduce the student to both the theoretical and practical applications of controlling the photographers most important tool, light! The course will go deeply into the control of direction, quantity, quality, ratio and color of light for outdoor (natural) and interior (existing) lighting. (Prereq: PRPO1010 or concurrent) **(EP) 2 cr**

PRPO1070 PHOTOGRAPHIC DESIGN

This course will introduce the student to the theory as well as the practical applications of controlling the aesthetics of a photographer's final product, the photograph! Emphasis will be placed on developing the compositional elements in the camera's viewfinder prior to shooting and developing the ability to "see" photographically. (Prereq: None) **(EP) 3 cr**

PRPO1150 PHOTOGRAPHIC PROCESSES

This course will introduce the student to the various chemical photographic processes used today. The student will deal with process monitoring, densitometry and all issues pertaining to photographic chemistry. Operation of B&W, E-6, C-41 and RA-4 processes will be covered. (Prereq: None) **(EP) 3 cr**

PRPO1170 PHOTOGRAPHER'S ASSISTANT

This course will introduce the student to the practical duties and responsibilities of a professional photographer's assistant. Emphasis will be placed on the actual performance of photo shoots both in the studio and on location. (Prereq: None) **(EP) 3 cr**

PRPO1200 STUDIO LIGHTING

This course will introduce the student to the use of studio tungsten and studio strobe lighting equipment. The emphasis will be on furthering the student's understanding and control of the photographer's most important tool, light! (Prereq: PRPO1050 or instructor approval) **(EP) 3 cr**

PRPO1220 BASIC COLOR PRINTING
This course will introduce the student to the color theory and practical applications of color contact and projection printing from color negatives. Expanded skills in corrective techniques will be covered as well as color print finishing techniques. (Prereq: PRPO1030) **(EP) 3 cr**

PRPO1240 BEGINNING PORTRAITURE
This course is designed to introduce the student to the basic techniques of portrait photography. Emphasis is placed on lighting and posing individuals and couples as well as corrective portrait techniques. (Prereq: PRPO1010 and PRPO1050) **(EP) 3 cr**

PRPO1260 MEDIUM FORMAT PHOTOGRAPHY
This course is designed to introduce the student to the use of medium format cameras. Course emphasis is on shooting to assignment criterion that creatively uses and controls the medium format camera. (Prereq: PRPO1010) **(EP) 3 cr**

PRPO1280 LARGE FORMAT PHOTOGRAPHY
This course is designed to introduce the student to the techniques, materials and equipment used in large format photography. Course emphasis is primarily the control and understanding of the various view camera movements, with application both in the studio and on location. (Prereq: PRPO1010) **(EP) 3 cr**

PRPO1310 PHOTO REPRODUCTION
This course will introduce the student to the theory and the practical applications of black and white high contrast "line" copy, black and white continuous tone copy, color flat art copy, color slide duplication and multi-exposure techniques. Course emphasis is on performance that meets quality reproduction standards using reflective and transmitted lighting techniques. (Prereq: PRPO1030) **(EP) 2 cr**

PRPO1400 DIGITAL DARKROOM
An introduction to the digital darkroom, this class will instruct the student in the use of Adobe Photoshop as it applies to the everyday needs of the photographer working in a digital studio. Students will learn retouching techniques, color correction, compositing and color management as they apply to both portrait and commercial studios. (Prereq: PRPO1010, PRPO1070 and CPLT1200 or instructor approval) **(EP) 3 cr**

PRPO2170 STUDIO MANAGER
This course will introduce the student to management of the studio equipment setup and operation as well as a strong grounding in the practical duties and responsibilities of a professional studio manager/supervisor. Emphasis will be placed on the actual performance of all studio manager/supervisor duties as well as the student's ability to properly interact with peers, assigned studio assistants and the staff supervisor. (Prereq: PRPO1170) **(EP) 2 cr**

PRPO2200 DIGITAL PHOTOGRAPHY
This course will introduce the student to the world of digital photography. Students will deal with various digital capture devices, importing and manipulation in the computer and determining what method of output is best. (Prereq: PRPO1200, PRPO1260 and PRPO1400) **(EP) 3 cr**

PRPO2400 INTERMEDIATE PORTRAITURE
This course is designed to further the students knowledge of portrait photography. The emphasis will be placed on location and environment portraiture as well as a continued refinement of posing and lighting techniques. The course will also cover the basics of the business aspects of portrait photography. (Prereq: PRPO1240) **(EP) 3 cr**

PRPO2410 BUSINESS OF PHOTOGRAPHY
This course is designed to assist the student in the understanding of the business practices of professional photography. Course content includes estimating, pricing, negotiating, copyright and marketing strategies. (Prereq: Minimum of 24 credits earned in the program) **(EP) 2 cr**

PRPO2420 PRODUCT PHOTOGRAPHY
This is an advanced level course designed to provide the student the practical working knowledge needed to produce quality "product" photographs. Solving technical lighting and camera depth of field/distortion problems associated with photographing products is the course primary goal. Course includes a unit on the unique problems associated with shooting food. (Prereq: PRPO1280 or instructor approval) **(EP) 3 cr**

PRPO2430 ADVERTISING PHOTOGRAPHY
This is one of the most advanced level courses offered in the commercial photography program and designed to introduce the student into one of the highest skilled, most demanding and thus one of the highest paid areas of photography. Skill emphasis will be on meeting the criterion of an "Art Director", shooting to ad layout requirements, shooting with models and finally a creative block that demands the students highest level of technical skills, creativity and imagination. (Prereq: PRPO1200 and PRPO1260) **(EP) 3 cr**

PRPO2440 ARCHITECTURAL PHOTOGRAPHY
This is an advanced level course designed to introduce the student to the theory and practical working knowledge associated with the highly skilled and profitable field of architectural photography. Solving technical problems associated with photographing architectural exteriors and interiors while preserving the "art" of the building and its environment are the major goals. (Prereq: PRPO1280) **(EP) 3 cr**

PRPO2450 INDUSTRIAL PHOTOGRAPHY
This is an advanced level course to introduce the student to the "generalist" duties and capabilities of the professional industrial photographer. The unique environment of the "in-house" photographic department requires a full spectrum of photographic shooting, lighting and process skills from the macro-world in engineering photography to portraiture in the executive boardroom and from shooting large factory interiors to creative annual report covers. (Prereq: Minimum of 30 credits earned in the program or instructor approval) **(EP) 3 cr**

PRPO2460 WEDDING PHOTOGRAPHY
This is an advanced level course designed to introduce the student to professional wedding photography. The course covers the basics of the wedding business from sales and promotion to delivery of the wedding albums. Course emphasis is on a "mock" wedding to allow student photographer to practice developing skills in shooting a wedding and producing a quality sample wedding album. (Prereq: Minimum of 30 credits earned in the program or instructor approval) **(EP) 3 cr**

PRPO2510 ADVANCED STUDIO PHOTOGRAPHY
This course is designed to prepare the student for professional competency in the studio using large format and medium format camera, with skills developed for selection and controls of backgrounds and props. The final portion of the course is devoted to the procurement, directing and shooting of models in the studio. Course emphasis is on shooting to assignment criterion that controls lighting, backgrounds and props. (Prereq: PRPO1200 and PRPO1280) **(EP) 3 cr**

PRPO2530 ADVANCED PORTRAITURE
This course is designed to further the student's development of a personal style of portrait photography. Course emphasis will be placed on refining the student's technique in all areas of portraiture, as well as business practices. (Prereq: PRPO2400) **(EP) 3 cr**

PRPO2550 SPECIAL EFFECTS PHOTOGRAPHY
This course is designed to develop and expand the student's capabilities in solving unique photographic problems that cannot be accomplished by "normal" photographic techniques. This course calls for some of the most creative and imaginative aspects of the student's ability and touches on some of the latest technology available in the photographic industry in electronic image manipulation. (Prereq: Minimum of 36 credits earned in the diploma option or instructor approval) **(EP) 3 cr**

PRPO2570 PHOTOGRAPHIC INDEPENDENT STUDY
This is a "student-centered" course designed around meeting the student's specific career exploratory efforts. Emphasis is on the student and the instructor jointly designing a specific course core intended competencies to be accomplished. This course is offered to meet highly unique, research or creative areas of photography not covered in any other program course content. Viable "products" must be accomplished at the conclusion of the course that meet or exceed course objectives. This course may not be audited. (Prereq: Instructor approval) **(EP) 1-3 cr**

PRPO2580 PROFESSIONAL PHOTOGRAPHY INTERNSHIP I
This internship is available to students in either the third or fourth semester status of his/her program. Students may elect to make "internship" a full-time semester but does NOT replace diploma requirements. The course has a variable credit option to permit internship study opportunities from as little as three hours per week to as many as forty hours per week at the internship site. Course emphasis is on selecting an internship site within a very narrow career focus in order to gain maximum exposure to his/her career interest. (Prereq: Minimum of 32 credits earned in the program or instructor approval) **(EP) 2 cr**

PRPO2590 PROFESSIONAL PHOTOGRAPHY INTERNSHIP I
This internship is available to students in either the third or fourth semester status of his/her program. Students may elect to make "internship" a full-time semester but does NOT replace diploma requirements. The course has a variable credit option to permit internship study opportunities from as little as three hours per week to as many as forty hours per week at the internship site. Course emphasis is on selecting an internship site within a very narrow career focus in order to gain maximum exposure to his/her career interest. (Prereq: Minimum of 32 credits earned in the program or instructor approval) **(EP) 1-8 cr**

PRPO2605 OPEN COLOR LAB
This course is designed to allow the student use of the color printing lab to expand the student's color printing skills. The course serves as a creative outlet and permits a great deal of latitude toward self directed study in use of the facilities with emphasis on meeting standards that creatively uses and controls the color printing process. This course may not be audited. (Prereq: PRPO1220) **(EP) 1-2 cr**

PRPO2615 OPEN BLACK AND WHITE LAB
This course is designed to allow the student use of the black and white printing lab to expand the student's black and white printing skills. The course serves as a creative outlet and permits a great deal of latitude toward self directed study in use of the facilities with emphasis on meeting standards that creatively uses and controls the black and white printing process. This course may not be audited. (Prereq: PRPO1030) **(EP) 1-2 cr**

PRPO2625 OPEN STUDIO SHOOTING LAB
This course is designed to allow the student use of the studio facilities to expand the their shooting skills. The course serves as a creative outlet and permits a great deal of latitude toward self directed study in use of the facilities with emphasis on meeting standards that creatively use and control shooting in the studio. This course may not be audited. (Prereq: PRPO2510) **(EP) 1-2 cr**

PRPO2820 COMMERCIAL PORTFOLIO
This is the keystone course of the Commercial Photography diploma option. All other courses in this diploma have been developing competencies to make this course successful. Here the student "puts it all together" to produce a highly effective and professional quality portfolio that helps the student gain employment in their commercial photography career focus. The final portion of the course is devoted to the graduate portfolio exhibits and a comprehensive exam covering the graduate's gained photographic knowledge over the course of the program. (Prereq: A minimum of 40 credits earned in the diploma option or instructor approval) **(EP) 3 cr**

PRPO2840 INDUSTRIAL PORTFOLIO
This is the keystone course of the Industrial Photography diploma option. All other courses in this diploma have been developing competencies to make this course successful. Here the student "puts it all together" to produce a highly effective and professional quality portfolio that helps the student gain employment in their industrial photography career focus. The final portion of the course is devoted to the graduate portfolio exhibits and a comprehensive exam covering the graduate's gained photographic knowledge over the course of the program. (Prereq: A minimum of 40 credits earned in the diploma option or instructor approval) **(EP) 3 cr**

PRPO2860 PORTRAIT/WEDDING PORTFOLIO
This is the keystone course of the Portrait/Wedding Photography diploma option. All other courses in this diploma have been developing competencies to make this course successful. Here the student "puts it all together" to produce a highly effective and professional quality portfolio that helps the student gain employment in their industrial photography career focus. The final portion of the course is devoted to the graduate portfolio exhibits and a comprehensive exam covering the graduate's gained photographic knowledge over the course of the program. (Prereq: A minimum of 40 credits earned in the diploma option or instructor approval) **(EP) 3 cr**

RPMG1105 MARKETING AND LEASING THE MULTI-FAMILY PROPERTY
This course provides an overview of the local, state and federal laws that affect the rental relationship and their consideration in the leasing of rental units. Students will learn effective techniques to rent apartments and plan effective marketing strategies including preparing rental units, doing market research, shopping the competition, analyzing the data and tracking the effectiveness of a marketing program. (Prereq: None) **(EP) 4 cr**

RPMG1205 BUDGETING AND FINANCIAL ADMINISTRATION OF RENTAL PROPERTY
This course will provide the student with the knowledge about the budgeting process, financial administration, and site office organization of a rental community. The objectives of the course include demonstrating budgeting techniques and the day-to-day financial administration of a property. (Prereq: None) **(EP) 4 cr**

RPMG1305 MANAGING THE GROUND AND PHYSICAL PLANT OF RENTAL PROPERTY
This course provides an overview of maintaining the grounds, building and maintenance systems encountered in rental housing. Topics covered in this course include: basic structures of buildings and building systems and establishing a preventative maintenance program. Building systems include heating, air conditioning, electrical, plumbing, drainage, waste and ventilation, energy management, flooring and painting; landscaping and turf maintenance. (Prereq: None) **(EP) 4 cr**

RPMG1405 MANAGING PEOPLE IN THE RENTAL INDUSTRY
This course will look at the importance of employee relations, customer service and resident retention in the rental industry. Students will learn various techniques for selecting, supervising and motivating employees as well as skills for providing quality customer service and practical information on setting up and evaluating a resident retention program. (Prereq: None) **(EP) 4 cr**

RTFL1100 FRESH CUT FLOWER/FOLIAGE CARE, HANDLING AND IDENTIFICATION
This course is designed to introduce the student to fresh cut flower and fresh cut foliage care, handling, identification and their individual characteristics. The student will apply this knowledge to floral materials as purchased from floral wholesalers. This application will prepare the flowers and foliages for use either boxed or arranged. The student will also have an in-depth understanding of how to prolong the life of fresh cut materials in the flower shop as well as in the consumer's home. (Prereq: None) **(BP) 2 cr**

RTFL1111 FOLIAGE AND FLOWERING PLANT CARE, HANDLING AND IDENTIFICATION
This course is designed to introduce the student to foliage and flowering plant care and identification of common plants. The students will apply their knowledge and skills to actual plants and gardens. (Prereq: None) **(BP) 2 cr**

RTFL1200 FRESH FLOWER DESIGN I
This course is prepared to give the student a thorough understanding of basic floral design mechanics, terms and construction techniques. The student will apply their knowledge and skills of fresh floral materials to fresh flower arrangements. (Prereq: RTFL1100) **(BP) 2 cr**

RTFL1210 FRESH FLOWER DESIGN II
This course is prepared to give the student an advanced understanding of fresh floral design forms and styles as well as the opportunity to practice styles already learned. The student will apply their knowledge and skills of fresh floral materials to fresh flower arrangements. (Prereq: RTFL1200) **(BP) 2 cr**

RTFL1220 CONTEMPORARY FRESH FLOWER DESIGN
This course is structured for the experienced designer. Contemporary terms and styles will be discussed, demonstrated and researched. The student will apply their knowledge and skills to fresh flower arrangements. (Prereq: RTFL1210) **(BP) 2 cr**

RTFL1230 SPECIAL OCCASION/PARTY DESIGN
This course is created for the student to become familiar with flowers for special occasions, ceremonies and party work. The student will apply their knowledge and skills to fresh floral arrangements, accessories and party setups.
(Prereq: RTFL1210) **(BP) 2 cr**

RTFL1300 PERMANENT FLOWER AND FOLIAGE DESIGN
This course is prepared to give the student the experience in applying their knowledge and skills of floral design mechanics, elements and principles to permanent floral materials. All elements and principles of design are applied the same as they are with fresh products and are not introduced in this course. The student will learn to apply these skills to arrangements for use in homes, offices and commercial building applications. (Prereq: RTFL1210) **(BP) 2 cr**

RTFL1410 FLOWER SHOP OPERATION
This course is designed to give the student a fundamental understanding of the function and behind the scenes daily operation of a retail flower shop. Included in instruction will be point of sale, cash register and the presentation of products and services. The student will also learn how to wrap merchandise for delivery. This experience is gained with hands-on experience. (Prereq: RTFL1210, RTFL1300 and RTFL1600) **(BP) 2 cr**

RTFL1421 INTERNSHIP
This will be a cooperative training program between Hennepin Technical College and a retail florist which allows the student to apply competencies learned in the program to an employment-like work experience. The student will also experience the daily pressures associated with holidays and other stressful job related activities. Internships are served at retail shops, mass markets and wholesale suppliers.
(Prereq: Instructor approval) **(BP) 3 cr**

RTFL1430 ENTREPRENEURSHIP IN THE FLORAL INDUSTRY
This course will introduce various business aspects of the retail floral business. Guest lecturers and independent research by the student will be used to write a floral shop business plan. The student may also have some limited hands-on experience with business machines, floral software, shop layouts, displays and retail pricing procedures. (Prereq: None) **(BP) 2 cr**

RTFL1500 FUNERAL DESIGN
This course is prepared to give the student a fundamental understanding of basic funeral design, customer needs and funeral home expectations and requirements. The process of selling to a grieving customer will be explored. The students will apply their knowledge and skills to actual funeral style arrangements. (Prereq: RTFL1210) **(BP) 2 cr**

RTFL1510 ADVANCED FUNERAL DESIGN
This course is structured for the experienced designer. Contemporary and advanced terms and styles will be discussed, demonstrated and researched. The students will apply their knowledge and skills to actual funeral style arrangements. (Prereq: RTFL1220 and RTFL1500) **(BP) 1 cr**

RTFL1600 PERSONAL FLOWERS TO WEAR
This course is prepared to give the student a fundamental understanding of styles, mechanics and terms in corsages, boutonnieres and hairpieces. The student will apply their knowledge and skills to actual corsages, boutonnieres and hairpieces. (Prereq: RTFL1100) **(BP) 2 cr**

RTFL1610 WEDDING DESIGN
This course is prepared to give the student a fundamental understanding of wedding flowers, bouquet styles, mechanics and techniques. The process of selling and retail pricing of weddings will be discussed, demonstrated and researched. The students will apply their knowledge and skills to actual floral bouquets and projects. (Prereq: RTFL1600) **(BP) 3 cr**

RTFL1620 ADVANCED WEDDING DESIGN
This course is structured for the experienced designer. Contemporary and advanced styles and trends will be discussed, demonstrated and researched. The students will apply their knowledge and skills to actual floral bouquets and projects. (Prereq: RTFL1220 and RTFL1610) **(BP) 1 cr**

SSCI1000 INTRODUCTION TO ENVIRONMENTAL HEALTH AND SAFETY
The objective of this course is to develop the students ability to minimize health risk by implementing proper routine work practices and by responding to releases of hazardous substances. The individuals actions will result in the protection of human health, property and the environment. This course will provide the student with information required for compliance with hazardous materials handling regulations and successful completion of this course will meet OSHA's general requirements for "First Responder Awareness Level" training. (Prereq: None) **(BP/EP) 1 cr**

Course Descriptions

SSCI1020 CPR/FIRST AID
The student will learn how to: recognize a life threatening emergency; remain calm; how and when to call 911; perform healthcare provider level CPR skills on all age groups including 2 rescuer CPR; assist a conscious or unconscious choking adult, child or infant; use an Automatic External Defibrillator (AED); and barrier devices. Information on Heart Attacks and Stroke recognition is provided. In addition, First Aid skills will cover bleeding control, blood borne pathogens awareness, splinting fractures, treatment of burns and poisonings, injury prevention, medical emergencies and heat/cold emergencies. A (2) year CPR and First-Aid card from MnSCU will be issued. The card will indicate that this course is taught in accordance with the newest guidelines established by the American Heart Association. This course is for healthcare providers and general students. (Prereq: None) **(BP/EP) 1 cr**

SSCI2000 MARRIAGE AND FAMILY
Marriage and Family is the sociological study of the relationships of family life and society in contemporary United States. Analysis will focus on historical perspectives, cross-cultural perspectives, gender roles, gender stratification, sexual roles, cohabitation, and societal norms and expectations. Also, divorce, family violence, remarriages and step-families, parenting roles, and death will be studied. (Prereq: Qualifying score on CPT reading assessment test OR ENGL0920) **(BP/EP) 3 cr**

SSCI2100 INTRODUCTION TO SOCIOLOGY
Sociology is the scientific study of human social activity. In this course, we will emphasize the methods analysis and perspectives of sociology of social relationships. The course will focus on the characteristics of human group life as it relates to the structure of social environment and its influence on the individual. (Prereq: Qualifying score on CPT reading assessment test OR ENGL0920) **(BP/EP) 3 cr**

SSCI2200 PRINCIPLES OF MICROECONOMICS
This course will focus on tools and techniques used by economists that impact decisions made by individuals and businesses/firms. Current microeconomic issues are reviewed and analyzed as well as alternate views being provided. (Prereq: None) **(BP/EP) 3 cr**

SSCI2300 GENERAL PSYCHOLOGY
Psychology is the scientific study of human behavior and mental processes. This introductory course provides a broad overview of topics including: the evolution of psychology, the biological bases of behavior, sensation and perception, consciousness, learning, memory, intelligence, motivation, emotion, human development, personality, research methods, psychological disorders, treatments of psychological disorders, and social psychology. (Prereq: Qualifying score on CPT reading assessment test OR ENGL0920) **(BP/EP) 3 cr**

SSCI2310 PSYCHOLOGY THROUGHOUT THE LIFESPAN
This course explores human development across the lifespan. The developmental process will be viewed from the theoretical, physical, cognitive, and psychosocial perspectives. This course will examine the complete lifespan, beginning with prenatal development and progressing through the process of death and dying. (Prereq: Qualifying score on CPT reading assessment test OR ENGL0920) **(BP/EP) 3 cr**

WLDG1000 CUTTING PROCESSES
In this course students will learn to identify and perform on oxyacetylene, plasma and carbon arc cutting equipment. Students will learn set up, shutdown and performance on various gauges of steel. Students will also learn to identify and perform on the automatic cutter equipment on 20-gauge and 3/8 inch steel. Students will be required to identify shop and personal safety rules to 100% accuracy. (Prereq: None) **(BP) 3 cr**

WLDG1100 OXY-ACETYLENE WELDING, BRAZING AND CUTTING PROCESSES
Using the oxy-acetylene process, this course will teach the student to fusion weld carbon steel in all positions. Braze weld carbon steel and cast iron, and oxy-acetylene cutting of carbon steel are also included. (Prereq: None) **(BP) 3 cr**

WLDG1135 GAS METAL ARC WELDING I
This course teaches students identification and MIG welding equipment, joint design, welding terms and safety procedures. Students will learn set up, operation and perform bead, single and multiple pass butt and tee, lap and outside corner welds in the flat, horizontal positions. Students will also identify and describe personal shop and other related safety rules. The students will be required to identify shop and personal safety rules to 100% accuracy. This course will also require identification and performance of wire type and diameter and equipment on 3/16 inch and thicker plate steel. (Prereq: None) **(BP) 3 cr**

WLDG1140 GAS METAL ARC WELDING II
This course will prepare students to wirefeed weld stainless and aluminum in all positions using solid wire with various shielding gasses including short circuit metal transfer, spray transfer and pulse metal transfer processes. (Prereq: WLDG1135 or instructor approval) **(BP) 3 cr**

WLDG1165 GAS METAL ARC WELDING III
To develop and refine welding skills in the horizontal, vertical and overhead positions to prepare for welder qualification test. (Prereq: WLDG1140) **(BP) 3 cr**

WLDG1175 GMAW FABRICATION METHODS
In this course you will learn to combine your GMAW skills with fabrication procedures to fabricate or repair various types of weldments using proper layout procedures. (Prereq: WLDG1140 or instructor approval) **(BP) 3 cr**

WLDG1181 BLUEPRINT READING FOR WELDERS
This course will teach the student print layout, identification of views, welding symbols, retrieving information from print, figure parts and material list, and fabricating weldment from print. (Prereq: None) **(BP) 3 cr**

WLDG1220 GAS TUNGSTEN ARC WELDING I
This course covers welding various joints on carbon steel, stainless steel and aluminum using the gas tungsten arc (TIG) welding process. The use of various machines, gasses and consumables are emphasized. (Prereq: None) **(BP) 3 cr**

WLDG1225 GAS TUNGSTEN ARC WELDING II
The development of welding skills in vertical and overhead positions will be stressed. Materials for welding are aluminum, stainless steel, and carbon steel. (Prereq: WLDG1220 or instructor approval) **(BP) 3 cr**

WLDG1235 GAS TUNGSTEN ARC WELDING III
To further develop and refine welding skills in the horizontal, vertical and overhead positions to prepare for welder qualification test. (Prereq: WLDG1225) **(BP) 3 cr**

WLDG1245 GTAW FABRICATION METHODS
In this course you will learn to combine your GTAW skills with fabrication procedures to fabricate or repair various types of weldments using proper layout procedures. (Prereq: WLDG1181 and WLDG1225 or instructor approval) **(BP) 3 cr**

WLDG1310 SHIELDED METAL ARC WELDING I
This course covers shielded metal arc welding (STICK) safety and basic SMAW procedures in the flat, horizontal, vertical, and overhead position. The student will weld various joints using carbon steel plate and mild steel electrodes, and E7018 electrodes. The student will also be introduced to the oxy-fuel machine cutting. (Prereq: None) **(BP) 3 cr**

WLDG1320 SHIELDED METAL ARC WELDING II
To develop proficient skills and knowledge of SMAW in the horizontal, vertical and overhear positions.
(Prereq: WLDG1310) **(BP) 3 cr**

WLDG1330 SHIELDED METAL ARC WELDING III
To develop and refine welding skills in the horizontal, vertical and overhead positions to prepare for welder qualification test. (Prereq: WLDG1320) **(BP) 3 cr**

WLDG1340 STRUCTURAL IRON FABRICATION METHODS
In this course you will learn to combine your skills with fabrication procedures to fabricate or repair various types of weldments using proper layout procedures. (Prereq: WLDG1181 and WLDG1320 or instructor approval) **(BP) 3 cr**

WLDG1350 FLUX CORED ARC WELDING I
This course covers wirefeed welding of carbon steel in all positions. The student will use gas shielded flux-cored, self-shielded, and metal cored, wire with carbon dioxide and argon/carbon dioxide gasses. (Prereq: None) **(BP) 3 cr**

WLDG1360 FLUX CORED ARC WELDING II
To develop and refine welding skills in the vertical and overhead positions to prepare for welder qualification test. (Prereq: WLDG1350) **(BP) 3 cr**

WLDG2160 SELECT METALS BASED ON WELDABILITY
This course is designed to introduce the student to the correct process, base metal, filler metal, heat treatment and welding techniques required to obtain welds of desirable mechanical, physical and chemical quality for the particular type of weldment. Often times in industry, these choices may be left up to the welder or welding supervisor. (Prereq: Instructor approval) **(BP) 3 cr**

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John and Sally Turrittin Donate $5,000 For Landscape Student Scholarships

"I feel very positive about the mission of the college and our program's place in the landscape industry." That's what HTC Instructor John Turrittin, a veteran of 23 years of teaching at HTC, had to say about the reason he and his wife, Sally, decided to donate $5,000 as a scholarship fund for Landscape students. "The diverse interests and personalities of my students have always been a highlight of my job," Turrittin continued. "I admire the commitment it takes to be a successful student at HTC, and a significant part of this is their financial commitment. This scholarship will help offer financial options for students in the future."

Last year the Turrittins' 22-year old son, Jeffrey, became very ill and was not expected to live more than a couple of months. Today he has recovered and returned to college, for which the family is very grateful. "Something like that gives you a different perspective on life and what you'd like to accomplish," explained Turrittin, who said his family also made a donation to his son's school.

"John is the first HTC instructor to make a single donation of this size," said Carole Carlson, Executive Director of Institutional Advancement. "We appreciate this gift and the message it sends about the confidence John and Sally have in the college and its mission." The first scholarship to an HTC Landscape student will be awarded for use next fall. Each scholarship is expected to be for $750.

HTC President Sharon Grossbach, (left), accepts a donation from HTC instructor John Turrittin and his wife Sally.

Summing up his feelings about the donation, Turrittin added, "I hope that perhaps this will be a bit of a seed for thought for other instructors to honor this institution and our students."

For Power Equipment Training, HTC Is The Place To Go In The Metro

HTC Power Equipment Training instructors Dan Weishaar and Tom Scholberg.

Convenient locations and course selections are often given as reasons why students choose HTC. This is especially true of students enrolled in the Marine/Motor Sports Technology Program at Eden Prairie Campus. Now, in addition to offering classes covering maintenance and repair of outboard motors, motor-cycles, and snowmobiles, the program includes power equipment, such as lawn and garden equipment. Instructor Tom Scholberg said there are 48 students currently enrolled in the program. What makes this special? "There is no other Power Equipment program in the metro area," explained Scholberg. HTC offers a two-year diploma, as well as a one-year certificate. Plans are in the works for the addition of an A.A.S. degree in the future. Job prospects are strong for graduates, noted Scholberg, because the industry is facing what it describes as a critical shortage of workers.

The training includes classroom time and hands-on work on actual equipment. While there are no classes held in the summer, Scholberg observed that the students generally find jobs that serve as unofficial internships. Once employers see them put their skills to work, the students are usually offered permanent employment when they complete their training.

Those currently enrolled in the program at HTC include a high percentage of displaced workers, many who are former employees of Northwest Airlines. However, there are also recent high school graduates seeking first career training, as well as students in their fifties or sixties.

With the only Power Equipment training program in the metro area, HTC shows again that the college makes lifelong learning a priority in serving the community.

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