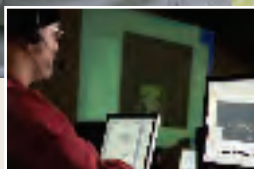# Hennepin Technical College
Catalog 2006/2007

Business and Information Technology
- Accounting Careers
- Business
- Information Technology/ Computer Careers
- Medical Office Careers
- Residential Property Management
- Web Programmer

Construction and Building Careers
- Architectural Drafting
- Cabinetmaking
- Carpentry
- Heating, Ventilation, Air Conditioning and Refrigeration

Floral, Landscape and Horticulture Careers
- Landscape Careers
- Floral (Retail)

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

HennepinTechnical
College

www.HennepinTech.edu

Additional programs listed on the back cover

Phone Numbers

Student Services Automated System . . . . (763) 488-2500

Toll free 1 (800) 345-4655

TTY . . . . (763) 488-2571

	BROOKLYN PARK	**EDEN PRAIRIE**
Admissions Testing	(763) 488-2498	(952) 995-1453
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	(763) 488-2491	(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	Kim Chau Ngo . . . . (763) 488-2425	Tadael Emiru (952) 995-1440

ADDITIONAL SITES

Bloomington Workforce Center . . . . (952) 346-4000

Customized Training Services . . . . (763) 550-7159

Phone numbers subject to change.

www.HennepinTech.edu

HennepinTechnical
College

Welcome
to Hennepin Technical College

Greeting from the College President

On behalf of the faculty, staff and administrators of Hennepin Technical College and the Minnesota State Colleges and Universities, I proudly and enthusiastically welcome you to explore and learn about HTC, its educational programs, support services, and the dedicated people who make HTC such a special and inviting place. By choosing HTC, the largest stand-alone technical college in Minnesota, you become part of a network of people who are excited about contributing to this dynamic teaching and learning community. With campuses in Brooklyn Park and Eden Prairie and a Customized Training Center in Plymouth, HTC is accessible and affordable.

Please take your time as you search through the student handbook, college catalog, course schedule, and website. I'm certain you will find the answers to many of your questions about the rewarding training opportunities we have to offer.

HTC faculty members are among the top in their respective fields of expertise with most of them having recently worked directly in their area of specialization. With a strong commitment to excellence, they bring that expertise to you in the form of quality instruction, hands-on training, and practical, as well as, theoretical knowledge.

HTC staff offer students special attention through a range of academic and student support services that include counseling, student advising, financial aid, tutoring, job placement, assistance for students with disabilities, and much, much more.

At HTC, our mission is to provide the *quality technical education needed for employment in an ever-changing global work environment.* Come partner with us and discover the HTC difference!

Most sincerely,

Kathryn E. Jeffery, Ph.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.

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.
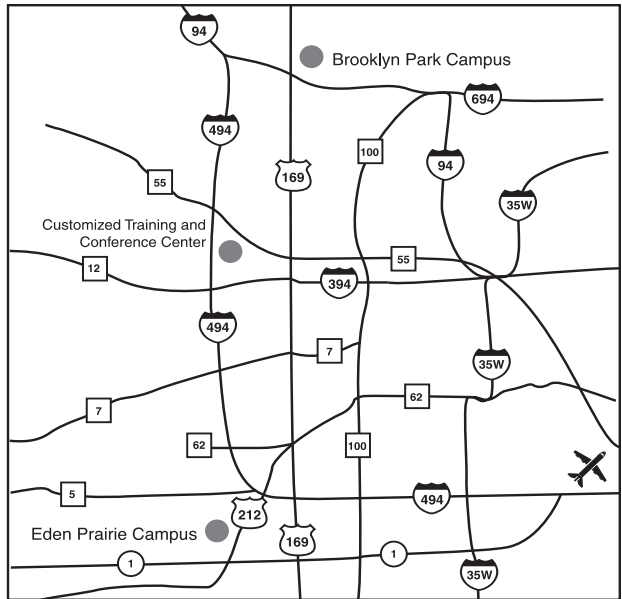
Customized Training & Conference Center

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.

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 in accordance with current conditions. Information presented in this publication should not be considered as an irrevocable contract.

2006-07 Academic Calendar

Fall Semester 2006   **August 21 - December 22**

Fall Tuition Due. . . . . July 27
Fall Semester Begins. . . . . August 21
Last day for 5-day add/drop period. . . . . August 25
Labor Day Holiday (College Closed) . . . . September 4
Priority registration applications for spring graduates due to Registrar . . . . September 22
Workshop Days (No Classes) . . . . September 25-26
Spring Advising Week . . . . October 9-13
Education MN Days (No Classes) . . . . October 18-22
Priority Registration for Spring Begins. . . . . October 30
Open Registration for Spring Begins . . . . November 7
Thanksgiving Holiday Break (No Classes). . . . . November 22-26
Last day to drop a fall semester course and receive a "W" . . . . December 8
Fall Semester Ends . . . . December 22
Semester Break (No Classes) . . . . December 23-January 15

Spring Semester 2007   **January 16 - May 19**

Spring Tuition Due . . . . December 21
Martin Luther King Jr. Holiday (College Closed). . . . . January 15
Spring Semester Begins. . . . . January 16
Last day for 5-day add/drop period. . . . . January 22
Presidents' Day Holiday (College Closed) . . . . February 19
Workshop Day (No Classes) . . . . February 20
Workshop Day (No Classes). . . . . March 2
No Classes . . . . March 3-4
Spring Break (No Classes). . . . . March 19-25
Summer/Fall Advising Week. . . . . April 2-6
Priority Registration for Summer/Fall Begins . . . . April 16
Open Registration for Summer/Fall Begins . . . . April 24
Last day to drop a spring semester course and receive a "W". . . . . May 4
Spring Semester Ends . . . . May 19
Semester Break (No Classes). . . . . May 20-28

Summer Semester 2007   **May 29 - August 17**

Summer Semester Tuition Due. . . . . May 11
Memorial Day Holiday (College Closed) . . . . May 28
Summer Semester Begins. . . . . May 29
Independence Day Holiday (College Closed). . . . . July 4
Summer Semester Ends . . . . August 17

The dates listed above may change. Contact the college for up-to-date information.
Refer to the Hennepin Technical College website for registration dates.

Programs

Business & Information Technology
Accounting Careers

Business

Information Technology/
Computer Careers

Medical Office Careers

Residential Property Management

Web Programmer

Construction and Building Careers
Architectural Drafting

Cabinetmaking

Carpentry

Heating, Ventilation, Air Conditioning
and Refrigeration

Floral, Landscape and Horticulture Careers
Landscape Careers

Floral (Retail)

Health Careers
Dental Assistant

Emergency Medical Services

Health Unit Coordinator

Nursing Assistant

Practical Nursing

Manufacturing and Engineering Technology
Automated Machinery Systems:
Packaging

Electronics Technology

Engineering CAD Technology

Fluid Power Engineering Technology

Industrial Building Engineering
and Maintenance

Machine Tool Technology

Manufacturing Engineering Technology

Plastics Manufacturing Technology

Welding and Metal Fabrication

Media Communication Careers
Audio Production

Graphic Design

MultiMedia/Video Design
and Production

Printing and Prepress Technology

Professional Photography

Public Safety and 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

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
Hennepin Technical College (HTC) 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 which lead to A.S. degrees, 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, which support communication, shared decision making, and quality programs and services.

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

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) of the North Central Association of Colleges and Schools. HLC's website is www.ncahigherlearningcommission.org. HLC may be reached at 1-800-621-7440, x100.

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.

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.

General Information continued

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, the Rehabilitation Act, and the Minnesota Human Rights Act, which provide for reasonable accommodations for students with documented disabilities. Persons needing accommodations should contact the Disability Services Coordinator on either campus.

Sara Laviolette, Disability Services Coordinator at Brooklyn Park Campus, (763) 488-2477

John Heinrichs, Disability Services Coordinator at Eden Prairie Campus, (952) 995-1544

TTY, (763) 488-2571

Upon request, this information will be made available in an alternate format by contacting Disability Services.

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 strives to educate students and employees of health risks associated with drug and alcohol use.

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
- View your DARS audit

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.
- Request high school and college transcripts be sent to the HTC Admissions Office.

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. A HTC counselor advises students if they will be required to take prerequisite developmental courses in math, writing, reading, or courses for English Language Learners (ELL). 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.

Admissions **continued**

Lack of English skills will not be a barrier to admission to HTC. In order to eliminate barriers, appropriate measures are taken to assess each student's readiness to participate and benefit through the above process. Based on assessment and counseling, students are provided with campus services or referral to community service that better prepare them for successful post-secondary education.

Non-US Citizen and Documentation Needed

Hennepin Technical College has an open-door admissions policy. Applicants who have resided in Minnesota for at least one calendar year qualify for resident tuition. Applicants who are not U.S. citizens will be asked to provide additional documentation to prove that they are either permanent residents, refugees, or asylees in order to qualify for resident (in-state) tuition.

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 purchase health insurance through MnSCU prior to registering for courses at HTC. International students are responsible for maintaining their legal status while enrolled at HTC. It is against the law for F-1 visa holders to work at a job without prior authorization from the Department of Homeland Security.

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 a 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 a 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 a 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.S. degree, 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.

Admissions **continued**

Associate in Science (A.S.) Degree

A.S. degrees prepare students to transfer to a baccalaureate program in a related scientific, technical, or non-liberal arts professional field. An A.S. degree may also be designed to prepare students for employment. General education courses are selected from at least six of the ten goal areas of the Minnesota Transfer Curriculum. A.S. degrees have a credit range of 60-64 credits. Hennepin Technical College offers Associate in Science degrees in selected majors. A.S. degrees are awarded to students upon satisfactory completion of all degree requirements.

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

A.A.S. degrees prepare students for 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 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 positions that require less than one year of education. Certificates have a credit range from 10-30 credits.

2+2 Articulated Opportunities Available

Hennepin Technical College has articulation agreements with several universities for transfer of A.S. degrees and A.A.S. degrees toward Bachelor degrees. The number of credits that may be transferred is determined by the receiving institution. Students interested in this option may contact a HTC counselor or access the information from the HTC website.

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. Any college level course can be considered for transfer toward General Education and/or Technical Studies Electives. Technical courses more than 5 years old are not eligible for transfer. 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 the Transfer Advisor regarding specific program transfer requirements.)

Students pursuing an A.S. degree, 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., A.A.S., or have completed the Minnesota General Education Transfer Curriculum (MnTC) 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.

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

Transfer of Credit continued

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.

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.

If a student's cumulative GPA at the 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.S. degree, 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.

The MnTC Goal Areas are as follows.

- **MnTC Goal 1: Communications**
  COMM2050 Interpersonal Communications
  COMM2060 Small Group Communications
  COMM2130 Public Speaking
  ENGL2121 Writing and Research
  ENGL2125 Technical Writing
  ENGL2130 Creative Writing

- **MnTC Goal 2: Critical Thinking**
  COMM2060 Small Group Communications
  PHIL2100 Critical Thinking

- **MnTC Goal 3: Natural Sciences**

- **MnTC Goal 4: Mathematical/Logical Reasoning**
  MATH2100 Concepts in Mathematics
  MATH2150 Introduction to Statistics
  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: Ethical and Civic Responsibility**
    - PHIL2200 Ethics
    - PHIL2300 Business Ethics
    - PHIL2400 Medical Ethics

- ■ **MnTC Goal 10: People and the Environment**

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.

Veteran's Military Training

College credit for prior military training and experience may be awarded. The standards of the American Council on Education or equivalent standards for awarding credit and the current Hennepin Technical College transfer policy will be used to determine course transfer.

High School Articulation

Students who enroll at Hennepin Technical College may request to have Minnesota High School Tech Prep College Credits, which apply to their major, entered on their HTC college transcript. The students have up to five years from the date the Minnesota High School Tech Prep College Credit course(s) was completed, with a grade of "B" or better, to formally request college credit for the articulated course(s). Refer to the HTC website for the complete procedure for "Transfer of Minnesota High School Tech Prep College Credits to Hennepin Technical College."

Residency Credits

To be eligible for an A.S. degree, A.A.S. degree, diploma, or certificate, a student must earn one-third of the credit require-ments 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. **Veteran's Military Training:** College credit for prior military training and experience may be awarded.

The standards of the American Council on Education or equivalent standards for awarding credit and the current Hennepin Technical College transfer policy will be used to determine course transfer.

5. **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-time and part-time students. Students must declare a major in a program that is at least 16 credits in length, leading to an A.S. degree, 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 010491. 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. Any institutional charges will be deducted from the grants and loans and the balance will be paid to the student.

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 website.

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-quarter 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.

Financing continued

Veterans Affairs

The Veterans Administration Form 22-1990, which is the Application for VA Educational Benefits, should be filled out by a veteran immediately after being accepted at HTC. The 22-1990 can be completed by contacting your local veterans' service office or the Financial Aid Office.

Once you are attending classes, any change in address, marital status, dependency, declared major change, etc., should be reported to the Financial Aid Office. It is also your responsibility to bring a copy of your DD-214 to HTC for your VA file.

For more information or assistance, contact the Financial Aid Office at Brooklyn Park Campus at (763) 488-2491 or the Eden Prairie Campus at (952) 995-1471.

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 are 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 Fees

The college establishes a tuition payment deadline for each semester. Students who do not pay their tuition and fees by the tuition payment deadline may have their course registration canceled 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 (FACTS e-cashier) and paid the required down payment
- The college received advance payment of a scholarship sufficient to cover your tuition and fees.

Students who add courses after the payment deadline must pay their tuition by the Friday of the week they register. After the fifth day of the semester, tuition is due the day you register.

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. This fee is assessed only one time at HTC and needs to be paid before your application can be processed.

Tuition Rates

Hennepin Technical College is a member institution of the Minnesota State College and Universities (MnSCU) System. The State of Minnesota pays approximately $4,028 of the average cost for full-time students. Tuition revenue pays for approximately 49.6% of the cost of a student at a public college or university. 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 including online courses have approved differential rates. Courses with differential rates are identified in the online 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 $0.31 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.

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.

Test Out

The fee for testing out of a course is based on the lecture/lab breakdown of the course; $25 per lecture credit and $50 per lab credit.

Portfolio Evaluation

The fee for Portfolio Evaluation is based on the lecture/lab breakdown of the course; $25 per lecture credit and $50 per lab credit.

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.

Tuition and Fees cont.

Methods of Payment

There are three methods of payment at Hennepin Technical College:

1. You may pay online. The college accepts VISA, MasterCard, and e-checks from checking or savings accounts. 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 using cash, check, or VISA, MasterCard, or Discover credit cards. You may 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

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 on the HTC online course schedule. 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.S. degree, 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 a 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 for a minimal fee. The Senior rate fee will apply to courses taken for credit. There is no fee for auditing courses. Seniors must pay for books, supplies, fees, and materials. Senior rate registrations will be accepted on a space available basis the day after the first class meets. 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. Adding courses may not be done online after the fifth day 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.

- 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 not be allowed after 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 and may require the student to repay a portion of that 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:

Fall and Spring Semester

- 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

Summer Term

- 1st through 5th day of summer term . . . . 100% Refund

- 6th through 10th day of the term . . . . 50% Refund

- After the 10th day of the term . . . . 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 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 term because of the shorter timeframe.

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. If a student withdraws before his/her financial aid is disbursed, the student is responsible for the tuition due to the College. Failure to attend class does not qualify as a withdrawal from the college.

Last Day of Attendance/Return of Title IV Funds (Financial Aid Recipients)

If a student receives all Fs for a semester, the financial aid office is required to determine the last date of attendance. The amount of aid earned is determined by the last date of attendance and any unearned aid will be returned to the financial aid programs. The student may need to repay a portion of financial aid he/she received.

Course Information

Technical Courses

Technical courses lead toward an A.S. degree, 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 the HTC catalog.

Required Courses

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

Elective Courses

Courses listed as electives in an A.S. degree, 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.S. degree, 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 Information
continued

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.S. degree, A.A.S. degree, diploma, or certificate.

Course Prerequisites

Course prerequisites are listed in the course description section of the catalog and on the HTC website. Students are responsible for meeting course prerequisites or obtaining waiver authorization from program faculty or a counselor.

A course taken for audit will not satisfy a prerequisite.

Course Schedules

The course schedule on the HTC website contains the most accurate and up-to-date information.

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)

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 calculation does not include test-out grades, transfer grades, advanced placement, portfolio, 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 grade points ÷ 12 credits total = **2.25 GPA**

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 21 credits. Students may 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.S. degree, A.A.S. degree, diploma, or certificate.

Requirements

In order for students to graduate from an A.S. degree, 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.S. degree, A.A.S. degree, diploma, or certificate program. Students who have completed program requirements and filed an Intent to Graduate form are encouraged to participate. Students who fail to submit an Intent to Graduate form by the published deadline may not be considered for that term's graduation event.

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) provides a supportive learning environment in which students can receive free individual tutoring, group tutoring, or participate in guided study groups. The LRC is available to all students at Hennepin Technical College.

Services include:

Individual or group tutoring in:

- math
- reading
- writing
- technical coursework
- English proficiency
- study skills
- organizational skills
- test preparation

Guided study groups

Specialized learning software

Contact the Learning Resource Center for more information.

Brooklyn Park Campus (763) 488-2451
Eden Prairie Campus   (952) 995-1548
TTY   (763) 488-2571

Student Advising

Faculty advisors 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.

Student Support Services continued

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. Students must initiate a request and be approved for accommodations by a Disability Services Coordinator.

Services may include:

- Disability-related career and program information, advising, and support.
- Classroom and laboratory accommodations in accordance with relevant legislation, for example, extended test time, test reading, note-taking, and/or alternate text format.
- Advocacy in arranging accommodations or in mediating grievances.
- Transitional services for students entering college or entering the workforce.
- 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.

Contact Disability Services for assistance:

Sara Laviolette, Disability Services Coordinator at Brooklyn Park Campus, (763) 488-2477

John Heinrichs, Disability Services Coordinator at Eden Prairie Campus, (952) 995-1544

TTY, (763) 488-2571

Multicultural/International Student Advisor

The Multicultural/International Student Advisors support the College's commitment to students by:

- Promoting understanding of cultural and ethnic heritages at the college
- Supporting enrollment and retention of culturally diverse students
- Enhancing curriculum development through the inclusion of multicultural perspectives
- Providing resources for intercultural campus and community initiatives
- Providing assistance to international students and helping them accomplish their education and career goals

Services available for students include:

- Academic and personal advising
- Providing financial aid and scholarship information
- Immigration and visa regulation advising to international students
- Referrals to career services, community agencies, housing, and various other student support services
- Encouraging involvement with cultural and social activities
- Encouraging membership in student organizations

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 Connection 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) for Technical Studies

English Language Learners (ELL) are an important part of the HTC college community. HTC's goal is to help 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 take these courses will first take a placement test. Then they will meet with a counselor about which class(es) would help them the most.

English as a Second Language (ESL) courses support the learning of ELL students on campus. The courses develop a student's basic level of reading, writing, listening, speaking, and grammar skills.

The goal of ESL is to prepare ELL students for enrollment in career programs. 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 courses will be offered for students with manufacturing or nursing majors. ESL courses are for ELL students with an intermediate-level of English or higher.

Retention Liaisons

The Retention Liaisons offer assistance to ELL students with services such as financial aid, admissions, program placement, tutoring, career counseling and job placement procedures. They can also help in locating services for social and academic support. To contact the Retention Liaison at Brooklyn Park Campus call (763) 488-2577 or Eden Prairie Campus at (952) 995-1429.

Student Rights and Responsibilities

Student Attendance

Students are required to attend the first meeting of every class in which they are enrolled. Failure to do so may adversely affect their ability to successfully complete the class. Instructors are not required to re-teach missed coursework caused by student absence.

Satisfactory Academic Progress Policy

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 (S.A.P.) 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. A suspension notation will be placed on the student transcript and removed upon graduation.

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.

Student Rights and Responsibilities **continued**

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

All forgiven credits and grades will be calculated into the student's cumulative grade point average, completion rate and maximum time frame.

Audited Courses

Audited courses will not be funded by financial aid and are not included in any satisfactory academic progress measurements.

Consortium Credits

Credits for which financial aid is received under a consortium agreement will be included in cumulative GPA, completion percentage, and maximum time frame calculations.

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

Part 1. Statement of Purpose

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.

The college has a responsibility to its students and staff to maintain an environment conductive to furthering its educational mission and to take corrective action when necessary. This code of student conduct incorporates 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 complete document shall be available in the Admissions Office. The college may revise the code as needed.

Part 2. Definitions

A. The term college property includes all land, buildings, facilities, and other property, real and personal, possessed, owned, leased, used, or controlled by the college, including adjacent streets and sidewalks.

B. The term faculty member means any person hired by the college to conduct classroom activities.

C. The term member of the college community includes any person who is a student, faculty member, administrator, or any other person employed by the college.

D. The term student includes all persons taking courses at the college, both full-time and part-time. A person who is not officially enrolled for a particular term but who has a continuing relationship with the college is considered a student. A person who was enrolled during a spring term and is expected to enroll for the subsequent fall term is a student during the interim.

E. The term student conduct panel means a panel appointed to provide formal review and decision in student conduct hearings.

Part 3. College Jurisdiction

College jurisdiction is asserted for violations of the code of student conduct that occur on college property. College jurisdiction shall also extend to violations of the code that are not committed on college property when:

A. The violation is committed while participating in a college sanctioned or sponsored activity; or

B. The victim of the violation is a member of the college community; or

C. The violation is a felony under federal or state law; or

D. The violation adversely affects the educational, research, or service functions of the college.

Part 4. Student Conduct - Behavioral Proscriptions

A. All students have the responsibility to:

1. comply with all local, state, and federal laws.

2. comply with all published college and Board of Trustees rules, regulations, policies, and procedures.

3. recognize and respect the rights of others.

4. assist the college staff with maintaining a safe college environment.

5. respect and maintain college property.

Student Rights and Responsibilities continued

6. dress in a manner that meets standards of safety and health and is appropriate for the occupation for which the student is preparing.

7. provide complete and accurate information relative to college matters.

B. Examples of conduct that violate the code of student conduct and are subject to disciplinary sanctions by the college include, but are not limited to:

1. violation of local, state, or federal laws.

2. violation of published policies, rules, procedures, or regulations of the Board of Trustees or of the college.

3. acts of dishonesty, including but not limited to cheating and plagiarism and forging, altering, or misusing college documents or records.

4. knowingly furnishing false information, oral or written, to the college.

5. failure to comply with directions of, or to present identification to college officials acting in the performance of their duties.

6. failure to comply with conditions of sanctions imposed by the college as a result of previous conduct code action.

7. possession of firearms or other weapons or devices while on college property or at college sponsored or supervised activities, except possession specifically authorized by the college. Firearms and other weapons or devices include but are not limited to: pistols; rifles; air guns; shotguns; ammunition; incendiary devices; smoke devices; knives; explosives; bows and arrows; or chemical agents.

Refer to the HTC website for the Possession or Carry of Firearm and Other Weapons Policy (HTC Policy 04.09).

8. use, possession or distribution of alcoholic beverages, narcotics, or other controlled substances on college property or at college sponsored or supervised activities except as expressly permitted by law.

9. attending college classes or activities while under the influence of alcohol, narcotics, or other controlled substances.

10. violating tobacco use policy. Refer to the HTC website for the Tobacco Use Policy (HTC Policy 03.02).

11. physical or psychological abuse or harassment of a person, including stalking; abuse or harassment through other persons, or by use of electronic or other communication devices such as audio/video recorders, computers, and telephones.

12. physical abuse, verbal abuse, threats, intimidation, coercion, or other conduct which endangers or threatens to endanger the health or safety of any person.

13. conduct which results in injury or death to a member of the college community, or to a visitor to the college.

14. engaging in fighting; engaging in assault or battery upon a member of the college community or a visitor to the college; engaging in obscene, abusive, lewd or profane language; engaging in boisterous or noisy conduct reasonably intend to arouse alarm, resentment or anger in others; disrupting classes, meetings, or other college activities.

15. unauthorized entry into college property.

16. theft of, damage to, or unauthorized use of college property or the property of any member of the college community or of a visitor to the college. This includes improper use of college computers, software, or other technology.

17. hazing - an act which endangers the mental or physical health or safety of a student, or which destroys or removes public or private property, for the purpose of initiation, admission into affiliation with, or as a condition for continued membership in a group or organization.

C. A person who incites or assists others to engage in conduct that violates the student conduct code shall be considered and treated the same as the person carrying out such action.

D. Allegations of discrimination, harassment, violence, or academic dishonesty shall be adjudicated under separate procedures in accordance with the college's policies on these issues, but violators shall be subject to the sanctions described in the code of student conduct.

E. Academic discipline shall be conducted under a separate college policy. The procedures described in this code of student conduct shall not apply to academic discipline.

Part 5. Charges and Informal Meeting

Any member of the college community may file a charge against a student for violating the code of student conduct. Charges shall be prepared in writing and shall be filed with the Chief Student Affairs Officer (CSAO). A charge shall be submitted as soon as possible after the conduct takes place, preferably within three days.

The CSAO shall conduct a preliminary investigation of the charge. If the charge is unwarranted, the CSAO may discontinue proceedings.

Upon determination that there may be merit to the charge, the CSAO shall:

A. provide written notice to the accused student that a charge has been filed alleging that the student has violated the code of student conduct. This notice shall state the specific violation(s) alleged and the dates the alleged violation(s) occurred.

B. provide the student with a copy of the code of student conduct.

C. inform the student of the nature of the evidence available to support the charge.

D. allow the student not less than 48 hours to prepare for the meeting, specify a date and time when the student is required to meet with the CSAO or dean to attempt an informal resolution of the charge.

E. inform the student that failure to appear for the informal meeting shall result in the charge being considered with the information available. Appropriate sanctions, if any, shall then be determined by the CSAO.

If a mutually acceptable resolution cannot be reached during the informal meeting, including any applicable sanctions, the CSAO shall refer the charge to the student conduct panel for formal adjudication.

The student conduct code in its complete form may be obtained from the Registrar's Office. Those sections that are not included in this publication which are included in the complete code include:

- Formal hearing process
- Appeals process
- Sanctions
- Summary suspension process

Student Rights and Responsibilities continued

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.

Complaints

A complaint is an informal claim alleging improper, unfair, or arbitrary treatment. Disagreement with an administrative decision or the outcome of an appeal of that decision is not a complaint unless it alleges improper, unfair, or arbitrary treatment.

To Make/Resolve a Complaint

Note: Complaint processes are subject to the time limits as listed within this policy.

1. To resolve a complaint, the student should first contact the employee with whom the complaint exists.

2. Although it is not required that the complaint be written, the student is encouraged to write down: a) the reason for the complaint, b) factual summary of the complaint, and c) the remedy sought before arranging a meeting with the appropriate individual to discuss the complaint.

3. If there is no agreement or resolution during the initial complaint process, the student may schedule a time to discuss the complaint with the employee's direct supervisor.

4. The direct supervisor will review previous resolution steps, discuss the complaint with the student and other appropriate individuals, and communicate an answer to the student.

5. If there is no agreement or resolution during the meeting with the direct supervisor, the student may seek resolution using the grievance process.

Grievances

A grievance is a written formal claim alleging improper, unfair or arbitrary action that violates a specific policy, procedure, or practice of Hennepin Technical College or the MnSCU System. Disagreement with an administrative decision or the outcome of an appeal of that decision is not a grievance unless it alleges improper, unfair, or arbitrary action.

To File/Resolve a Grievance

Note: Grievance processes are subject to the time limits as listed within this policy.

1. If a complaint is not satisfactorily resolved during the complaint process, and/or if the complaint addresses a violation of a specific policy, procedure, or practice of Hennepin Technical College or the MnSCU System, the student may file a written grievance through four (4) steps if necessary:

   a. To the employee being grieved.

   b. To the administrator to whom the employee reports; and

   c. If the grievance involves a college policy or practice, to the college president. The decision of the president is final and binding.

   d. If the grievance involves a board policy or the actions of the college president, a student may further appeal the college decision through the chancellor to the board. The decision of the board is final and binding.

2. Employees identified in the grievance shall receive copies of the grievance and any supporting documentation. Employees may submit a written response to the grievance.

3. The appropriate administrator will review the material submitted by the student to see if the material constitutes a grievance. If the material does not constitute a grievance, the administrator will communicate to the student and the involved employee.

4. If the material does constitute a grievance, the administrator shall conduct a thorough review and provide a written statement of finding to the student and the involved employee.

5. If the grievance process does not resolve the grievance, the student may consider filing an appeal through the college appeal process.

Time Limits for Complaints and Grievances

■ The initial complaint or grievance must be presented within twenty (20) business days after the first occurrence of the event giving rise to the complaint or grievance, or twenty (20) business days after the student, through use of reasonable diligence, should have obtained knowledge of the first occurrence of the event giving rise to the complaint or grievance.

■ All subsequent time limits (written response, appeal, final resolution, etc.) are limited to ten (10) business days.

■ By mutual agreement of the student and college personnel, time limits may be extended due to extenuating circumstances approved by the appropriate dean or vice president.

■ If a complaint or grievance is not presented within the established limits, it shall not be considered.

■ If a complaint or grievance is not appealed to the next step within the established time limits, it shall be considered settled on the basis of the last answer.

■ If, after presentation at any step, a college staff member does not discuss and/or answer the complaint or grievance with the student within the established time limits, the student may treat the complaint or grievance as denied at that step and may appeal the complaint or grievance to the next step.

Student Appeals Procedure

Student Responsibility

Students are responsible for knowledge of and compliance with Hennepin Technical College policies, procedures, and regulations. Policies and procedures affecting students are stated in this document. 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.

Process

The student must make the appeals request in writing on the standard appeals form. The student must provide reasons and supportive documentation for the appeals request. The appeals request must be initiated within three (3) weeks from the time the incident or disagreement occurred.

The completed appeals request form is to be submitted to the Registration Office. The Registrar will act on the request and/or forward to the Vice President of Student Affairs for approval or denial.

Student Rights and Responsibilities continued

In certain appeals situations the appeals request may be forwarded to an administrator in the instructional areas for input/decision (for example, when there is a student appeal over a course grade given by an instructor).

The college will act on the student appeals request in a timely manner. In most situations, a decision will be made within two weeks of the date the appeals request is received by the Registration Office. A copy of the decision will be mailed to the student's home address and one copy will be maintained in the student's file.

Upon receiving the decision from the Registrar or Vice President of Student Affairs, the student may request to further appeal the decision the Vice President of Academic Affairs. Students must indicate on the form their intention to further appeal the decision, sign and date the form, and return it to the Registrar within seven (7) school days. The appeal will then be forwarded to the Vice President of Academic Affairs, who will make a decision on the request within two (2) working weeks.

Appeals Review Committee

Occasionally an appeal request may be of such a nature that it may be in the best interest of the student and the school to convene an Appeals Review Committee to advise the campus administration on the request. It will be determined by either the Vice President of Student Affairs or the Vice President of Academic Affairs whether to assemble an Appeals Review Committee.

Representation on the Review Committee typically would include, but is not limited to, three (3) to five (5) members from the following list of individuals: Vice President of Student Affairs, Registrar, Instructor, Counselor, Disability Services Coordinator, Student Representative.

Appeal to President

If a student contests the appeals decision made on campus, the student has the right to further appeal to the President. The student shall submit the appeals request form and accompanying documentation to the President. The decision of the President is final.

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.

Collection and Release of Student Data

Data Privacy: Students' Rights, Responsibilities, and Authorizations for the Collection and Release of Data

1. **Information Collection**

    When you apply for admission, while you are enrolled and after graduation from Hennepin Technical College, you will be asked to supply information about yourself, including your social security number.

You will be asked to report information in the following ways:

- Admissions Application
- Enrollment Form
- Financial Aid Application
- Assessment Process
- Placement and Employment Follow-up Information Forms
- Oral interviews with college staff
- Health Records
- Disability documentation, if applicable

2. **Use of Information**

The data is being collected to:

- Report to the Board of Trustees of the Minnesota State Colleges and Universities.
- Report to the Higher Education Services Office.
- Assist technical college staff in developing a plan to help you succeed in your program/major area.
- Create statistical and research reports.
- Assist the technical college in auditing employment follow-up data and other college policies and practices.
- Respond to requests for information from Federal Agencies and Departments and the public.
- Comply with the state immunization law.
- Your social security number is requested to create a unique student identification number, which will be used to identify testing, academic, and employment follow-up information about you. Submitting your social security number is voluntary.

The number is requested under the authority granted to the technical colleges through enabling state legislation. Your social security number may be used to identify you for statistical reports conducted between state agencies. Financial aid recipients are also required to supply their social security number.

- Provide to the Department of Human Services data necessary for the administration of the Child Support Enforcement Program.

3. **Student Rights**

Hennepin Technical College maintains records about you in various places within the institution. For example, the Admissions Office maintains records about you, as does the Registrar. Under federal and state law, you have certain rights concerning the records which HTC maintains. This notice is to make you aware of those rights.

Should you have questions concerning your rights, please contact the Registrar's Office at: 9000 Brooklyn Boulevard, Brooklyn Park, MN 55445.

Under the Minnesota Government Data Practices Act (MGDPA) and the Family and Educational Rights Privacy Act (FERPA), you have a right:

- to refuse to provide any or all of the data requested;
- to inspect and review educational records maintained about you;
- to request an amendment to records about you for the purpose of correcting inaccurate or misleading records, or records which violate your privacy or other rights in some fashion;

- to a hearing regarding records which you believe are inaccurate or misleading, if HTC does not amend the records at your request;

- to place a written statement explaining your disagreement with HTC in your records, if HTC does not amend records after the opportunity for a hearing about whether the records are inaccurate or misleading;

- to consent to disclosures of information which identifies you personally, except to the extent that such disclosures are allowed without your consent under state and federal law;

  FERPA and the MGDPA permit disclosures without consent to school officials with legitimate educational interests. A school official is a person employed by HTC in an administrative, supervisory, academic, or support staff position, a person or company with whom HTC has contracted, a student serving on official College committees, a person serving on the Board of Trustees or in the Office of the Chancellor, or assisting another school official in performing his or her tasks. A school official has legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibility.

- to file a complaint with the United States Department of Education if you believe that the College is not meeting the requirements of the federal law. Written complaints should be sent to the Family Policy Compliance Office, U.S. Dept. of Education, 600 Independence Avenue SW, Washington, D.C. 20202-4605.

- to obtain a copy of HTC's complete policy regarding educational records. The College has copies of the policy available from the Registrar's Office.

4. **Consequences**

   There are consequences for not supplying data, which may result in denial of the following services:

   - You might not be admitted for enrollment if you do not complete the admissions application (except social security number) and optional information.

   - You will not receive disability services if you do not identify a need for services.

   - You will not receive financial aid assistance if you do not provide information on the financial aid forms.

   - You might not receive assistance in occupational placement if you do not provide that data.

   - You will not continue in school if you do not comply with immunization information as required by law.

   - You will be assigned a student identification number if you do not provide your social security number.

   - You will not be assigned a PIN if you do not provide either your date of birth or social security number.

5. **Student Access to 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. Student members of the committee are selected by the campus Student Senate.

Phi Theta Kappa

Students earning a 3.5 GPA and successfully completing 12 college level credits in an A.S. degree, A.A.S. degree 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 a graduate's diploma and transcript. 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.

Pangea Multicultural Club

Pangea's mission is to bring cultural awareness by organizing multicultural activities and reflect diversity within the Hennepin Technical College community. International Day is a biannual event held in the cafeteria at both campuses where students get the chance to try different ethnic food, watch performers presenting music from various regions of the world, world bazaar, and calligraphers who write names in different languages and design body artwork. Pangea club is open to all students.

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.

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.

Emergency Evacuation

If you are a student with a mobility impairment, we ask that you contact one of the following individuals as soon as you register for classes so that we may better assist you in the event of emergency evacuations or drills:

Bob Nehring, Safety Director,
Brooklyn Park and Eden Prairie Campuses
(763) 488-2506

Sara Laviolette, Disability Services Coordinator, Brooklyn Park Campus
(763) 488-2477

John Heinrichs, Disability Services Coordinator, Eden Prairie Campus
(952) 995-1544

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. The report is available on the HTC website or from the HTC 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 for more information about the disease and how to prevent it.

Health, Safety, and Security

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 if their attendance does not create a substantial risk of the transmission of illness to other students or employees of the college.

The complete policy is available on the HTC website.

Latex Free

Hennepin Technical College promotes a latex free environment.

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 Admissions 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

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. 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. The college assumes no responsibility for housing information or housing referrals that are posted or appear in those publications.

Student ID Cards

All students are encouraged to obtain a HTC student ID card. Student ID cards will be required for use of IMC materials and to utilize the Student Computer Labs. HTC uses Smart Card technology which allows students to deposit funds on the card and then use it to make purchases from food service, the bookstore, vending machines, and copiers/printers in the Student Computer Lab. Student ID cards are issued in the Student Computer Lab to current students with a semester schedule and photo identification. The first Student ID card issued to a student is free; replacement cards are $10 each. The $10 fee must be paid at the Tuition Office before the replacement card can be picked up.

Library

Supporting the curriculum of the college, our libraries are important components of the learning environment at Hennepin Technical College. Students have access to each library's collection through MnPALS, our new online database, which provides access not only to the collections of HTC's libraries but also to the collections of Minnesota state universities, community and technical colleges, and others. Students are provided access to materials in other libraries through inter-library loan.

Students can take advantage of library tours and library presentations, which present information on the resources available and how to access them.

The libraries provide Internet access at each of the MnPALS workstations, including access to Microsoft Office for word processing. TV/VCR/DVD units are provided for students who are required to view videotapes for their classes. Ten laptops at each campus are available for student checkout. Free printing with student smart card is also available.

Other Information continued

The libraries are open Monday-Thursday from 7:00 a.m. to 8:30 p.m. and Friday from 7:00 a.m. to 3:30 p.m.

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 a current HTC Student ID 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. Approximately 500 volunteers serve on about 40 program advisory committees. The members come from a cross-section of business and industry.

Advisory committees guide, strengthen, and improve programs. Members are selected because they 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 and Information Technology

Accounting Careers			
Associate in Applied Science Degree	Accounting (BP/EP)	64 Credits	Page 49
Diploma	Accounting Technician (BP/EP)	32 Credits	Page 50
Business			
Associate in Applied Science Degree	Business Analyst (BP/EP)	64 Credits	Page 51
Occupational Certificate	Business Management (BP/EP)	22 Credits	Page 52
Information Technology/Computer Careers			
Associate in Applied Science Degree	Network Administrator/ Analyst (BP/EP)	72 Credits	Page 53
Associate in Applied Science Degree	Programmer (BP/EP)	72 Credits	Page 54
Associate in Applied Science Degree	PC Support Specialist (BP)	72 Credits	Page 56
Associate in Applied Science Degree	Web Programmer (BP/EP)	72 Credits	Page 57
Associate in Applied Science Degree	IT Audit (BP/EP)	64 Credits	Page 59
Diploma	PC Support Specialist (BP)	64 Credits	Page 60
Diploma	Network Administrator/ Analyst (BP/EP)	64 Credits	Page 61
Diploma	Visual Basic Programmer (EP)	64 Credits	Page 62
Diploma	Web Programmer (BP/EP)	64 Credits	Page 63
Diploma	Workplace Administrative Professional (BP/EP)	36 Credits	Page 65
Advanced Technical Certificate	Visual Basic Programmer (EP)	24 Credits	Page 66
Advanced Technical Certificate	Windows Networking (BP/EP)	27 Credits	Page 67
Advanced Technical Certificate	Linux Networking (BP/EP)	26 Credits	Page 67
Advanced Technical Certificate	Microsoft Database Specialist (EP)	24 Credits	Page 67
Advanced Technical Certificate	Java Programmer (BP/EP)	24 Credits	Page 68
Advanced Technical Certificate	Cisco Networking (EP)	27 Credits	Page 68
Advanced Technical Certificate	Network Security (BP/EP)	30 Credits	Page 69
Advanced Technical Certificate	IT Audit Specialist (BP/EP)	30 Credits	Page 70
Occupational Certificate	Workplace Administrative Assistant (BP/EP)	26 Credits	Page 70
Occupational Certificate	Computer Service Desk Technician (BP/EP)	28 Credits	Page 71

Business and Information Technology

Medical Office Careers			
Associate in Applied Science Degree	Medical Administrative Assistant (BP/EP)	66 Credits	Page 72
Diploma	Medical Administrative Assistant (BP/EP)	49 Credits	Page 73
Diploma	Medical Coding Specialist (BP/EP)	42 Credits	Page 74
Occupational Certificate	Medical Transcriptionist (BP/EP)	29 Credits	Page 74
Occupational Certificate	Medical Receptionist (BP/EP)	28 Credits	Page 75
Residential Property Management			
Occupational Certificate	Residential Property Management (Online)	16 Credits	Page 76

Business and Information Technology

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
ACCT2200	Intermediate Accounting I	4
ACCT2205	Intermediate Accounting II	4
ACCT2210	Cost Accounting	4
ACCT2220	Managerial Accounting	3
ACCT2231	Income Tax	4
BUSN1140	Business Law	3

General Education Required   15 Credits

COMM2050 or	Interpersonal Communication	3
COMM2060 or	Small Group Communication	3
COMM2130	Public Speaking	3
ENGL2121 or	Writing and Research	4
ENGL2125	Technical Writing	3
MATH2100 or	Concepts in Mathematics	3
MATH2150 or	Introduction to Statistics	3
MATH2200	College Algebra	4
PHIL2200	Ethics	3
SSCI2200	Principles of Microeconomics	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   **4 Credits**

Any ACCT, BUSN 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	3

General Education Required   **6 Credits**

COMM2050	Interpersonal Communication	3
or		
COMM2060	Small Group Communication	3
or		
COMM2130	Public Speaking	3
PHIL2200	Ethics	3

Technical Studies Elective   **3 Credits**

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

    Total Diploma   **32 Credits**

BUSINESS

Associate in Applied Science Degree
Business Analyst (BP/EP)

Overview
A Business Analyst is a person who acts as a liaison or translator between business people who have a business problem and technology people who know how to create automated solutions to those problems. There is a demand for people who have technology expertise and the ability to apply business knowledge in solving problems face to face. Skill development includes training in areas such as business, management, ethics, information systems, systems analysis, business law and e-business. Other areas may also include spreadsheets, databases, database design and project management.

To be a Business Analyst, a person must have other qualities. Some of these qualities include the ability to work well with others, the desire to be part of a team, and the ability to work with the unknown. Others include critical thinking, decision-making, problem-solving, questioning, diplomacy, and negotiation, along with good oral and written communication skills.

Career Opportunities
This occupational area includes the following career titles: Business Analyst, Technical Process Analyst, and Systems Analyst, to name a few. Business analysts work within banks, insurance companies, healthcare facilities, government agencies, educational institutions, retail industries, and various service and manufacturing businesses.

Technical Studies Required   46 Credits

Code	Course	Credits
ACCT1125	Excel	3
BUSN1000	Introduction to Business	3
BUSN1050	Introduction to Management	3
BUSN1140	Business Law	3
BUSN1200	Managerial Communication	3
BUSN1300	E-Business	3
BUSN2100	Capstone	3
CCIS1000	Information Systems	3
CCIS1031	Access	4
CCIS2055	Project Management	3
CCIS2701	Database Design and SQL	4
CCIS2801	Systems Analysis	4
CCIS2900	IT Systems Management	3
COMM1016	Team Building in the Workplace	2
COMM1131	Customer Service in the Workplace	2

General Education Required   18 Credits

Code	Course	Credits
COMM2130	Public Speaking	3
ENGL2121	Writing and Research	4
MATH2200	College Algebra	4
PHIL2100	Critical Thinking	3
PHIL2300	Business Ethics	4

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

Occupational Certificate
Business Management (BP/EP)

Overview

This certificate will provide skill development and training in areas such as business, management and e-business.

To be successful in this area, a person must have special personal qualities including the ability to work well with others, the desire to be a part of a team, decision-making, and good oral and written communication skills.

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 occupational area complements any other certificate, diploma or degree. Someone with this certificate will work within banks, insurance companies, health care facilities, government agencies, educational institutions, retail industries, and various service and manufacturing businesses.

Technical Studies Required   22 Credits

BUSN1000	Introduction to Business	3
BUSN1050	Introduction to Management	3
BUSN1100	Supervision	3
BUSN1140	Business Law	3
BUSN1200	Managerial Communication	3
BUSN1300	E-Business	3
COMM1016	Team Building in the Workplace	2
COMM1131	Customer Service in the Workplace	2

Total Occupational Certificate **22 Credits**

INFORMATION TECHNOLOGY/COMPUTER CAREERS

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

Overview
This degree provides the skills needed to design, manage, troubleshoot and secure a network environment. Platforms include Windows 2000/XP, Linux, Cisco and the Internet. Skill development includes data communications, TCP/IP, hardware, software, network operating systems, and security.

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

Technical Studies Required		49 Credits
CCIS1105	Network Essentials	4
CCIS1110	Windows Admin 1	3
CCIS1121	Linux Admin 1	3
CCIS1301	XHTML	3
CCIS1421	CCNA-2: Routers & Routing Basics	4
CCIS1431	CCNA-3: Switching Basics & Intermediate Routing	4
CCIS1505	Fundamentals of Programming	4
or		
CCIS1515	Web Programming Overview	3
CCIS2122	Linux Admin 2	4
CCIS2150	Windows Admin 2	4
CCIS2161	Linux Admin 3	3
CCIS2221	Network Configuration	4
CCIS2270	Windows Admin 3: IIS and Exchange	4
CCIS2841	Client/Server Computing	4
or		
CCIS2900	IT Systems Management	3

Choose one of the following:

MATH1011	Beginning Algebra	3
MATH1031	Intermediate Algebra	3
MATH2100	Concepts in Mathematics	3
MATH2200	College Algebra	4

General Education Required		12 Credits
ENGL2121	Writing and Research	4
or		
ENGL2125	Technical Writing	3

Choose one of the following:

COMM2060	Small Group Communication	3
MATH2100	Concepts in Mathematics	3
MATH2150	Introduction to Statistics	3
MATH2200	College Algebra	4
PHIL2100	Critical Thinking	3

Choose one of the following:

COMM2050   Interpersonal Communication. 3
PHIL2200   Ethics 3
PHIL2300   Business Ethics 4
SSCI2100   Introduction to Sociology. 3
SSCI2200   Principles of Microeconomics 3
SSCI2300   General Psychology 3

Choose one of the following:

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:

CCIS1080   Microsoft Office 2003 3
CCIS1351   Advanced XHTML 4
CCIS1441   CCNA-4: WAN Technologies 4
CCIS1450   CCNP-1: Advanced Routing. 4
CCIS1455   CCNP-2: Remote Access 4
CCIS2125   Intrusion Detection and Response. 4
CCIS2400   Information Security Essentials 3
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
Programmer (BP/EP)

Overview

This degree offers the skills necessary for computer application development and design. Either Visual Basic or Java will be used to design, code, document, and implement computer applications. Exposure to database management systems and Client/Server Computing 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
CCIS1301   XHTML. 3
CCIS1351   Advanced XHTML 4

CCIS1505   Fundamentals of Programming. 4
CCIS2550   Visual Basic I 4
    or
CCIS2595   Java I. 4
CCIS2560   Visual Basic II 4
    or
CCIS2651   Java II 4
CCIS2610   XML I 4
CCIS2645   Introduction to ASP.NET. 4
    or
CCIS2662   Java Server Pages (JSP). 4
CCIS2701   Database Design and SQL. 4
CCIS2751   Oracle PL/SQL 4
    or
CCIS2781   SQL Server - TransactSQL. 4
CCIS2801   Systems Analysis 4
CCIS2841   Client/Server Computing 4

Choose one of the following:

MATH1011   Beginning Algebra. 3
MATH1031   Intermediate Algebra 3
MATH2100   Concepts in Mathematics 3
MATH2200   College Algebra 4

General Education Required   12 Credits

ENGL2121   Writing and Research. 4
    or
ENGL2125   Technical Writing 3

Choose one of following:

COMM2060   Small Group Communication. 3
MATH2100   Concepts in Mathematics 3
MATH2150   Introduction to Statistics 3
MATH2200   College Algebra 4

Choose one of following:

COMM2050   Interpersonal Communication. 3
PHIL2200   Ethics. 3
PHIL2300   Business Ethics 4
SSCI2100   Introduction to Sociology. 3
SSCI2200   Principles of Microeconomics 3
SSCI2300   General Psychology 3

Choose one of following:

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:

CCIS2615	XML II	4
CCIS2630	PHP	4
CCIS2640	PERL/CGI	4
CCIS2645	Introduction to ASP.NET	4
CCIS2662	Java Server Pages (JSP)	4
CCIS2900	IT Systems Management	3

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   **52 Credits**

ACCT1125	Excel	3
CCIS1000	Information Systems	3
CCIS1031	Access	4
CCIS1035	Word for Windows	3
CCIS1042	PowerPoint	3
CCIS1101	Windows XP	3
CCIS1105	Network Essentials	4
CCIS1110	Windows Admin 1	3
CCIS1121	Linux Admin 1	3
CCIS1301	XHTML	3
CCIS1320	FrontPage	3
or		
CCIS1325	Web Publishing	3
CCIS2051	MS Office Integration/Outlook	4
CCIS2055	Project Management	3
CCIS2061	Help Desk/User Support	3
CCIS2601	A+ Hardware/Software Support	4
MATH1011	Beginning Algebra	3

General Education Required   **12 Credits**

ENGL2121	Writing and Research	4
or		
ENGL2125	Technical Writing	3

Choose one of following:

COMM2060	Small Group Communication	3
MATH2100	Concepts in Mathematics	3
MATH2150	Introduction to Statistics	3
MATH2200	College Algebra	4
PHIL2100	Critical Thinking	3

Choose one of following:

COMM2050	Interpersonal Communication	3
PHIL2200	Ethics	3
PHIL2300	Business Ethics	4
SSCI2100	Introduction to Sociology	3
SSCI2200	Principles of Microeconomics	3
SSCI2300	General Psychology	3

Choose one of following:

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 — **2 Credits**

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

Recommended:

CCIS1310	Publisher	3
CCIS1351	Advanced XHTML	4
CCIS2070	Database Projects	2
CCIS2080	Spreadsheet Projects	2
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
CCIS2900	IT Systems Management	3

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		**51 Credits**
CCIS1000	Information Systems	3
CCIS1101	Windows XP	3
CCIS1301	XHTML	3
CCIS1320	FrontPage	3
or		
CCIS1325	Web Publishing	3
CCIS1351	Advanced XHTML	4
CCIS1505	Fundamentals of Programming	4
CCIS2591	JavaScript	4
CCIS2595	Java I	4
CCIS2610	XML I	4
CCIS2651	Java II	4
CCIS2630	PHP	4
or		
CCIS2640	PERL/CGI	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

Choose one of following:

MATH1011	Beginning Algebra	3
MATH1031	Intermediate Algebra	3
MATH2100	Concepts in Mathematics	3
MATH2200	College Algebra	4

General Education Required		**12 Credits**
ENGL2121	Writing and Research	4
or		
ENGL2125	Technical Writing	3

Choose one of following:

COMM2060	Small Group Communication	3
MATH2100	Concepts in Mathematics	3
MATH2150	Introduction to Statistics	3
MATH2200	College Algebra	4

Choose one of following:

COMM2050	Interpersonal Communication	3
PHIL2200	Ethics	3
PHIL2300	Business Ethics	4
SSCI2100	Introduction to Sociology	3
SSCI2200	Principles of Microeconomics	3
SSCI2300	General Psychology	3

Choose one of following:

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:

CCIS1310	Publisher	3
CCIS2005	C# and the Microsoft .NET Framework	4
CCIS2255	Web Portfolio I	1
CCIS2256	Web Portfolio II	1
CCIS2311	Web Programmer Internship	2-8
CCIS2615	XML II	4
CCIS2640	PERL/CGI	4
CCIS2645	Introduction to ASP.NET	4
CCIS2662	Java Server Pages (JSP)	4
CCIS2841	Client/Server Computing	4
CCIS2900	IT Systems Management	3

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

Associate in Applied Science Degree
IT Audit (BP/EP)

Overview

Recent changes in the law have brought about an increased demand for IT Auditors. IT Auditors evaluate the policies, procedures, and automated processes designed to ensure that information stored and processed by computerized systems is protected from unauthorized modification, deletion, or disclosure. IT Auditors use skills in information technology, accounting, auditing, and business to provide management with assurance that adequate and reliable internal controls are in place and are operating in an efficient and effective manner. Other skill areas include business ethics, business law, and information security.

To be an IT Auditor, a person must have the ability to work cooperatively with others in a team setting. An IT Auditor should also possess strong written and oral communication skills, as well as critical thinking, decision-making, problem-solving, questioning, diplomacy, and negotiation skills.

Career Opportunities

Many IT auditors work in Internal Audit departments of companies in a variety of industries. Others work for consulting firms that provide outsourced Internal Audit services to clients, or for Public Accounting firms.

Technical Studies Required   46 Credits

ACCT1100	Principles of Accounting I	4
ACCT1105	Principles of Accounting II	4
BUSN1140	Business Law	3
CCIS1000	Information Systems	3
CCIS1105	Network Essentials	4
CCIS1505	Fundamentals of Programming	4
CCIS2400	Information Security Essentials	3

CCIS2701	Database Design and SQL	4
CCIS2801	Systems Analysis	4
CCIS2865	IT Auditing I	4
CCIS2870	IT Auditing II	4
CCIS2900	IT Systems Management	3
COMM1016	Team Building in the Workplace	2
or		
COMM1131	Customer Service in the Workplace	2

General Education Required   **18 Credits**

COMM2130	Public Speaking	3
ENGL2121	Writing and Research	4
MATH2200	College Algebra	4
PHIL2100	Critical Thinking	3
PHIL2300	Business Ethics	4

Total Associate in Applied Science Degree   **64 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	3
CCIS1042	PowerPoint	3
CCIS1101	Windows XP	3
CCIS1105	Network Essentials	4
CCIS1110	Windows Admin 1	3
CCIS1121	Linux Admin 1	3
CCIS1301	XHTML	3
CCIS1320	FrontPage	3
or		
CCIS1325	Web Publishing	3
CCIS2051	MS Office Integration/Outlook	4
CCIS2055	Project Management	3
CCIS2061	Help Desk/User Support	3
CCIS2601	A+ Hardware/Software Support	4

General Education Required   **9 Credits**

COMM1016	Team Building in the Workplace	2
or		
COMM1040	Job Seeking Skills	2

COMM1050	Communication in the Workplace	2
or		
COMM1131	Customer Service in the Workplace	2
ENGL1021	Essay Fundamentals	3
or		
ENGL1026	Essentials of Technical Writing	3
MATH1005	Business Mathematics	2
or		
MATH1011	Beginning Algebra	3

Technical Studies Elective   **6 Credits**

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

Recommended:

CCIS1310	Publisher	3
CCIS1351	Advanced XHTML	4
CCIS2070	Database Projects	2
CCIS2080	Spreadsheet Projects	2
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
CCIS2900	IT Systems Management	3

Total Diploma   **64 Credits**

Diploma
Network Administrator/Analyst (BP/EP)

Overview

This diploma provides the skills needed to design, manage, troubleshoot and secure a network environment. Platforms include Windows 2000/XP, Linux, Cisco and the Internet. Skill development includes data communications, TCP/IP, hardware, software, network operating systems, and security.

Career Opportunities

Positions are available as Network Administrators or Network Developers.

Technical Studies Required   **44 Credits**

CCIS1000	Information Systems	3
CCIS1080	Microsoft Office 2003	3
CCIS1101	Windows XP	3
CCIS1105	Network Essentials	4
CCIS1110	Windows Admin 1	3
CCIS1121	Linux Admin 1	3
CCIS1301	XHTML	3
CCIS1421	CCNA-2: Routers & Routing Basics	4
CCIS1505	Fundamentals of Programming	4
or		
CCIS1515	Web Programming Overview	3
CCIS2122	Linux Admin 2	4
CCIS2150	Windows Admin 2	4
CCIS2221	Network Configuration	4

CCIS2841   Client/Server Computing 4
   or
CCIS2900   IT Systems Management. 3

General Education Required   9 Credits

Choose two of the following:

COMM1016   Team Building in the Workplace. 2
COMM1040   Job Seeking Skills 2
COMM1050   Communication in the Workplace 2
COMM1131   Customer Service in the Workplace 2

Choose one of following:

ENGL1021   Essay Fundamentals 3
ENGL1026   Essentials of Technical Writing. 3

Choose one of following:

MATH1005   Business Mathematics. 2
MATH1011   Beginning Algebra. 3
MATH1031   Intermediate Algebra 3
MATH2100   Concepts in Mathematics 3
MATH2150   Introduction to Statistics 3

Technical Studies Elective   11 Credits

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

Recommended:

CCIS1351   Advanced XHTML 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
CCIS2125   Intrusion Detection and Response. 4
CCIS2161   Linux Admin 3. 3
CCIS2270   Windows Admin 3: IIS and Exchange 4
CCIS2591   JavaScript. 4
CCIS2601   A+ Hardware/Software Support. 4
CCIS2701   Database Design and SQL. 4
CCIS2900   IT Systems Management 3

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   41 Credits

CCIS1000   Information Systems 3
CCIS1031   Access. 4
CCIS1101   Windows XP 3
CCIS1301   XHTML. 3
CCIS1505   Fundamentals of Programming. 4
CCIS2550   Visual Basic I 4
CCIS2560   Visual Basic II 4
CCIS2701   Database Design and SQL. 4
CCIS2751   Oracle PL/SQL 4
   or
CCIS2781   SQL Server - TransactSQL. 4
CCIS2801   Systems Analysis 4
CCIS2841   Client/Server Computing 4

General Education Required   9 Credits

Choose two of the following:

COMM1016   Team Building in the Workplace. 2
COMM1040   Job Seeking Skills 2
COMM1050   Communication in the Workplace 2
COMM1131   Customer Service in the Workplace 2

Choose one of following:

ENGL1021   Essay Fundamentals 3
ENGL1026   Essentials of Technical Writing. 3

Choose one of following:

MATH1005   Business Mathematics. 2
MATH1011   Beginning Algebra. 3

Technical Studies Elective   14 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
CCIS2640   PERL/CGI. 4
CCIS2645   Introduction to ASP.NET. 4
CCIS2900   IT Systems Management. 3

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	XHTML	3
CCIS1320	FrontPage	3
or		
CCIS1325	Web Publishing	3
CCIS1351	Advanced 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		
CCIS2640	PERL/CGI	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   9 Credits

COMM1016	Team Building in the Workplace	2
or		
COMM1040	Job Seeking Skills	2
COMM1050	Communication in the Workplace	2
or		
COMM1131	Customer Service in the Workplace	2
ENGL1021	Essay Fundamentals	3
or		
ENGL1026	Essentials of Technical Writing	3
MATH1005	Business Mathematics	2
or		
MATH1011	Beginning Algebra	3

Technical Studies Elective   7 Credits

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

Recommended:

CCIS1310	Publisher	3
CCIS2055	Project Management	3
CCIS2255	Web Portfolio I	1
CCIS2256	Web Portfolio II	1
CCIS2311	Web Programmer Internship	2-8
CCIS2615	XML II	4
CCIS2630	PHP	4

CCIS2640	PERL/CGI 4
CCIS2645	Introduction to ASP.NET 4
CCIS2662	Java Server Pages (JSP) 4
CCIS2841	Client/Server Computing 4
CCIS2900	IT Systems Management 3

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	**25 Credits**
ACCT1000	Bookkeeping 3
ACCT1125	Excel 3
CCIS1000	Information Systems 3
CCIS1031	Access 4
CCIS1035	Word for Windows 3
CCIS1042	PowerPoint 3
CCIS1080	Microsoft Office 2003 3
CCIS1101	Windows XP 3

General Education Required	**7 Credits**
COMM1016	Team Building in the Workplace 2
or	
COMM1050	Communication in the Workplace 2
ENGL1010	Business English 3
MATH1000	Prealgebra 2

Technical Studies Elective	**4 Credits**

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

Total Diploma	**36 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	Oracle PL/SQL	4
or		
CCIS2781	SQL Server - TransactSQL	4
CCIS2801	Systems Analysis	4
CCIS2841	Client/Server Computing	4
Total Advanced Technical Certificate		**24 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		27 Credits
CCIS2150	Windows Admin 2	4
CCIS2221	Network Configuration	4
CCIS2270	Windows Admin 3: IIS and Exchange	4
CCIS2430	Security Solutions-3 (Windows)	4
CCIS2841	Client/Server Computing	4
CCIS2900	IT Systems Management	3
Choose one of following:		
CCIS2591	JavaScript	4
CCIS2645	Introduction to ASP.NET	4
Total Advanced Technical Certificate		**27 Credits**

Advanced Technical Certificate
Linux 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		26 Credits
CCIS2122	Linux Admin 2	4
CCIS2161	Linux Admin 3	3
CCIS2221	Network Configuration	4
CCIS2435	Security Solutions-4 (Linux)	4
CCIS2841	Client/Server Computing	4
CCIS2900	IT Systems Management	3

Choose one of the following:

CCIS2591	JavaScript	4
CCIS2630	PHP	4
CCIS2640	PERL/CGI	4

Total Advanced Technical Certificate	**26 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		24 Credits
CCIS1031	Access	4
CCIS2550	Visual Basic I	4
CCIS2701	Database Design and SQL	4
CCIS2781	SQL Server - TransactSQL	4
CCIS2786	SQL Server - System Administration	4
CCIS2841	Client/Server Computing	4

Total Advanced Technical Certificate	**24 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		24 Credits
CCIS2595	Java I	4
CCIS2651	Java II	4
CCIS2662	Java Server Pages (JSP)	4
CCIS2701	Database Design and SQL	4
CCIS2751	Oracle PL/SQL	4
or		
CCIS2781	SQL Server - TransactSQL	4
CCIS2801	Systems Analysis	4
Total Advanced Technical Certificate		**24 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
CCIS1105	Network Essentials	4
or		
CCIS1410	CCNA-1: Networking Basics	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
CCIS2420	Security Solutions-1 (Cisco)	4
or		
CCIS2425	Security Solutions-2 (PIX)	4
Total Advanced Technical Certificate		**27 Credits**

Advanced Technical Certificate
Network Security (BP/EP)

Overview

Individuals with knowledge of information systems security are now considered to be an important part of most IT infrastructure teams. Roles cover a range of activities spanning from analysis, to design and implementation of security systems, to security monitoring and countermeasures and ongoing administration. Students will study the essentials of information security and the security aspects of common information technology platforms. Students will be exposed to techniques used to deploy and manage security systems and configure security solutions.

Prerequisite: Any student seeking to begin this program will need to demonstrate education and/or experience as a network administrator/engineer. Evidence of sufficient background would include (though not be limited to) one or more of the following:

- HTC's A.A.S./Diploma in Network Administration
- MCSA Certification
- MCSE Certification
- CCNA Certification
- CNA Certification
- Work Experience

Career Opportunities

Graduates of this program may begin their careers in a variety of entry-level positions, involving information systems security, such as network/security administrators or security systems technologists. These positions are typically part of a team working on projects that require designing, configuring, implementing and maintaining security solutions as part of IT infrastructure projects. In other roles, graduates may be part of teams involved in auditing and verifying existing security systems and suggesting ways to improve the same.

Technical Studies Required		30 Credits
CCIS2125	Intrusion Detection and Response	4
CCIS2400	Information Security Essentials	3
CCIS2410	Hacker Techniques and Tools	4
CCIS2415	Security Policies and Implementation Issues	3
CCIS2420 or	Security Solutions-1 (Cisco)	4
CCIS2425	Security Solutions-2 (PIX)	4
CCIS2430	Security Solutions-3 (Windows)	4
CCIS2435	Security Solutions-4 (Linux)	4
CCIS2450	System Forensics Investigation and Response	4
Total Advanced Technical Certificate		**30 Credits**

Advanced Technical Certificate
IT Audit Specialist (BP/EP)

Overview

Recent changes in the law have brought about an increase demand for IT Auditors. IT Auditors evaluate the policies, procedures, and automated processes designed to ensure that information stored and processed by computerized systems is protected from unauthorized modification, deletion, or disclosure. IT Auditors use skills in information technology, accounting, auditing, and business to provide management with assurance that adequate and reliable internal controls are in place and are operating in a efficient and effective manner. Other skill areas include business ethics, business law, and information security.

To be an IT Auditor, a person must have the ability to work cooperatively with others in a team setting. An IT Auditor should also possess strong written and oral communication skills, as well as critical thinking, decision-making, problem-solving, questioning, and diplomacy, and negotiation skills.

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

Many IT Auditors work in Internal Audit departments of companies in a variety of industries. Others work for consulting firms that provide outsourced Internal Audit services to clients, or for Public Accounting firms.

Technical Studies Required		30 Credits
ACCT1100	Principles of Accounting I	4
BUSN1140	Business Law	3
CCIS2701	Database Design and SQL	4
CCIS2801	Systems Analysis	4
CCIS2865	IT Auditing I	4
CCIS2870	IT Auditing II	4
CCIS2900	IT Systems Management	3
PHIL2300	Business Ethics	4
Total Advanced Technical Certificate		**30 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. CPLT1000 Computer Keyboarding or qualifying score on keyboarding assessment test. 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
CCIS1035	Word for Windows	3
CCIS1080	Microsoft Office 2003	3
COMM1016	Team Building 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 English	3
MATH1000	Prealgebra	2

Total Occupational Certificate   **26 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   **28 Credits**

CCIS1000	Information Systems	3
CCIS1080	Microsoft Office 2003	3
CCIS1101	Windows XP	3
CCIS1105	Network Essentials	4
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   **28 Credits**

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.

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		40 Credits
ACCT1000	Bookkeeping	3
ACCT1125	Excel	3
CCIS1035	Word for Windows	3
CCIS1080	Microsoft Office 2003	3
COMM1040	Job Seeking Skills	2
CPLT1005	Skill Building and Document Processing	3
ENGL1010	Business English	3
OFCR1301	Medical Terminology	4
OFCR1316	Medical Office Procedures	3
OFCR1331	Medical Transcription I	4
OFCR1335	Medical Coding Fundamentals	4
OFCR1340	Medical Office Management	3
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 8 Credits

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

Total Associate in Applied Science Degree	66 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.

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		36 Credits
ACCT1000	Bookkeeping	3
ACCT1125	Excel	3
CCIS1035	Word for Windows	3
CCIS1080	Microsoft Office 2003	3
CPLT1005	Skill Building and Document Processing	3
ENGL1010	Business English	3
OFCR1301	Medical Terminology	4
OFCR1316	Medical Office Procedures	3
OFCR1331	Medical Transcription I	4
OFCR1335	Medical Coding Fundamentals	4
OFCR1340	Medical Office Management	3

General Education Required		6 Credits
COMM1016 or	Team Building in the Workplace	2
COMM1050	Communication in the Workplace	2
COMM1040	Job Seeking Skills	2
MATH1000	Prealgebra	2

General Education Elective   **2 Credits**

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

Technical Studies Elective   **5 Credits**

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

Total Diploma   **49 Credits**

Diploma
Medical Coding Specialist (BP/EP)

This program is offered in partnership with Anoka Technical College, and the award is issued by Anoka Technical College.

Overview
Medical coders are clinical data professionals who translate written medical documentation into alpha-numeric codes to comply with medical reimbursement procedures and health information data requirements. Accuracy and knowledge of patient confidentiality laws are required.

Career Opportunities
Career opportunities are available for individuals in health care settings such as clinics, hospitals, and nursing homes.

Note: A minimum course grade of a "C" must be earned in each of the courses to meet graduation requirements.

The following courses are offered at Hennepin Technical College:

OFCR 1301	Medical Terminology	4
CPLT 1005	Skill Building and Document Processing	3
CCIS 1080	Microsoft Office 2003	3
NURS 1111	Anatomy & Physiology	5
COMM 2050	Interpersonal Communication	3
ACCT 1125	Excel	3

The following courses are offered at Anoka Technical College:

(Many of these courses are offered online.)

ADSC 1231	ICD-9CM Coding	3
NURS 1140	Pharmacology	1
ADSC 1221	Intro to Health Information Management	3
ADSC 1240	Coding & Reimbursement for Physician's Services	3
ADSC 1244	Legal and Ethical Aspects in Health Care	2
ADSC 1249	Advanced Coding & Reimbursement	2
HLTH 1000	Disease Conditions	2
ENGL 1105	Composition I	4
ADSC 1252	Professional Practice for Coding Specialists	3

Total Diploma   **42 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		29 Credits
CCIS1035	Word for Windows	3
CCIS1080	Microsoft Office 2003	3
CPLT1005	Skill Building and Document Processing	3
ENGL1010	Business English	3
OFCR1301	Medical Terminology	4
NURS1111	Anatomy and Physiology	5
OFCR1331	Medical Transcription I	4
OFCR2331	Medical Transcription II	4
Total Occupational Certificate		**29 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		22 Credits
ACCT1000	Bookkeeping	3
CCIS1035	Word for Windows	3
CCIS1080	Microsoft Office 2003	3
CPLT1005	Skill Building and Document Processing	3
ENGL1010	Business English	3
OFCR1301	Medical Terminology	4
OFCR1316	Medical Office Procedures	3

General Education Required		6 Credits
COMM1016 or	Team Building in the Workplace	2
COMM1050	Communication in the Workplace	2
COMM1040	Job Seeking Skills	2
MATH1000	Prealgebra	2
Total Occupational Certificate		**28 Credits**

RESIDENTIAL PROPERTY MANAGEMENT

Occupational Certificate
Residential Property Management (ONLINE)

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-Unit Property	4
RPMG1205	Budgeting and Financial Administration of Multi-Unit Property	4
RPMG1305	Managing the Ground and Physical Plant of Multi-Unit Property	4
RPMG1405	Managing People in the Property Management Industry	4
Total Occupational Certificate		**16 Credits**

Construction and Building Careers
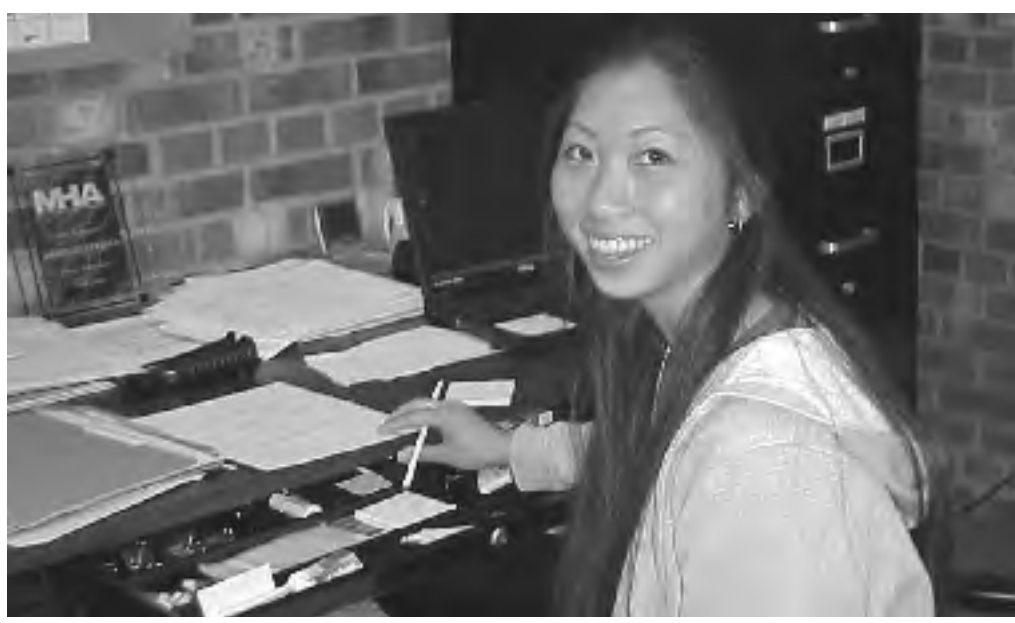
Construction and Building Careers

ARCHITECTURAL DRAFTING

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

Overview
The primary focus of student training is the preparation of construction documents for projects typically found in the residential and commercial building industry. Students learn how to analyze project requirements and produce construction documents that describe those requirements utilizing the most recent release of AutoCAD software. Other skills developed include the understanding of building material use and application and researching building codes. Students also gain experience in construction cost estimating, basic structural design, office practices and other relevant computer software.

Career Opportunities
Students in the Architectural Drafting and Design program are prepared for entry-level employment in a design or construction related position within the architecture, engineering or construction industry. Employment opportunities range from Computer-Aided Drafting and Design (CADD) technicians working in architectural, engineering or building firms to estimators working with contractors to detailers and representatives working with material and product suppliers. Hennepin Technical College graduates have advanced to senior positions in many area architecture, engineering or construction offices with experience and continuing education.

Technical Studies Required   54 Credits

ARCH1001	Introduction to Architectural Drafting	2
ARCH1006	Architectural Drafting I	3
ARCH1011	Architectural Drafting II	5
ARCH1100	Architectural CAD: Basic AutoCAD	4
ARCH1202	Materials and Methods of Construction I	2
ARCH1206	Strength of Materials	3
ARCH1340	Building Codes	2
ARCH1345	Building Systems	3
ARCH1480	Architectural Practices and Procedures	3
ARCH2121	Architectural Drafting III	5
ARCH2141	Architectural Drafting IV	5
ARCH2330	Architectural Presentation	3
ARCH2340	Design Development for Architectural Drafting	3
ARCH2351	Architectural CAD: 3D AutoCAD	4
or		
ARCH2360	Architectural CAD: Architectural Desktop (ADT)	4
or		
ARCH2370	Architectural CAD: Revit	4
ARCH2466	Materials and Methods of Construction II	2
ARCH2561	Estimating	3
MATH1000	Prealgebra	2

General Education Required   12 Credits

COMM2060   Small Group Communication 3
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
Architectural Drafting and Design (BP/EP)

Overview

The primary focus of student training is the preparation of construction documents for projects typically found in the residential and commercial building industry. Students learn how to analyze project requirements and produce construction documents that describe those requirements utilizing the most recent release of AutoCAD software. Other skills developed include the understanding of building material use and application and researching building codes. Students also gain experience in construction cost estimating, basic structural design, office practices and other relevant computer software.

Career Opportunities

Students in the Architectural Drafting and Design program are prepared for entry-level employment in a design or construction related position within the architecture, engineering or construction industry. Employment opportunities range from Computer-Aided Drafting and Design (CADD) technicians working in architectural, engineering or building firms to estimators working with contractors to detailers and representatives working with material and product suppliers. Hennepin Technical College graduates have advanced to senior positions in many area architecture, engineering or construction offices with experience and continuing education.

Technical Studies Required   52 Credits

ARCH1001   Introduction to Architectural Drafting 2
ARCH1006   Architectural Drafting I 3
ARCH1011   Architectural Drafting II 5
ARCH1100   Architectural CAD: Basic AutoCAD 4
ARCH1202   Materials and Methods of Construction I 2
ARCH1206   Strength of Materials 3
ARCH1340   Building Codes 2
ARCH1345   Building Systems 3
ARCH1480   Architectural Practices and Procedures 3
ARCH2121   Architectural Drafting III 5
ARCH2141   Architectural Drafting IV 5
ARCH2330   Architectural Presentation 3
ARCH2340   Design Development for Architectural Drafting 3

ARCH2351   Architectural CAD: 3D AutoCAD 4
   or
ARCH2360   Architectural CAD: Architectural Desktop (ADT) 4
   or
ARCH2370   Architectural CAD: Revit 4
ARCH2466   Materials and Methods of Construction II 2
ARCH2561   Estimating 3

General Education Required   4 Credits

COMM1016   Team Building in the Workplace 2
   or
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   4 Credits

ARCH1225   Technical Drawing 1
ARCH1230   Sketching 1
ARCH1245   Surveying for Architectural Technicians 1
ARCH1900   Specialized Lab 1-4
ARCH2351   Architectural CAD: 3D AutoCAD 4
ARCH2360   Architectural CAD: Architectural Desktop (ADT) 4
ARCH2370   Architectural CAD: Revit 4
ARCH2640   Architectural History 3
ARCH2710   Architectural Model Building 3
ARCH2900   Internship 2-4

   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		51 Credits
CBTG1110	Basic Joinery	2
CBTG1120	Power Tool Operation	3
CBTG1130	Materials	1
CBTG1141	Basic Case Construction	4
CBTG1161	Basic Laminating	2
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
CBTG2450	Solid Surface Fabrication	2
CBTG2512	Introduction to AutoCAD	4
or		
CBTG1150	Drafting Techniques	2
and		
CBTG2440	Introduction to Cabinetware	3
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

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

CBTG1240	Millroom Operations	2
CBTG1900	Specialized Lab	1-4
CBTG2430	Furniture Fabrication	4
CBTG2440	Introduction to Cabinetware	3
CBTG2512	Introduction to AutoCAD	4
CBTG2522	CNC Router Programming	3
CBTG2532	CNC Router Operation	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   49 Credits

CBTG1110	Basic Joinery	2
CBTG1120	Power Tool Operation	3
CBTG1130	Materials	1
CBTG1141	Basic Case Construction	4
CBTG1161	Basic Laminating	2
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
CBTG2450	Solid Surface Fabrication	2
CBTG2512	Introduction to AutoCAD	4
or		
CBTG1150	Drafting Techniques	2
and		
CBTG2440	Introduction to Cabinetware	3

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 · 7 Credits

CBTG1240	Millroom Operations	2
CBTG1900	Specialized Lab	1-4
CBTG2430	Furniture Fabrication	4
CBTG2440	Introduction to Cabinetware	3
CBTG2512	Introduction to AutoCAD	4
CBTG2522	CNC Router Programming	3
CBTG2532	CNC Router Operation	3
	Total Diploma	**64 Credits**

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

Overview

The CNC Machining for Wood and Plastics certificate is offered at Hennepin Technical College's Brooklyn Park Campus. 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.

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

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	Introduction to AutoCAD	4
CBTG2522	CNC Router Programming	3
CBTG2532	CNC Router Operation	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   **Credits 36**

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   54 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
HVAC2121	Refrigerated Coolers and Cases	4
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.

Total Associate in Applied Science Degree   72 Credits

Diploma
Residential Heating, Ventilation 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

Total Diploma	**33 Credits**

Diploma
Commercial Heating, Ventilation, 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 a minimum of 2 years related work experience.

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		**28 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
HVAC2060	Computer Room Air Conditioning	1
HVAC2100	Water Chiller Machines	3
HVAC2111	Low Pressure Steam and Water Boilers	2
HVAC2121	Refrigerated Coolers and Cases	4
HVAC2130	Supermarket Refrigeration	3
HVAC2165	Air Handling Units	1

General Education Required	**2 Credits**

COMM1016   Team Building in the Workplace 2
     or
COMM1040   Job Seeking Skills 2
     or
COMM1050   Communication in the Workplace 2
     or
ENGL1026   Essentials of Technical Writing. 3

General Education Elective	**2 Credits**

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

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.

Prerequisite: Successful completion of the Residential Heating, Ventilation and Air Conditioning program or a minimum of 2 years related work experience.

Career Opportunities

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

Technical Studies Required	**12 Credits**

HVAC2030   Commercial Ice Making Machines 3
HVAC2050   Electrical for Commercial HVAC&R Equipment 2
HVAC2121   Refrigerated Coolers and Cases. 4
HVAC2130   Supermarket Refrigeration 3

Total Advanced Technical Certificate	**12 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/or servicing and troubleshooting of 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**

Floral, Landscape and Horticulture Careers

Floral, Landscape and Horticulture Careers

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 blueprint 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/building firms or landscape construction businesses.

Technical Studies Required — 48 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
LNDC1202	Herbaceous Plants I	4
LNDC1231	Nursery Operations	2
LNDC1235	Landscape Operations	2
LNDC1242	Plant Biology	4
LNDC1271	Soil Science	3
LNDC2110	Introduction to Landscape Construction	2
LNDC2120	Landscape Construction I	4
LNDC2131	Landscape Construction II	3
LNDC2160	Landscape Design I	4
LNDC2171	Landscape Design II	3
LNDC2241	Landscape Equipment Operation	3
MATH1000	Prealgebra	2

General Education Required — 15 Credits

COMM2050	Interpersonal Communication	3
CPLT1100	Introduction to Personal Computers	3
ENGL2121	Writing and Research	4
or		
ENGL2125	Technical Writing	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   6 Credits

LNDC1131	Arboriculture I	3
LNDC1141	Nursery Propagation and Production	3
LNDC1210	Herbaceous Plants II	2
LNDC1220	Integrated Pest Management	2
LNDC1900	Specialized Lab	1-4
LNDC2100	Landscape Supervision	1
LNDC2180	Design Flower Beds	2
LNDC2210	Interior Foliage Plants	2
LNDC2220	Turf Culture and Management	3
LNDC2250	Landscape Management	2
LNDC2261	Professional Gardening	3
LNDC2271	Landscape Computer Design and Applications I	3
LNDC2280	Landscape Computer Design and Applications 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   49 Credits

LNDC1110	Introduction to Landscape/Horticulture	1
LNDC1120	Landscape Plants - Trees	4
LNDC1131	Arboriculture I	3
LNDC1141	Nursery Propagation and Production	3
LNDC1151	Insects and Diseases of Landscape Plants	3
LNDC1190	Landscape Plants - Shrubs	4
LNDC1202	Herbaceous Plants I	4
LNDC1220	Integrated Pest Management	2
LNDC1231	Nursery Operations	2
LNDC1235	Landscape Operations	2
LNDC1242	Plant Biology	4
LNDC1250	Bedding Plant Production	3
LNDC1271	Soil Science	3
LNDC2220	Turf Culture and Management	3
LNDC2241	Landscape Equipment Operation	3
LNDC2261	Professional Gardening	3
MATH1000	Prealgebra	2

General Education Required
15 Credits

COMM2050	Interpersonal Communication	3
CPLT1100	Introduction to Personal Computers	3
ENGL2121	Writing and Research	4
or		
ENGL2125	Technical Writing	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

LNDC1160	Greenhouse Operation and Management	2
LNDC1166	Greenhouse Crop Production - Fall	3
LNDC1176	Greenhouse Crop Production - 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
LNDC2131	Landscape Construction II	3
LNDC2150	Introduction to Basic Tree Climbing	2
LNDC2160	Landscape Design I	4
LNDC2180	Design Flower Beds	2
LNDC2210	Interior Foliage Plants	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		47 Credits
LNDC1110	Introduction to Landscape/Horticulture	1
LNDC1120	Landscape Plants - Trees	4
LNDC1131	Arboriculture I	3
LNDC1141	Nursery Propagation and Production	3
LNDC1151	Insects and Diseases of Landscape Plants	3
LNDC1190	Landscape Plants - Shrubs	4
LNDC1202	Herbaceous Plants I	4
LNDC1220	Integrated Pest Management	2
LNDC1231	Nursery Operations	2
LNDC1235	Landscape Operations	2
LNDC1242	Plant Biology	4
LNDC1250	Bedding Plant Production	3
LNDC1271	Soil Science	3
LNDC2220	Turf Culture and Management	3
LNDC2241	Landscape Equipment Operation	3
LNDC2261	Professional Gardening	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		9 Credits
LNDC1160	Greenhouse Operation and Management	2
LNDC1166	Greenhouse Crop Production - Fall	3
LNDC1176	Greenhouse Crop Production - 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
LNDC2131	Landscape Construction II	3
LNDC2150	Introduction to Basic Tree Climbing	2
LNDC2160	Landscape Design I	4
LNDC2180	Design Flower Beds	2
LNDC2210	Interior Foliage Plants	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 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 blueprint 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/building firms or landscape construction businesses.

Technical Studies Required		46 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
LNDC1202	Herbaceous Plants I	4
LNDC1231	Nursery Operations	2
LNDC1235	Landscape Operations	2
LNDC1242	Plant Biology	4
LNDC1271	Soil Science	3
LNDC2110	Introduction to Landscape Construction	2
LNDC2120	Landscape Construction I	4
LNDC2131	Landscape Construction II	3
LNDC2160	Landscape Design I	4
LNDC2171	Landscape Design II	3
LNDC2241	Landscape Equipment Operation	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		10 Credits
LNDC1131	Arboriculture I	3
LNDC1141	Nursery Propagation and Production	3
LNDC1210	Herbaceous Plants II	2
LNDC1220	Integrated Pest Management	2
LNDC1900	Specialized Lab	1-4
LNDC2100	Landscape Supervision	1
LNDC2150	Introduction to Basic Tree Climbing	2
LNDC2180	Design Flower Beds	2
LNDC2210	Interior Foliage Plants	2
LNDC2220	Turf Culture and Management	3
LNDC2250	Landscape Management	2
LNDC2261	Professional Gardening	3
LNDC2271	Landscape Computer Design and Applications I	3
LNDC2280	Landscape Computer Design and Applications 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 **26 Credits**

LNDC1110	Introduction to Landscape/Horticulture 1
LNDC1141	Nursery Propagation and Production 3
LNDC1160	Greenhouse Operation and Management 2
LNDC1166	Greenhouse Crop Production - Fall 3
LNDC1176	Greenhouse Crop Production - Winter 3
LNDC1220	Integrated Pest Management 2
LNDC1242	Plant Biology 4
LNDC1250	Bedding Plant Production 3
LNDC1271	Soil Science 3
LNDC2210	Interior Foliage Plants 2

General Education Required **4 Credits**

| COMM1050 | Communication in the Workplace . . . . 2 |
| MATH1000 | Prealgebra . . . . 2 |

Technical Studies Elective **8 Credits**

LNDC1120	Landscape Plants - Trees 4
LNDC1151	Insects and Diseases of Landscape Plants 3
LNDC1190	Landscape Plants - Shrubs 4
LNDC1202	Herbaceous Plants I 4
LNDC1900	Specialized Lab 1-4
LNDC2250	Landscape Management 2
LNDC2261	Professional Gardening 3
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 **38 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   18 Credits

LNDC1235	Landscape Operations	2
LNDC2110	Introduction to Landscape Construction	2
LNDC2120	Landscape Construction I	4
LNDC2131	Landscape Construction II	3
LNDC2241	Landscape Equipment Operation	3
LNDC2330	Landscape Construction Internship Certificate	4
	Total Advanced Technical Certificate	**18 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
LNDC1131	Arboriculture I	3
LNDC1151	Insects and Diseases of Landscape Plants	3
LNDC1190	Landscape Plants - Shrubs	4
LNDC2150	Introduction to Basic Tree Climbing	2
LNDC2341	Arboriculture Internship Certificate	3
	Total Occupational Certificate	**19 Credits**

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**

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, the student will perform many duties at chairside, assisting the dentist during patient treatment and completing records. The assistant must also be competent in the knowledge and skill required for business office and laboratory procedures. Upon completion of this program, you will be eligible to take the Minnesota State Board of Dentistry's Registration Exam. Passing this exam allows you to perform the expanded functions learned in the program on patients.

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. 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.

Prerequisite: CPLT1100, COMM2050 or COMM2060, ENGL2121 and SSCI1020 or currently certified in CPR for the Healthcare Provider.

Admission Requirements: Qualifying scores on the CPT reading and writing assessment tests.

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	Dental Team/Practice Management	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   13 Credits

COMM2050	Interpersonal Communication	3
or		
COMM2060	Small Group Communication	3
CPLT1100	Introduction to Personal Computers	3
ENGL2121	Writing and Research	4
PHIL2200	Ethics	3
or		
PHIL2400	Medical Ethics	4

General Education Elective   5 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 completing records. The assistant must also be competent in the knowledge and skill required for business office and laboratory procedures. Upon completion of this program, you will be eligible to take the Minnesota State Board of Dentistry's Registration Exam. Passing this exam allows you to perform the expanded functions learned in the program on patients.

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.

Prerequisite: CPLT1100, COMM2050 or COMM2060, ENGL2121 and SSCI1020 or currently certified in CPR for the Healthcare Provider.

Admission Requirements: Qualifying scores on the CPT reading and writing assessment tests.

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

Code	Course	Credits
DNTL1000	Dental Team/Practice Management	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		**12 Credits**
CPLT1100	Introduction to Personal Computers	3
COMM2050	Interpersonal Communication	3
or		
COMM2060	Small Group Communication	3
COMM1040	Job Seeking Skills	2
ENGL2121	Writing and Research	4

Total Diploma	**52 Credits**

EMERGENCY MEDICAL SERVICES

Occupational Certificate
Emergency Medical Services Specialist (EP)

Overview

The EMS Certificate provides enhanced entry-level job training for employment in a Basic Life Support (BLS) ambulance service and the 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 ride-along clinical 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 ambulance experience required for entry into paramedic programs.

Technical Studies Required		**16 Credits**
EMSV1100	Emergency Medical Technician - Basic	6
or		
EMSV1150	First Responder	3
and		
EMSV1175	EMT Bridge Course	3
or		
EMSV1250	First Responder Blended e-Learning	3
and		
EMSV1175	EMT Bridge Course	3
EMSV1105	Ambulance Operations	2
EMSV1110	Lifting Techniques for Health Professionals	1
EMSV1115	Passenger Assistant Technician	1
EMSV1120	Ambulance Clinical	2
EMSV1130	Emergency Vehicle Driving Skills	1
EMSV1146	Medical Terminology for EMS/ER Personnel	3

General Education Required		**2 Credits**
COMM1050	Communication in the Workplace	2
or		
COMM2050	Interpersonal Communication	3

Technical Studies Elective   5 Credits

COMM1040	Job Seeking Skills	2
CPLT1100	Introduction to Personal Computers	3
EMGT1100	Orientation to Emergency Management	3
EMSV1135	Understanding EKGs	1
EMSV1140	CPR Instructor	1
EMSV1155	Phlebotomy Techniques	3
EMSV1170	ER Procedures and Clinical	3
EMSV1180	Principles of Basic Life Support for Healthcare Providers	1
ENGL2121	Writing and Research	4

Total Occupational Certificate   **23 Credits**

Occupational Certificate
Emergency Room Technician (EP)

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 clinical 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 set-up 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 Hospital 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   17 Credits

EMSV1100	Emergency Medical Technician - Basic	6
or		
EMSV1150	First Responder	3
and		
EMSV1175	EMT Bridge Course	3
or		
EMSV1250	First Responder Blended e-Learning	3
and		
EMSV1175	EMT Bridge Course	3
EMSV1110	Lifting Techniques for Health Professionals	1
EMSV1135	Understanding EKGs	1
EMSV1146	Medical Terminology for EMS/ER Personnel	3
EMSV1155	Phlebotomy Techniques	3
EMSV1170	ER Procedures and Clinical	3

General Education Required   2 Credits

COMM1050	Communication in the Workplace	2
or		
COMM2050	Interpersonal Communication	3

Total Occupational Certificate   **19 Credits**

Health Careers

HEALTH UNIT COORDINATOR

Occupational Certificate
Health Unit Coordinator (BP)

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.

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.

Prerequisite: Student must score 72 or above on the CPT Reading Assessment Test.

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		15 Credits
HLUC1001	Health Unit Coordinator Fundamentals	3
HLUC1020	Medical Terminology	2
HLUC1050	Communication Skills for the Health Unit Coordinator	1
HLUC1061	Diagnostic and Therapeutic Procedures	3
HLUC1100	Processing Physician's Orders	3
HLUC1200	Health Unit Coordinator Internship	3

General Education Required		3 Credits
CPLT1100	Introduction to Personal Computers	3

| **Total Occupational Certificate** | | **18 Credits** |

PRACTICAL NURSING

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.

Prerequisite: 8-hour CPR course for Health Care Providers offered by the American Heart Association or 8-hour CPR/AED for the Professional Rescuer course offered by the American Red Cross or SSCI1020, NURS1001 taken within the last 3 years or currently on the MN Department of Health Registry with a minimum of a 75 hour course, ENGL2121, MATH1000, NURS1111, NURS1120, NURS1130, and qualifying score CPT reading, writing and math assessment tests.

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

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
NURS1103	Foundations I	4
NURS1201	Foundations II	4
NURS2300	Clinic Nursing	2
NURS2400	Capstone	2
MATH1000	Prealgebra	2

General Education Required   16 Credits

COMM2050	Interpersonal Communication	3
ENGL2121	Writing and Research	4
PHIL2200	Ethics	3
or		
PHIL2400	Medical Ethics	4
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   **65 Credits**

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. Prerequisite: 8-hour CPR course for Health Care Providers offered by the American Heart Association or 8-hour CPR/AED for the Professional Rescuer course offered by the American Red Cross or SSCI1020, NURS1001 taken within the last 3 years or currently on the MN Department of Health Registry with a minimum of a 75 hour course, ENGL2121, MATH1000, NURS1111, NURS1120, NURS1130, and qualifying score CPT reading, writing and math assessment tests.

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
NURS1103	Foundations I	4
NURS1201	Foundations II	4
NURS2300	Clinic Nursing	2
NURS2400	Capstone	2

General Education Required   **6 Credits**

ENGL2121	Writing and Research	4
MATH1000	Prealgebra	2

Total Diploma   **50 Credits**

Manufacturing and Engineering Technology

Machine Tool Technology

Associate in Applied Science Degree	Computer Numerical Control (CNC) Technician (BP)	72 Credits	Page 130
Associate in Applied Science Degree	Tool and Die/Moldmaking (BP)	72 Credits	Page 131
Diploma	Computer Numerical Control (CNC) Technician (BP)	64 Credits	Page 132
Diploma	Tool and Die/Moldmaking (BP)	64 Credits	Page 133
Advanced Technical Certificate	Computer Numerical Control (CNC) Setup Technician (BP)	17 Credits	Page 135
Advanced Technical Certificate	CNC Swiss Turning Center Technician (BP)	9 Credits	Page 135
Occupational Certificate	CNC Operator (BP)	30 Credits	Page 136

Manufacturing Engineering Technology

Associate in Applied Science Degree	Manufacturing Engineering Technology (BP/EP)	72 Credits	Page 137

Plastics Manufacturing Technology

Diploma	Plastics Manufacturing Technology (BP)	36 Credits	Page 140
Occupational Certificate	Extrusion Molding (BP)	14 Credits	Page 141
Occupational Certificate	Injection Molding (BP)	19 Credits	Page 141

Welding and Metal Fabrication

Diploma	Welding (BP)	54 Credits	Page 142
Occupational Certificate	Structural Iron Fabrication and Repair (BP)	23 Credits	Page 143
Occupational Certificate	GMAW Production Welder (MIG) (BP)	17 Credits	Page 143
Occupational Certificate	GTAW Production Welder (TIG) (BP)	17 Credits	Page 144

Manufacturing and
Engineering Technology

Manufacturing and Engineering Technology

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

ENGL2121	Writing and Research	4
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, METS, or ENGC 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, METS, or ENGC 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/set-up 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 Degre
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**
ENGL2121	Writing and Research	4
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 — 11 Credits

COMM1050	Communication in the Workplace	2
METS1000	Computers in Manufacturing	3
MATH1011	Beginning Algebra	3
MATH1031	Intermediate Algebra	3

Technical Studies Elective — 5 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

Manufacturing and
Engineering Technology
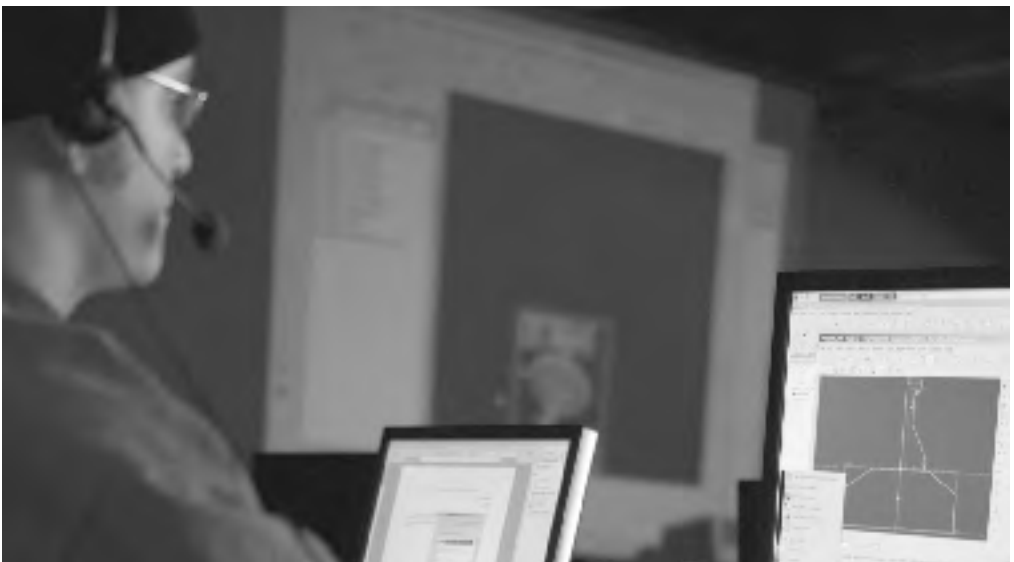
ENGINEERING CAD TECHNOLOGY

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

ENGL2121	Writing and Research	4
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

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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   8 Credits

COMM1050	Communication in the Workplace	2
MATH1011	Beginning Algebra	3
METS1000	Computers in Manufacturing	3

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
MACH1205	Machine Tool Technology	3
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 but are difficult to obtain. 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**

Manufacturing and
Engineering Technology

FLUID POWER ENGINEERING TECHNOLOGY

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

Overview

The Fluid Power Engineering Technician 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 technology (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
ENGL2121	Writing and Research	4
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**

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

Associate in Applied Science Degree
Hydraulic Engineering Technician (BP/EP)

Overview
The Hydraulic Engineering Technician A.A.S. degree program prepares individuals to perform high level research and design work utilized in the fluid power industry. Emphasis is placed on hydraulic system design, test and evaluation, problem-solving, business communications, system integration, computer-aided circuit construction and programmable logic controls. Hydraulic Engineering Technicians design, modify and specify motion controls for today's high-speed production equipment. The program will focus on improving hydraulic system efficiency through the integration of technology (hydraulics, 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. Hydraulic Engineering 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, hydraulic engineering, inside and outside sales consultant and product development.

Technical Studies Required   **53 Credits**

FLPW1101	Fluid Power Technology I	3
FLPW1106	Fluid Power Technology II	4
FLPW1181	Pumps, Actuators, and Conductors	4
FLPW1191	Hydraulic Components	3
FLPW1231	Industrial Electricity I	3
FLPW1236	Industrial Electricity II	3
FLPW1320	Hydraulic Circuits	2
FLPW2000	Programmable Logic Controllers	3
FLPW2020	Advanced Programmable Logic Controllers	3
or		
FLPW2180	Circuit Design	3
FLPW2112	Instrumentation of Fluid Power Systems (Industrial or Automated Machines)	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

ENGL2121	Writing and Research	4
	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   1 Credit

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

Total Associate in Applied Science Degree   72 Credits

Associate in Applied Science Degree
Pneumatic Engineering Technician (BP/EP)

Overview

The Pneumatic Engineering Technician A.A.S. degree program prepares individuals to perform high level research and design work utilized in the fluid power industry. Emphasis is placed on pneumatic system design, test and evaluation, problem-solving, business communications, system integration, computer-aided circuit construction and programmable logic controls. Pneumatic Engineering Technicians design, modify and specify motion controls for today's high-speed production equipment. The program will focus on improving pneumatic system efficiency through the integration of technology (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. Pneumatic Engineering Technicians will find employment with industries in automation, material handling and processing, robotics, 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, pneumatic engineering, inside and outside sales consultant and product development.

Technical Studies Required   45 Credits

FLPW1101	Fluid Power Technology I	3
FLPW1106	Fluid Power Technology II	4
FLPW1150	Pneumatic Components	4
FLPW1231	Industrial Electricity I	3
FLPW1236	Industrial Electricity II	3
FLPW1340	Pneumatic Circuits and Air Logic	4
FLPW2000	Programmable Logic Controllers	3
FLPW2020	Advanced Programmable Logic Controllers	3
FLPW2112	Instrumentation of Fluid Power Systems (Industrial or Automated Machines)	3
FLPW2321	System Engineering Portfolio	3
FLPW2360	Pneumatic Specialist Certification Review	2
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

ENGL2121	Writing and Research	4
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   9 Credits

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

Total Associate in Applied Science Degree   72 Credits

Diploma
Fluid Power Engineering Technician (BP/EP)

Overview

Fluid Power Engineering 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.

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		8 Credits
METS1000	Computers in Manufacturing	3
COMM1050	Communication in the Workplace	2
MATH1011	Beginning Algebra	3

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** |

Manufacturing and Engineering Technology

Diploma
Hydraulic Engineering Technician (BP/EP)

Overview
Hydraulic Engineering Technicians are responsible for building and modifying hydraulic systems utilized in the fluid power industry. Hydraulic Technicians calculate hydraulic system parameters, design circuits, evaluate operating systems and recommend changes for maximum efficiency. This program will focus on hydraulic component repair and testing, industrial electricity, programmable logic controls, circuit design and system engineering 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. Hydraulic Engineering Technicians must be able to read various fluid power schematics, determine adjustments to improve system efficiency and recommend circuit changes. Hydraulic Engineering Technicians test hydraulic components and systems, document changes and build new systems.

Career Opportunities
Hydraulic Engineering 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		55 Credits
FLPW1101	Fluid Power Technology I	3
FLPW1106	Fluid Power Technology II	4
FLPW1181	Pumps, Actuators, and Conductors	4
FLPW1191	Hydraulic Components	3
FLPW1231	Industrial Electricity I	3
FLPW1236	Industrial Electricity II	3
FLPW1320	Hydraulic Circuits	2
FLPW2000	Programmable Logic Controllers	3
FLPW2020	Advanced Programmable Logic Controllers	3
or		
FLPW2180	Circuit Design	3
FLPW2112	Instrumentation of Fluid Power Systems (Industrial or Automated Machines)	3
FLPW2191	Industrial Circuit Design	3
FLPW2250	Proportional and Servo Controls (Robotics Application)	3
FLPW2301	Mobile Circuit Design	3
FLPW2321	System Engineering Portfolio	3
FLPW2350	Hydraulic Specialist Certification Review	2
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		8 Credits
METS1000	Computers in Manufacturing	3
COMM1050	Communication in the Workplace	2
MATH1011	Beginning Algebra	3

Technical Studies Elective	1 Credit

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

Total Diploma	64 Credits

Manufacturing and Engineering Technology

Diploma
Pneumatic Engineering Technician (BP/EP)

Overview
Pneumatic Engineering Technicians are responsible for building and modifying pneumatic systems utilized in the fluid power industry. Pneumatic Engineering Technicians calculate pneumatic system parameters, design circuits, evaluate operating systems and recommend changes for maximum efficiency. This program will focus on pneumatic component repair and testing, industrial electricity, programmable logic controls, circuit design and system engineering 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. Pneumatic Engineering Technicians must be able to read various fluid power schematics, determine adjustments to improve system efficiency and recommend circuit changes. Pneumatic Engineering Technicians test pneumatic components and systems, document changes and build new systems.

Career Opportunities
Pneumatic Engineering 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		45 Credits
FLPW1101	Fluid Power Technology I	3
FLPW1106	Fluid Power Technology II	4
FLPW1150	Pneumatic Components	4
FLPW1231	Industrial Electricity I	3
FLPW1236	Industrial Electricity II	3
FLPW1340	Pneumatic Circuits and Air Logic	4
FLPW2000	Programmable Logic Controllers	3
FLPW2020	Advanced Programmable Logic Controllers	3
FLPW2112	Instrumentation of Fluid Power Systems (Industrial or Automated Machines)	3
FLPW2321	System Engineering Portfolio	3
FLPW2360	Pneumatic Specialist Certification Review	2
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		8 Credits
METS1000	Computers in Manufacturing	3
COMM1050	Communication in the Workplace	2
MATH1011	Beginning Algebra	3

Technical Studies Elective	11 Credits

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

Total Diploma	64 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 and service and manufacturing (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 or	Pneumatic Components	4
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** |

Advanced Technical Certificate
National Certified Fluid Power Specialist (BP/EP)

Overview

This certificate is designed for students who desire national certification as a Fluid Power Specialist.

Prerequisite: Graduation from the Hydraulic Engineering Technician and Pneumatic Engineering Technician diploma or A.A.S. degree programs.

Career Opportunities

Students with this certification are recognized in the industry as possessing the knowledge and skills necessary to perform as an engineering technician in the fluid power industry.

Technical Studies Required		**10 Credits**
FLPW2191	Industrial Circuit Design.	3
FLPW2321	System Engineering Portfolio	3
FLPW2350	Hydraulic Specialist Certification Review.	2
FLPW2360	Pneumatic Specialist Certification Review.	2
FLPW2450	Hydraulic Specialist Certification Exam	0
FLPW2460	Pneumatic Specialist Certification Exam	0
Total Advanced Technical Certificate		**10 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, troubleshooting 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

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, 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**

Manufacturing and
Engineering Technology

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

Course	Title	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

Course	Title	Credits
ENGL2121	Writing and Research	4
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

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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

ENGL2121	Writing and Research. 4
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		8 Credits
MATH1000	Prealgebra	2
MATH1011	Beginning Algebra	3
METS1000	Computers in Manufacturing	3

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		8 Credits
MATH1000	Prealgebra	2
MATH1011	Beginning Algebra	3
METS1000	Computers in Manufacturing	3

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.

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
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 of 2 years 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.

Manufacturing and Engineering Technology

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, plastic technology or welding. 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
PLST2007	Properties and Tests of Selected Plastics	4

Select at least 12 credits from the following:

PLST2011	Extrusion Molding Processes I	3
PLST2017	Extrusion Molding Processes II	4
PLST2128	Injection Molding Process I	4
PLST2138	Injection Molding Process II	4
PLST2143	Injection Molding Process III	4
PLST2300	Plastics Manufacturing Technology Internship	4

Welding and Metal Fabrication Specialization

WLDG1135	Gas Metal Arc Welding I	3
WLDG1181	Blueprint Reading for Welders	3
WLDG1220	Gas Tungsten Arc Welding I	3
WLDG1350	Flux Cored Arc Welding I	3

Select at least 9 additional WLDG credits

General Education Required   12 Credits

ENGL2121	Writing and Research	4
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

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		25 Credits
METS1030	Quality Assurance/Statistical Process Control	3
PLST1008	Fundamentals of Plastics/Chemistry and Ingredients	4
PLST1041	Introduction to Plastics Molding Processes	3
PLST2007	Properties and Tests of Selected Plastics	4
PLST2300	Plastics Manufacturing Technology Internship	4

Select from 12 credits of Injection Molding or 7 credits of Extrusion Molding

PLST2128	Injection Molding Process I	4
PLST2138	Injection Molding Process II	4
PLST2143	Injection Molding Process III	4
or		
PLST2011	Extrusion Molding Processes I	3
PLST2017	Extrusion Molding Processes II	4

General Education Required		5 Credits
COMM1050	Communication in the Workplace	2
METS1000	Computers in Manufacturing	3

Technical Studies Elective		6 Credits

Any APKG, ELEC, ENGC, FLPW, MACH, 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		14 Credits
PLST2007	Properties and Tests of Selected Plastics	4
PLST2011	Extrusion Molding Processes I	3
PLST2017	Extrusion Molding Processes II	4
METS1030	Quality Assurance/Statistical Process Control	3
	Total Occupational Certificate	**14 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		19 Credits
PLST2007	Properties and Tests of Selected Plastics	4
PLST2128	Injection Molding Process I	4
PLST2138	Injection Molding Process II	4
PLST2143	Injection Molding Process III	4
METS1030	Quality Assurance/Statistical Process Control	3
	Total Occupational Certificate	**19 Credits**

Manufacturing and Engineering Technology

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	**Credits 54**

Manufacturing and Engineering Technology

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, aero space, 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**

Manufacturing and Engineering Technology

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 Production			
Associate in Applied Science Degree	Audio Production Specialist (EP)	72 Credits	Page 146
Diploma	Audio Production Specialist (EP)	64 Credits	Page 147
Graphic Design			
Associate in Applied Science Degree	Graphic Design - Creative Emphasis (BP)	72 Credits	Page 148
Associate in Applied Science Degree	Graphic Design - Web Design Emphasis (BP)	72 Credits	Page 149
Associate in Applied Science Degree	Graphic Design - Printing Industry Emphasis (BP)	72 Credits	Page 151
Diploma	Graphic Design - Creative Emphasis (BP)	64 Credits	Page 152
Diploma	Graphic Design - Web Design Emphasis (BP)	64 Credits	Page 153
Diploma	Graphic Design - Production Emphasis (BP)	54 Credits	Page 154
Occupational Certificate	Digital Production (BP)	22 Credits	Page 155
Occupational Certificate	Production Technician for Digital Publishing (BP)	28 Credits	Page 156
Occupational Certificate	Basic Web Technologies(BP)	17 Credits	Page 156
MultiMedia/Video Design and Production			
Associate in Applied Science Degree	Multimedia Designer (BP)	72 Credits	Page 158
Associate in Applied Science Degree	Video Production Specialist (BP)	72 Credits	Page 159
Diploma	Video Production Specialist (BP)	64 Credits	Page 160
Diploma	Multimedia Designer (BP)	64 Credits	Page 161
Occupational Certificate	Audio/Visual Specialist (BP)	26 Credits	Page 162
Printing & Prepress Technology			
Associate in Applied Science Degree	Printing and Prepress Technology (BP)	72 Credits	Page 163
Diploma	Printing and Prepress Technology (BP)	64 Credits	Page 164
Occupational Certificate	Printing Technician (BP)	30 Credits	Page 165
Occupational Certificate	Printing/Bindery/Finishing Operator (BP)	15 Credits	Page 166
Professional Photography			
Associate in Applied Science Degree	Professional Photography Technology (EP)	66 Credits	Page 167
Diploma	Commercial Photography (EP)	60 Credits	Page 168
Diploma	Portrait and Wedding Photography (EP)	60 Credits	Page 169

Media Communications Careers

Media Communication Careers

AUDIO PRODUCTION

Associate in Applied Science Degree
Audio Production 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

ENGL2121	Writing and Research	4
or		
ENGL2125	Technical Writing	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 Production 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
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		52 Credits
MGDP1220	Concepts in Creativity	3
MGDP1230	Photoshop	3
MPRT1210	Color Applications	3
MADV1010	Basic Drawing	3
MADV2020	Collateral Advertising	3
MADV2030	Packaging and Display Advertising	3

MGDP1205	Fundamentals of Graphic Design	3
MGDP1225	QuarkXpress	3
MGDP1235	Fundamentals of Digital Imaging	2
MGDP1240	Illustrator	3
MGDP1300	Digital Design Essentials	3
MGDP1310	InDesign	3
MGDP1330	Advanced Page Layout	3
MGDP1360	Acrobat	2
MGDP2010	Applied Graphic Design	3
MGDP2020	Print Media Production	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
ENGL2121	Writing and Research	4
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.

Technical Studies Elective   2 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 Associate in Applied Science Degree   72 Credits

Associate in Applied Science Degree
Graphic Design - Web Design Emphasis (BP)

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
MMVP1500	Concepts of Multimedia	3
MPRT1210	Color Applications	3
CCIS1351	Advanced XHTML	4
MGDP1205	Fundamentals of Graphic Design	3
MGDP1240	Illustrator	3
MGDP1265	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
ENGL2121	Writing and Research	4
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.

Technical Studies Elective	13 Credits

Any CCIS, 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**

Associate in Applied Science Degree
Graphic Design: Printing Industry Emphasis (BP)

Overview

The explosive growth of the printing industry has created a demand for highly skilled creative individuals. The unique talents of designers able to prepare work for printing are very much in demand. Graphic designers in the printing industry skillfully utilize their creative technology to transform an idea or concept. The transformation procedure is an integral part of the print or digital media production process. Artwork must be prepared for the printing processes before it can be reproduced. Pictures must be scanned, color corrected and images enhanced or manipulated. Pages of copy must be designed and prepared on the computer and then output, ready for press. 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. 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!

Career Opportunities

Unlimited. Qualifies students to work in newly created positions of Design/Prepress in the printing industry. Printing is Minnesota's 2nd largest industry.

Technical Studies Required   52 Credits

MGDP1220	Concepts in Creativity	3
MGDP1230	Photoshop	3
MMVP1500	Concepts of Multimedia	3
MGDP1205	Fundamentals of Graphic Design	3
MGDP1225	QuarkXpress	3
MGDP1235	Fundamentals of Digital Imaging	2
MGDP1240	Illustrator	3
MGDP1300	Digital Design Essentials	3
MGDP1310	InDesign	3
MGDP1360	Acrobat	2
MGDP2020	Print Media Production	3
MPRT1200	Fundamentals of Printing	3
MPRT1210	Color Applications	3
MPRT1219	Prepress Essentials	3
MPRT1245	Offset Press Operations I	3
MPRT1250	Bindery/Finishing Operations	3
MPRT1361	Computer Imposition	3
MPRT2212	Professional Scanning	3

General Education Required   18 Credits

PHIL2100	Critical Thinking	3

Choose 15 credits from the following:

COMM2050	Interpersonal Communication	3
COMM2060	Small Group Communication	3
COMM2130	Public Speaking	3
ENGL2121	Writing and Research	4
ENGL2125	Technical Writing	3
PHIL2200	Ethics	3

Media Communications Careers

Technical Studies Elective   **2 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   **55 Credits**

MGDP1220	Concepts in Creativity	3
MGDP1230	Photoshop	3
MMVP1500	Concepts of Multimedia	3
MPRT1210	Color Applications	3
MADV1010	Basic Drawing	3
MADV2020	Collateral Advertising	3
MADV2030	Packaging and Display Advertising	3
MGDP1205	Fundamentals of Graphic Design	3
MGDP1225	QuarkXpress	3
MGDP1235	Fundamentals of Digital Imaging	2
MGDP1240	Illustrator	3
MGDP1300	Digital Design Essentials	3
MGDP1310	InDesign	3

MGDP1330	Advanced Page Layout	3
MGDP1360	Acrobat	2
MGDP2010	Applied Graphic Design	3
MGDP2020	Print Media Production	3
MGDP2200	Design Portfolio	3
MPRT1200	Fundamentals of Printing	3

General Education Required   9 Credits

COMM2060	Small Group Communication	3
or		
COMM2130	Public Speaking	3
ENGL1026	Essentials of Technical Writing	3
PHIL2100	Critical Thinking	3

Total Diploma   **64 Credits**

Diploma
Graphic Design - Web Design Emphasis (BP)

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
MMVP1500	Concepts of Multimedia	3
MPRT1210	Color Applications	3
CCIS1351	Advanced XHTML	4
MGDP1205	Fundamentals of Graphic Design	3
MGDP1240	Illustrator	3
MGDP1265	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		**9 Credits**
COMM2060	Small Group Communication	3
or		
COMM2130	Public Speaking	3
ENGL1026	Essentials of Technical Writing	3
PHIL2100	Critical Thinking	3

Technical Studies Elective		**14 Credits**

Any CCIS, 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)

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		**43 Credits**
MGDP1220	Concepts in Creativity	3
MGDP1230	Photoshop	3
MMVP1500	Concepts of Multimedia	3
MPRT1210	Color Applications	3
MGDP1205	Fundamentals of Graphic Design	3
MGDP1225	QuarkXpress	3
MGDP1235	Fundamentals of Digital Imaging	2
MGDP1240	Illustrator	3
MGDP1265	XHTML	3
MGDP1300	Digital Design Essentials	3
MGDP1310	InDesign	3
MGDP1330	Advanced Page Layout	3

MGDP1360   Acrobat 2
MGDP2020   Print Media 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
ENGL1026   Essentials of Technical Writing 3
ENGL2121   Writing and Research 4
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	54 Credits

Occupational Certificate
Digital Production (BP)

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	22 Credits

MGDP1205   Fundamentals of Graphic Design 3
MGDP1225   QuarkXpress 3
MGDP1230   Photoshop 3
MGDP1235   Fundamentals of Digital Imaging 2
MGDP1240   Illustrator 3
MGDP1310   InDesign 3
MGDP1360   Acrobat 2
MPRT1200   Fundamentals of Printing 3

Total Occupational Certificate	22 Credits

Occupational Certificate
Production Technician for Digital Publishing (BP)

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	3
MGDP1230	Photoshop	3
MGDP1235	Fundamentals of Digital Imaging	2
MGDP1240	Illustrator	3
MGDP1300	Digital Design Essentials	3
MGDP1310	InDesign	3
MGDP1330	Advanced Page Layout	3
MGDP1360	Acrobat	2
MGDP2020	Print Media Production	3
Total Occupational Certificate		**28 Credits**

Occupational Certificate
Basic Web Technologies (BP)

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	XHTML	3
or		
MGDP1265	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

Great Expectations

Mike Kretsinger, co-founder of Atomic Playpen and HTC graduate.

Seeing an opportunity and making the most of it. That's the thread that runs through Mike Kretsinger's career, from his choice to attend Hennepin Technical College while still in high school to owning two companies devoted to helping organizations establish a memorable brand presence – both online and offline. In between, he honed his skills in advertising and capitalized on opportunities to learn as much as he could about emerging technology. All that paid off: Kretsinger is co-founder and principal of M.J. Kretsinger, a full-service advertising and marketing communications company, and Atomic Playpen, an online strategy and development firm, both based in Minneapolis. But he still appreciates the start he got at HTC.

As a high school student interested in art, Kretsinger found that by the time he was a sophomore he had completed most of the art classes offered at his high school in St. Louis Park, Minnesota So when he learned that there was an opportunity to advance his studies in his junior year by attending classes at HTC in Brooklyn Park, he was ready to see where it might lead.

"I really loved it," says Kretsinger of his first taste of what was then the Commercial Art program. "I got hands-on experience that I needed to start my career." After graduating from HTC in 1987, Kretsinger's first job was with Minnesota Suburban newspapers, initially as a keyliner and then working in the Advertising department. With the advent of computers in the industry, the newspaper group was one of the first in the state to add Macintosh computers. Kretsinger benefited from the company-paid training that launched him into the computer age. He went on to work as a production artist at The Zimmerman Group in Edina; after three years, he became assistant art director at Webber Advertising in Eden Prairie, and then art director at WatersMolitor, an advertising and promotion firm in Minnetonka.

In 1996, Kretsinger launched a freelance career, then three years later met his business partner, Troy Venjohn, and decided that with the growth of the Internet, the time was right to focus on designing websites that provide clients with a professional online presence. They were paid $5,000 for the first site they designed and they've been busy and growing ever since. Together, the sister companies M.J. Kretsinger and Atomic Playpen have over 30 employees and a client list that includes Target, TCF Bank, Polaris, Aramark and the Minnesota Vikings.

M.J. Kretsinger Advertising is recognized as being in the top 20 advertising agencies in the state and Atomic Playpen is in the top 10, based on revenue. Over the past two years, the agencies have won over 25 local and national awards for their work, including recognition in the Communication Arts Magazine's Interactive Design Annual 10.

As an employer, Kretsinger says, "I look for a portfolio that shows hands-on experience, and that's the advantage HTC graduates have in the marketplace. The college helps you position yourself to sell yourself and make the most of your talents, but you need to have the passion to do it."

Nearly two decades after graduating, Kretsinger has found an opportunity to help others find out what HTC offers: Atomic Playpen is in the process of redesigning the HTC website. Now that his alma mater is also a client, it's Mike Kretsinger's turn to take a look back, even as he keeps his eye on the future.

To learn more, visit www.atomicplaypen.com and www.mjkretsinger.com.

Media Communications Careers

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		19 Credits
COMM2050	Interpersonal Communication	3
COMM2130	Public Speaking	3
ENGL2121	Writing and Research	4
ENGL2125	Technical Writing	3
or		
COMM2060	Small Group Communication	3
PHIL2100	Critical Thinking	3
PHIL2200	Ethics	3

Technical Studies Elective   **2 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   **19 Credits**

COMM2050	Interpersonal Communication	3
COMM2130	Public Speaking	3
ENGL2121	Writing and Research	4
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
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	Team Building in the Workplace	2
COMM1040	Job Seeking Skills	2
COMM2130	Public Speaking	3
ENGL1026	Essentials of Technical Writing	3
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   Team Building in the Workplace..2
COMM1040   Job Seeking Skills..2
COMM2130   Public Speaking..3
ENGL1026   Essentials of Technical Writing..3
  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   Team Building 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   52 Credits

CCIS1505	Fundamentals of Programming	4
MGDP1220	Concepts in Creativity	3
MGDP1225	QuarkXpress	3
MGDP1230	Photoshop	3
MGDP1240	Illustrator	3
MMVP1515	Digital Media Technology	3
MPRT1200	Fundamentals of Printing	3
MPRT1210	Color Applications	3
MPRT1219	Prepress Essentials	3
MPRT1245	Offset Press Operations I	3
MPRT1250	Bindery/Finishing Operations	3
MPRT1345	Offset Press Operations II	3
MPRT1361	Computer Imposition	3
MPRT1380	Variable Data Printing	3
MPRT1385	Variable Data Printing Programming Essentials	3
MPRT2212	Professional Scanning	3
MPRT2220	Digital Press Operations	3

General Education Required   12 Credits

COMM2060	Small Group Communication	3
ENGL2121 or	Writing and Research	4
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.

Technical Studies Elective   **2 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   **49 Credits**

CCIS1505	Fundamentals of Programming	4
MGDP1220	Concepts in Creativity	3
MGDP1225	QuarkXpress	3
MGDP1230	Photoshop	3
MGDP1240	Illustrator	3
MMVP1515	Digital Media Technology	3
MPRT1200	Fundamentals of Printing	3
MPRT1210	Color Applications	3
MPRT1219	Prepress Essentials	3
MPRT1245	Offset Press Operations I	3
MPRT1250	Bindery/Finishing Operations	3
MPRT1345	Offset Press Operations II	3
MPRT1361	Computer Imposition	3
MPRT1380	Variable Data Printing	3
MPRT1385	Variable Data Printing Programming Essentials	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   **3 Credits**

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

Technical Studies Elective   **3 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
Printing 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 crucial 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
MPRT1219	Prepress Essentials	3
MPRT1245	Offset Press Operations I	3
MPRT1250	Bindery/Finishing Operations	3
MPRT1345	Offset Press Operations II	3
MPRT1325	Printing Machinery Maintenance	3
or		
MPRT2250	Advanced Bindery/Finishing Operations	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
Printing/Bindery/Finishing 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 Printing/Bindery/Finishing Operator Certificate provides the training needed to work in today's modern print shop. Course work includes hands-on training using modern 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
MPRT1345	Offset Press Operations II	3
MPRT1210 or	Color Applications	3
MPRT1325 or	Printing Machinery Maintenance	3
MPRT2250	Advanced Bindery/Finishing Operations	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		48 Credits
PRPO1010	Introduction to 35mm Camera Operations	3
PRPO1030	Black and White Photography	3
PRPO1051	Ambient Lighting Controls	3
PRPO1070	Photographic Design	3
PRPO1170	Photographer's Assistant	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
PRPO2100	Advanced 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	Professional Photography Portfolio	3
MATH1000	Prealgebra	2

General Education Required		9 Credits
COMM2050	Interpersonal Communication	3
ENGL2125	Technical Writing	3
PHIL2100	Critical Thinking	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.

Total Associate in Applied Science Degree   66 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   49 Credits

PRPO1010	Introduction to 35mm Camera Operations	3
PRPO1030	Black and White Photography	3
PRPO1051	Ambient Lighting Controls	3
PRPO1070	Photographic Design	3
PRPO1170	Photographer's Assistant	3
PRPO1200	Studio Lighting	3
PRPO1260	Medium Format Photography	3
PRPO1280	Large Format Photography	3
PRPO1400	Digital Darkroom	3
PRPO2100	Advanced 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
PRPO2580	Professional Photography Internship I	2
PRPO2820	Professional Photography Portfolio	3

General Education Required   2 Credits

MATH1000	Prealgebra	2

General Education Elective   6 Credits

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

Technical Studies Elective   **3 Credits**

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

> **Total Diploma**   **60 Credits**

Diploma
Portrait and Wedding Photography (EP)

<u>Overview</u>

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.

<u>Career Opportunities</u>

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   **46 Credits**

PRPO1010	Introduction to 35mm Camera Operations	3
PRPO1030	Black and White Photography	3
PRPO1051	Ambient Lighting Controls	3
PRPO1070	Photographic Design	3
PRPO1170	Photographer's Assistant	3
PRPO1240	Beginning Portraiture	3
PRPO1260	Medium Format Photography	3
PRPO1400	Digital Darkroom	3
PRPO2100	Advanced 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
PRPO2820	Professional Photography Portfolio	3

General Education Required   **2 Credits**

MATH1000	Prealgebra	2

General Education Elective   **6 Credits**

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

Technical Studies Elective   **6 Credits**

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

> **Total Diploma**   **60 Credits**

**Media Communications
Careers**

Public Safety and Service Careers

Child Development Careers			
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Culinary Arts			
Associate in Applied Science Degree	Culinary Arts (BP/EP)	66 Credits	Page 173
Diploma	Culinary Arts (BP/EP)	52 Credits	Page 174
Occupational Certificate	Culinary Assistant (BP/EP)	16 Credits	Page 176
Emergency Management			
Advanced Technical Certificate	Emergency Management (EP)	20 Credits	Page 177
Environmental Health and Safety			
Occupational Certificate	Hazardous Materials Technology (EP)	20 Credits	Page 177
Fire Protection			
Associate in Applied Science Degree	Fire Science Technology (EP)	72 Credits	Page 178
Diploma	Fire Protection Technician (EP)	48 Credits	Page 179
Advanced Technical Certificate	Company Officer (EP)	13 Credits	Page 180
Occupational Certificate	Fire Suppression Technician (EP)	24 Credits	Page 181
Occupational Certificate	Fire Inspection/Investigation (EP)	10 Credits	Page 181
Occupational Certificate	Hazardous Materials (EP)	15 Credits	Page 182

Public Safety and 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 the degree of the employees at the teacher level.

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
SSCI2100	Introduction to Sociology	3
SSCI2300	General Psychology	3

Choose one of the following:

ENGL2121	Writing and Research	4
ENGL2125	Technical Writing	3
ENGL2130	Introduction to Creative Writing	3
MATH2100	Concepts in Mathematics	3
MATH2200	College Algebra	4
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.

Technical Studies Elective   5 Credits

CHLD1900	Specialized Lab	1-4
CHLD2050	Supporting Children's Play	2
CHLD2126	Caring for Infants and Toddlers	3
CHLD2140	Curriculum for Infants and Toddlers	2
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
CHLD2530	Advanced Guidance Methods	2
LANG1000	American Sign Language, Deaf Culture I	3
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   27 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
CHLD2100	Child Abuse and Neglect	2

General Education Elective   4 Credits

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

         Total Diploma   **33 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 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 are some of the many career positions possible upon course completion. Students who complete the Culinary Arts 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 are some of the many career positions possible
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

Public Safety and
Service Careers

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 foodservice industry. Areas of study will include, but are not limited to: foodservice 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 (EP)

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.

Prerequisite: This certificate is designed for persons who have experience in the public safety field or are currently employed in the industry. For example: Law Enforcement, Fire Service, Emergency Medical Services or Emergency Management Services.

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 (EP)

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	**20 Credits**

FIRE PROTECTION

Associate in Applied Science Degree
Fire Science Technology (EP)

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.

Student must be at least 18 years of age and complete a physical exam including a spirometry test (lung capacity).

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 the Fire Service	3
FRPT1165	Apparatus Operator	3
FRPT1175	Hazardous Materials First Responder Operational	3
FRPT1180	Hazardous Materials Technician	3
FRPT2135	Fire Department Administration Advanced	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
ENGL2121	Writing and Research	4
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 (EP)

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.

Student must be at least 18 years of age and complete a physical exam including a spirometry test (lung capacity).

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

Public Safety and Service Careers

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 (EP)

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 meet the requirements of NFPA 1021.

Prerequisite: Graduate of the Fire Suppression Certificate or equivalent.

Career Opportunities

Firefighters 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 (EP)

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 (EP)

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 firefighters, 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 (EP)

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**

Transportation Careers

Auto Body Collision Technology			
Associate in Applied Science Degree	Auto Body Technician (BP/EP)	72 Credits	Page 184
Diploma	Auto Body Technician (BP/EP)	64 Credits	Page 185
Advanced Technical Certificate	Structural Repair Technician Assistant (BP/EP)	16 Credits	Page 186
Occupational Certificate	Non-Structural Repair Technician Assistant (BP/EP)	16 Credits	Page 186
Occupational Certificate	Refinishing Technician Assistant (BP/EP)	17 Credits	Page 187
Occupational Certificate	Custom Fabrication and Finishing (BP/EP)	19 Credits	Page 187
Occupational Certificate	Auto Body Estimator (BP)	9 Credits	Page 188
Automotive Mechanics Technology			
Associate in Applied Science Degree	Automotive Technician (BP/EP)	72 Credits	Page 188
Diploma	Automotive Technician (BP/EP)	64 Credits	Page 190
Ford Automotive Student Service Educational Training Program (ASSET)			
Associate in Applied Science Degree	Automotive Technology (Ford ASSET) (BP)	96 Credits	Page 191
Marine/Motor Sports Technology			
Associate in Applied Science Degree	Marine/Motor Sports Technician (EP)	72 Credits	Page 192
Diploma	Marine/Motor Sports Technician (EP)	64 Credits	Page 193
Occupational Certificate	Motorcycle Technician (EP)	30 Credits	Page 194
Occupational Certificate	Outboard Marine Technician (EP)	30 Credits	Page 195
Occupational Certificate	Power Equipment Certificate (EP)	30 Credits	Page 195
Medium/Heavy Truck Technology			
Associate in Applied Science Degree	Medium/Heavy Truck Technology (BP)	94 Credits	Page 196
Diploma	Medium/Heavy Truck Maintenance Technician (BP)	44 Credits	Page 197
Diploma	Medium/Heavy Truck Drivetrain Technician (BP)	39 Credits	Page 198

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

Course	Title	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

Course	Title	Credits
COMM2060	Small Group Communication	3
ENGL2121	Writing and Research	4
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   15 Credits

	*Choose one course from MnTC Goal Area 5	3
	*Choose one course from MnTC Goal Area 7	3
CPLT1100	Introduction to Personal Computers	3
ENGL2121	Writing and Research	4
or		
ENGL2125	Technical Writing	3
PHIL2100	Critical Thinking	3
or		
PHIL2200	Ethics	3

*The same course cannot satisfy more than one MnTC Goal Area requirement.

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   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	Engine Repair	3
FDAS1550	Engine Operation	2
FDAS1600	Ford Suspension and Alignment	2
FDAS1611	Noise Vibration Harshness (NVH)	3
FDAS1650	Ford Steering and Balance	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
FDAS2502	Ford Advanced Engine Performance	3
FDAS2551	Ford DI Diesel	3
FDAS2600	Ford Braking Systems	3

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

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MARINE/MOTOR SPORTS TECHNOLOGY

Associate in Applied Science Degree
Marine/Motor Sports Technician (EP)

Overview
The Marine/Motors Sports Technology degree prepares the student in all areas of the Marine, Motor Sports and Power Equipment repair and service. A marine/motor sports technician will diagnose, evaluate, estimate repair costs and repair various types of marine, motorcycle and power equipment.

Career Opportunities
The Marine/Motor Sports Technology Associate Associate in Applied Science degree will allow the graduate the opportunities to advance to careers in the major manufacturer's research and development departments. Service or sales representative positions would be available to a person holding an A.A.S. also. Another possible opportunity would be for a promotion to a supervisory position.

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		9 Credits
COMM2050	Interpersonal Communication	3
ENGL2121	Writing and Research	4
or		
ENGL2125	Technical Writing	3
PHIL2100	Critical Thinking	3
or		
PHIL2200	Ethics	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   **9 Credits**

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

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

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

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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 Marine 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	Introduction to Diesel Engines	3
MHTT1321	Heating and Air Conditioning	3
MHTT1330	Internship/Industry Partnership III	5
MHTT1401	Diesel Engine II	3
MHTT1410	Transmission Technologies	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   Introduction 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	Transmission Technologies	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)

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)   **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) **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) **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **2 cr**

ABCT2040   RESTRAINT SYSTEMS

This course will teach theory and practical applications of automotive restraint systems along with diagnosis and service. (Prereq: None)   **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)   **3 cr**

ABCT2055   PANEL REPLACEMENT AND RESTORING CORROSION PROTECTION

The technicians understanding of 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)   **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)   **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)   **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)   **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)   **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)   **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)   **1 cr**

ABCT2150   BRAKE SYSTEMS

This course is designed to apply knowledge of brake system operation and performance problems. (Prereq: None)   **1 cr**

ABCT2165   DRIVETRAINS

Theory and practical application of drivetrain components and their assemblies will be covered in this course. (Prereq: None)   **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) **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) **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) **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) **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) **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) **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) **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) **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) **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) **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) **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) **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) **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) **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) **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) **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) **4 cr**

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) **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) **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) **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) **1-10 cr**

ACCT2850   CERTIFIED BOOKKEEPER EXAM REVIEW
This course is designed to prepare students to successfully pass the Certified Bookkeeper Examination. This national examination provides proof of your skills and knowledge to carryout all key accounting functions. Becoming a Certified Bookkeeper, can increase students earning potential, professional standing and provide an edge in a competitive job market. (Prereq: ACCT1000) **5 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)   **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)   **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)   **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)   **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 set-up. Also included are scales, weighing, checkweighers, package design and testing. (Prereq: None)   **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 set-up, troubleshooting and repair of labeling, bar coding, conveying, accumulating and palleting equipment. (Prereq: None)   **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)   **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)   **3 cr**

APKG1200   INTRODUCTION TO ROBOTICS

This course is designed to allow students to program, setup 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)   **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) **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 setup and troubleshooting of various hydraulic and pneumatic components and functions used on automated machines.   (Prereq: None)   **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)   **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)   **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)   **4 cr**

**ARCH1001   INTRODUCTION TO
                ARCHITECTURAL DRAFTING**

This course will introduce the student to the Architectural Drafting profession. Topics covered include architectural drawing standard, dimensioning practices, drawing set components and terminology. These topics will be applied to the creation of construction drawings for a single story residence. (Prereq: None) **2 cr**

ARCH1006   ARCHITECTURAL DRAFTING I

This course will continue to explore the process of designing and drafting a residential structure based on design criteria and applicable codes while reinforcing architectural drafting standards and conventions. The student will be introduced to the principles of stair design and kitchen and bath design while producing a set of construction drawings for a split-entry/split level home. (Prereq: ARCH1001 or equivalent and ARCH1202) **3 cr**

ARCH1011   ARCHITECTURAL DRAFTING II

This course will reinforce sound drafting and design processes, increase CAD proficiency, introduce intermediate CAD techniques and introduce the student to energy code requirements through the production of construction drawings for a residential and/or light commercial project. (Prereq: ARCH1006) **5 cr**

**ARCH1100   ARCHITECTURAL CAD: BASIC
                AUTOCAD**

This course will introduce the student to the basics needed to use the computer and AutoCAD software as a tool in the preparation of architectural working drawings. Topics to be covered include CAD terminology and coordinate systems, drawing set-up, drawing and modifying commands, annotation, dimensioning, hatching and plotting. Architectural drawing projects are included in this course. (Prereq: None)   **4 cr**

**ARCH1202   MATERIALS AND METHODS OF
                CONSTRUCTION I**

This course will familiarize the student with the materials and methods that are used in wood and light-gauge steel frame construction. Topics to be covered include foundations, floor systems, wall framing, ceiling/roof framing and interior and exterior finishes. (Prereq: None) **2 cr**

ARCH1206   STRENGTH OF MATERIALS

This course is designed to acquaint the student with principles of structural engineering as they apply to the architectural drafting profession. Topics to be covered include the basic principles of structural mechanics, including bending, shear and deflection, and their application to the design of wood, steel and concrete structural elements. (Prereq: None) **3 cr**

ARCH1225   TECHNICAL DRAWING

The student will demonstrate isometric and orthographic drawings. (Prereq: None)   **1 cr**

ARCH1230   SKETCHING

The student will demonstrate an ability to sketch in 2-D in both pencil and ink. (Prereq: None)   **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)   **1 cr**

ARCH1340   BUILDING CODES

This course will introduce the student to the organization, use and impact of the International Building Code in the design of buildings. (Prereq: None)   **2 cr**

ARCH1345   BUILDING SYSTEMS

This course will introduce the student to basic design and drafting requirements of HVAC, plumbing, electrical and low-voltage/data/communication systems in both residential and commercial applications. (Prereq: None)   **3 cr**

ARCH1480   ARCHITECTURAL PRACTICES AND PROCEDURES

This course is intended to increase the student's awareness of the construction industry and understanding of the different organizations and groups that are part of this industry. The course will provide an overview of the owner, developer, architect and contractor relationships and the responsibilities of each in the construction process. The student will study office organization, personnel relationships, project practices, construction phases, specifications and construction performance. (Prereq: None)   **3 cr**

ARCH2121   ARCHITECTURAL DRAFTING III

This course will continue to introduce advanced elements of AutoCAD and CAD drafting. The student will also be introduced to the use of load bearing masonry and structural steel framing systems in the context of a large-scale building project. (Prereq: ARCH1011)   **5 cr**

ARCH2141   ARCHITECTURAL DRAFTING IV

The goal of this course is the production of a set of construction drawings for a commercial building project where poured and pre-cast concrete are the primary structural building materials. The course utilizes a team approach to the project to foster the critical thinking, problem-solving and teamwork skills required in industry. Emphasis will also be given to increasing CAD proficiency through the use of advanced AutoCAD techniques and Internet-based communication applications. (Prereq: ARCH2121)   **5 cr**

ARCH2330   ARCHITECTURAL PRESENTATION

This 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) **3 cr**

ARCH2340   DESIGN DEVELOPMENT FOR ARCHITECTURAL DRAFTING

This course is intended to give the student experience in pre-construction drawing and drafting requirements. Based on a project of the students choice, the student will reproduce the development process and layout work required prior to the start of working drawings. This will include circulation diagrams and square footage studies as well as a study model of the project. (Prereq: ARCH1100)   **3 cr**

ARCH2351   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)   **4 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)   **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 approval) **4 cr**

ARCH2466   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 as well as how these should be represented graphically. Materials to be examined include steel, concrete, masonry, interior and exterior finishes and waterproofing. (Prereq: None)   **2 cr**

ARCH2561   ESTIMATING

This course is designed to introduce the student to the principles and procedures of estimating construction material quantities. Both ledger and/or computer-based systems will be utilized in arriving at an estimated cost for a building project. (Prereq: None)   **3 cr**

ARCH2640   ARCHITECTURAL HISTORY

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. (Prereq: None)   **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)   **3 cr**

ARCH2900   INTERNSHIP

This course allows the student to gain on-the-job experience in the AEC industry. The student is responsible for finding and setting up the internship position. Two (2) to four (4) credits can be taken, with each credit requiring 40 hours of time spent on the job. Student performance will be monitored by the instructor and evaluated by the employer. (Prereq: Instructor approval)   **2-4 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)   **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)   **3 cr**

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)   **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) **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)   **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)   **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)   **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)   **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)   **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)   **2 cr**

ARSP1350   MUSIC THEORY
This course covers fundamental concepts of rhythm, song structure, note values and the circle of fifths. (Prereq: None)   **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) **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) **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) **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) **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) **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) **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) **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) **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) **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) **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) **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) **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) **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) **2 cr**

ARSP2170   LIVE SOUND REINFORCEMENT I
This course covers the basic operational systems for live sound reinforcement, setup 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) **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) **3 cr**

**ARSP2325   DIGITAL AUDIO THEORY II
                   (DIGIDESIGN 201/210M)**
This course covers advanced applications of digital audio recording and editing, 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) **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) **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) **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) **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) **3 cr**

**ARSP2580   AUDIO RECORDING
                   INTERNSHIP I**
This is a cooperative program between the 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) **2 cr**

**ARSP2585   AUDIO RECORDING
                   INTERNSHIP II**
This is a cooperative program between the 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) **2 cr**

**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) **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) **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) **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) **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) **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) **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) **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **3 cr**

ATEC1630   EMISSION CONTROLS

In this course the student will learn the operation of emission control systems and their purpose and actual 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)   **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)   **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)   **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)   **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) **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)   **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)   **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)   **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) **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) **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) **3 cr**

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) **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) **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) **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, ATEC1300, ATEC1500, and completion of the first year courses or instructor approval) **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) **5 cr**

BUSN1000   INTRODUCTION TO BUSINESS
This is an college level introductory course in business practices. The course is an overview of the role of business in the American economy and the international community. The course will cover the free enterprise system used in America. The student will look at issues of business and society; as well as, legal, regulatory, and political responsibilities on the part of American business. A short overview of Marketing will also be covered as a part of the course. (Prereq: Qualifying score on CPT reading and writing assessment test) **3 cr**

**BUSN1010   MARKETING CONCEPTS AND
                        STRATEGIES**
An overview of basic marketing principles and practices, this course includes discussion of the marketing mix, the four 'p's' of marketing, buyer behavior, target markets, and electronic marketing concepts. Concepts will be learned through case studies and the creation of a marketing plan for a hypothetical company. (Prereq: Qualifying score on CPT assessment test OR ENGL0910) **4 cr**

BUSN1020   INTRODUCTION TO SELLING
This course covers the role of sales in the economy, the importance of a positive sales attitude, the basic steps of a sale, and how the salesperson is viewed as a representative of a company. The student will be required to conduct a sales presentation to a buyer of a product. (Prereq: Qualifying score on CPT assessment test OR ENGL0910) **3 cr**

BUSN1030   PROFESSIONAL DEVELOPMENT
Professional image and 'self-management' are the focus of this course. Professional appearance, wellness, time management, goal setting and techniques for the professional's response to various social settings will be addressed in this course. (Prereq: Qualifying score on CPT assessment test OR ENGL0910)
3 cr

**BUSN1040   COMPUTER APPLICATIONS FOR
                        SALES**
This course will focus on applications of spreadsheet and database software to monitor sales accounts, territories, and collect data for analysis of accounts. The student will use computer applications to make informed selling decisions. (Prereq: Qualifying score on CPT assessment test OR CPLT1000) **2 cr**

BUSN1050   INTRODUCTION TO MANAGEMENT

This course is an introduction into the exciting world of management. Today's managers are faced with many difficult and exciting challenges. Therefore, this lecture course covers the latest trends in management thinking that is essential to successfully guide large, small, profit and nonprofit, organizations toward their goals. (Prereq: Qualifying score on CPT reading and writing assessment test)   **3 cr**

BUSN1060   TERRITORY/ACCOUNT MANAGEMENT

This course covers identifying prospects, management of time in relation to territory assignments, management of territory for profit, how to schedule activities, develop sales strategies and maintain account records. The concepts will be learned through case studies or a live territory project. (Prereq: Qualifying score on CPT assessment test OR ENGL0910)   **3 cr**

BUSN1070   MANAGE CUSTOMER RELATIONS

This course focuses on personality traits that influence how salespeople can improve their interaction with the customer. As the workplace becomes more diverse; more flexible interaction skills are required. By applying techniques of flexible interaction in working with different personality styles the salesperson can develop more efficient, effective and productive relationships with the customer. (Prereq: Qualifying score on CPT assessment test OR ENGL0910)   **3 cr**

BUSN1080   SALES ACCOUNT ANALYSIS

It is essential that salespeople understand the basic components of financial analysis to explain and justify their recommendations to business clients. This course is designed to examine the parts of an income statement, operating ratios, ROI and how to increase the ROI. In addition, the course will focus on computation of an order, "terms of sale", trade/cash/chain discounts, inventory turn, and calculation of markups/markdowns. Inventory valuation, the calculation of inventory valuation and depreciation methods will also be covered. (Prereq: BUSN1040)   **3 cr**

BUSN1090   CONSULTATIVE SELLING

Sales people are problem-solvers and this course introduces the student to the problem-solving mindset and outlines a process for consulting with clients on issues concerning the clients' businesses. This process is based on a win-win strategy. The course focus is on clear communication techniques and business problem-solving skills that result in more productive client relationships. (Prereq: BUSN1020)   **4 cr**

BUSN1100   SUPERVISION

The focus of this course is on the first-line manager who coordinates and supervises the activities of the operating employees in any company. The course will emphasize effective ways to lead, motivate, delegate, communicate and measure the performance of employees who perform the day-to-day activities of the organization. (Prereq: Qualifying score on CPT assessment test OR ENGL0910)   **3 cr**

BUSN1140   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)   **3 cr**

BUSN1200   MANAGERIAL COMMUNICATION

It is essential that a manager in any organization understand how that organization communicates. This course is designed to improve the student's understanding of a manager's place within the organization and to provide an awareness of effective communication skills needed within an organization. The course will include a discussion of new organizational communication processes, status and power within an organization, sources of conflict within an organization and common communication methods used by managers within the organization. (Prereq: Qualifying score on CPT reading and writing assessment test)   **3 cr**

BUSN1300   E-BUSINESS
This course will teach students how to build a successful e-business. It will take the student through the entire process from strategic planning to actual fulfillment. It will provide the technical, operational and managerial details necessary for success. (Prereq: None) **3 cr**

BUSN2100   CAPSTONE
This is a 'capstone' experience usually taken during the last semester where business students will be required to work in teams using their skills to handle a case project or to complete a community service project. We may ask industry to review the work to evaluate their skills. (Prereq: BUSN1000, BUSN1050, BUSN1140, BUSN1200 and BUSN1300)   **3 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)   **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)   **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) **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)   **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)   **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)   **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) **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) **1 cr**

CARP1210   RESIDENTIAL ROOF COVERINGS
This course provides the student an opportunity to install residential roof coverings.
(Prereq: None) **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)   **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) **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)   **1 cr**

CARP1430   INSTALL CONCRETE SLABS
This course introduces the student to the procedures used to form, pour and finish concrete slabs. (Prereq: None)   **1 cr**

CARP1511   INSULATION AND DRYWALL
This course introduces the student to the property values of insulation and gypsum wallboard and proper installation of both.
(Prereq: None)   **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 parts. (Prereq: None)   **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 hardware. (Prereq: None)   **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)   **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 standard workbook and construction blueprints. (Prereq: None)   **1 cr**

CARP1820   RESIDENTIAL ESTIMATING
This course introduces the student to estimating materials for rough framing and interior and exterior finishing. (Prereq: None)   **2 cr**

CARP1830   BUILDING CODE
This course is a study of the parts of the State Building Code that relate to residential construction. (Prereq: None)   **1 cr**

**CARP1840   ENERGY EFFICIENT
                       CONSTRUCTION**
This course is a study of the State Energy Code and construction methods and strategies used to build energy efficient houses. (Prereq: None) **1 cr**

**CARP1850   INTRODUCTION TO COMPUTER
                       ASSISTED DRAWING**
This course will introduce students to a computer program for drawing blueprints. After completing the program, students will be able to draw and dimension a blueprint, insert windows and doors and accomplish other tasks. (Prereq: None)   **1 cr**

CBTG1110   BASIC JOINERY
This course is designed to introduce the student to the safe and proper use of hand and layout tools used to construct basic woodworking joinery. Course emphasis will be the hands-on techniques necessary to produce several required wood joints. (Prereq: None)   **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 woodworking power tools and stationary equipment used in the cabinet industry. One or more required projects will be fabricated by the student during the hands-on operation of the tools and equipment covered during this course. (Prereq: None) **3 cr**

CBTG1130   MATERIALS
In this course the student will learn the various wood and wood products used in cabinetmaking. Solid lumbers, plywoods, veneers, melamines, laminates, abrasives, adhesives and fasteners will be covered and discussed. (Prereq: None)   **1 cr**

CBTG1141   BASIC CASE CONSTRUCTION
This course covers the fundamentals of cabinet construction, including project layout, stockbilling and material selection. Basic construction techniques will be covered and demonstrated. Cabinet projects for the student are required to achieve the hands-on experience appropriate to the course. (Prereq: CBTG1120)   **4 cr**

CBTG1150   DRAFTING TECHNIQUES
This course is an application of drafting techniques as related to cabinetmaking. Drafting terms, instruments, sketches and drawings will be discussed. Various drafting illustration methods as well as pictorial views will be covered. (Prereq: CBTG1141)   **2 cr**

CBTG1161   BASIC LAMINATING
This course will introduce the student to the various types of plastic laminates available, other materials involved, hand tools, adhesives, preparation procedures necessary for the fabrication and practical application of decorative laminates. Required projects specializing in laminate constructions are emphasized. (Prereq: CBTG1120)   **2 cr**

**CBTG1210   LAMINATED PRODUCT
                       FABRICATION**
This course is designed to enlarge the students laminating abilities to complete, ready-to-install kitchen countertops, vanity tops and production laminating. Countertop installation, custom laminating including post-forming equipment and procedures will be covered. (Prereq: CBTG1120 and CBTG1161)   **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 necessary functioning tools of the cabinetmaking industry. (Prereq: CBTG1141) **3 cr**

CBTG1230   WOOD FINISHING
This course is designed to give the student a basic understanding of wood finishing materials and finish application methods. Spray equipment is utilized as the final finish is applied to wood and wood products. (Prereq: CBTG1120) **2 cr**

CBTG1240   MILLROOM OPERATIONS
This course will acquaint the student with millroom operations including knife-grinding procedures and molder set-up operation. (Prereq: CBTG1120) **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 CBTG1141)   **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, CBTG1141 and CBTG1150)   **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) **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)   **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)   **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)   **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)   **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)   **4 cr**

CBTG2440   INTRODUCTION TO CABINETWARE
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)   **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)   **2 cr**

CBTG2512   INTRODUCTION TO AUTOCAD
This course will introduce the student to basic AutoCAD techniques used in creating geometric shapes for woodworking shop drawings. (Prereq: None)   **4 cr**

CBTG2522   CNC ROUTER PROGRAMMING

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: CBTG2512 or instructor approval)   **3 cr**

CBTG2532   CNC ROUTER OPERATION

This course will cover basic programming techniques, setup, 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)   **3 cr**

CBTG2545   INTRODUCTION TO MICROVELLUM

This course will introduce the student to basic AutoCAD techniques used in creating geometric shapes, text and dimensioning in preparation of woodworking type shop drawings.
(Prereq: CBTG2512)   **3 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)   **0 cr**

CCIS1000   INFORMATION SYSTEMS

This is a beginning course for Computer Careers and will introduce the student to an overview of the IS principles which every computer student should understand. This course will present the changing role of the IS professional as well as introduce concepts that will be covered more fully in advanced classes.   (Prereq: Sufficient placement test scores)   **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 create forms and reports, macros, and switchboards.   (Prereq: CCIS1000 or CCIS1101)   **4 cr**

CCIS1035   WORD FOR WINDOWS

This word processing course will include the creation, editing and formatting of business documents. Students will also learn features including writing tools, working with tabs, merging, sorting, and creating headers/footers, and footnotes/endnotes. 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)   **3 cr**

CCIS1042   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)   **3 cr**

CCIS1080   MICROSOFT OFFICE 2003

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)   **3 cr**

CCIS1085   OPENOFFICE.ORG

OpenOffice.org is the open-source, multi-platform competitor to Microsoft Office, and is rapidly becoming the standard office suite for many businesses and governmental agencies. Students will be provided with the basics of word processing, spreadsheets, and presentations. It will be necessary to have access to a computer outside of class in order to complete the assignments. A copy of OpenOffice.org will be provided as part of the class. Also, a student computer lab is available on each campus. (Prereq: Sufficient placement test scores or instructor approval)   **3 cr**

CCIS1101   WINDOWS XP

This course provides an overview of computer hardware, software, and operating system concepts used on computers. Fundamentals of the operating system, Windows, are studied in-depth. Topics covered will include hardware, software, manipulating Windows, using Help, launching applications, managing files and folders with Windows Explorer and My Computer, Control Panel, organizing a disk, Printing and Fonts, customizing a computer system, maintaining files and disks, and connectivity. (Prereq: Sufficient placement test scores)   **3 cr**

CCIS1105   NETWORK ESSENTIALS

This course will provide exposure to networking concepts and technologies most commonly used in the global workplace, as well as typical network administration duties. Topics covered include: network topologies, protocols, standards & regulations, transmission media & speed, network design & hardware, TCP/IP addressing, subnetting & routing, CLI (DOS) usage & scripting, basic Linux and Windows administration, network security, risk assessment, and troubleshooting techniques. (Prereq: CCIS1101)   **4 cr**

CCIS1110   WINDOWS ADMIN 1

This is the first of three courses in network administration using Windows networks. The course will use Windows 2000/XP Professional-workstations in a 'workgroup' or peer-to-peer configuration, and will cover many configuration & 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: CCIS1105)   **3 cr**

CCIS1121   LINUX ADMIN 1

This course will introduce students to the Linux operating system, using the Command Line Interface (CLI) to perform both end-user and administrative tasks. Topics covered include file system navigation, file permission assignment user management, the vi editor, shell-scripts, printing, various shell features, and basic network services Students will also be exposed to various GUIs for Linux. (Prereq: CCIS1105)   **3 cr**

CCIS1135   DESKTOP LINUX

Linux isn't just a server operating system anymore: It's a full featured desktop, capable of playing movies, sounds, handling email and doing anything and everything that a Microsoft Windows machine can. This class will build the student's comfort level in the graphical environments common to Linux, as well as covering how to customize the interface to the user's liking. (Prereq: Sufficient placement test scores or instructor approval)   **3 cr**

CCIS1202   DATA COMMUNICATIONS 'GAP'

This on-line course is for students who have completed CCIS1210 (Network Principles), but did not complete CCIS1201. IP-addressing and subnetting will be the main focus of this course. (Prereq: CCIS1210)   **1 cr**

CCIS1211   NETWORKING PRINCIPLES 'GAP'

This on-line course is for students who have completed CCIS1201 (Data Communication), but did not complete CCIS1210. DOS-commands will be the main focus of this course. (Prereq: CCIS1201)   **1 cr**

CCIS1301   XHTML

This course will introduce students to the basics of XHTML (the web markup language) and prepare them for more advanced studies. Students will learn XHTML from the ground up, beginning with solid HTML concepts. Standards-based instruction will stress designing for backward and forward compatibility, usability, and accessibility. Students will develop and publish Web pages that include XHTML techniques while using tables, frames, and forms. (Prereq: CCIS1000 and CCIS1101)   **3 cr**

CCIS1310　PUBLISHER

This course is an introduction to desktop and Web-based publishing using Microsoft Publisher 2003. Students will learn how to create and enhance publications such as brochures, flyers, and newsletters and then convert them to web sites. Students will also integrate information and files from Word, Excel, Access, PowerPoint, and Internet Explorer while working with a variety of clip art and photographs. (Prereq: CCIS1101 or equivalent Windows experience)　**3 cr**

CCIS1320　FRONTPAGE

This course gives students an introduction to creating Web pages using MS FrontPage. Students will learn to plan, create, develop, publish and maintain a web site that includes shared borders, link bars, form components, search components and banner ad management. 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) **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 learning process. Skills are mastered via hands-on exercises and examples. (Prereq: CCIS1101)　**3 cr**

CCIS1351　ADVANCED XHTML

In this advanced course, students will learn the ins and outs of XHTML while moving on to the concept of replacing elements, such as frames and tables, with styles and layers to convert older pages to current standards. Students will develop and publish Web pages that include XHTML techniques while using advanced style methods to create more functional Web pages. (Prereq: CCIS1301)　**4 cr**

CCIS1410　CCNA-1: NETWORKING BASICS

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. (Prereq: CCIS1101) **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, IOS management, and access-lists. (Prereq: CCIS1410 or CCIS1105) **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 ethernet switching, VLANs, VTP, Spanning-Tree, and switched-LAN design. (Prereq: CCIS1421)　**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. (Prereq: CCIS1431)　**4 cr**

CCIS1450　CCNP-1: ADVANCED ROUTING

This course will expand on the topics introduced in CCNA-2 and CCNA-3, and will prepare students to take and pass the first Cisco Certified Network Professional (CCNP) test. Topics covered include scalable internetworks, VLSM, Multi-area OSPF, EIGRP, BGP, IS-IS, route filtering, route redistribution, and QoS. (Prereq: CCIS1441)　**4 cr**

CCIS1455　CCNP-2: REMOTE ACCESS

This course will expand on the topics introduced in CCNA-2 and CCNA-3, and will prepare students to take and pass the first Cisco Certified Network Professional (CCNP) test. Topics covered include modems, Windows 9x/2000/XP dial-up networking, PPP, PAP/CHAP authentication, ISDN, Frame-Relay, traffic shaping, WAN optimization, NAT, and troubleshooting. (Prereq: CCIS1441)　**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)
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)
3 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)   **4 cr**

**CCIS2051   MS OFFICE
                  INTEGRATION/OUTLOOK**

This course is designed to prepare students for
the workplace by using computer application
software to solve problems encountered in a
business environment. Emphasis will be on a
mastery of Microsoft Office suite application
software to complete multilayered projects.
Problem-solving methods will be employed
throughout the course. Students will learn to
share text, data and graphics among the

Microsoft office programs: Word, Excel, Access
and PowerPoint. Microsoft Outlook is an
integrated desktop information management
system that lets you manage your personal and
business information and communicate with
others.   (Prereq: CCIS1101 plus two of the
following: Word, Excel, Access, PowerPoint)
4 cr

CCIS2053   OFFICE INTEGRATION

This course is designed to prepare students for
the workplace by using computer application
software to solve problems encountered in a
business environment. Emphasis will be on a
mastery of Microsoft Office suite application
software to complete multilayered projects.
Problem-solving methods will be employed
throughout the course. The student will learn to
share text, data and graphics among the
Microsoft office programs: Word, Excel, Access
and PowerPoint.   (Prereq: CCIS1101 plus
OfficeXP OR two of the following: Word, Excel,
Access, PowerPoint)   **2 cr**

CCIS2054   OUTLOOK

The student will learn Microsoft Outlook which
is an integrated desktop information
management system that lets you manage your
personal and business information while
efficiently communicating with others.
(Prereq: CCIS1101 and OfficeXP or Word)   **2 cr**

CCIS2055   PROJECT MANAGEMENT

This course will teach students project
management skills utilizing Microsoft Project
2003 using a case-oriented problem-solving
approach. Content covers the basic to
intermediate Project 2003 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)   **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
CCIS1105)   **3 cr**

CCIS2070   DATABASE PROJECTS
This course is designed to give the student knowledge about how advanced Access database design, concepts, and features can be used in business situations. Students will implement the features in case studies that introduce realistic business problems and are focused on important types of business use for databases. (Prereq: CCIS1031)   **2 cr**

CCIS2080   SPREADSHEET PROJECTS
This course is designed to give the student knowledge about how advanced Excel spreadsheet design, concepts, and features can be used in business situations. Students will implement the features in case studies that introduce realistic business problems and are focused on important types of business use for spreadsheets. (Prereq: ACCT1125)   **2 cr**

CCIS2122   LINUX ADMIN 2
This course will expand on the topics introduced in Linux Admin-1, focusing on Linux-based solutions for providing 'network services' (web, FTP, e-mail, Windows file and printer sharing, DHCP, DNS). Additional topics include server hardening, advanced shell-scripts. (Prereq: CCIS1121)   **4 cr**

CCIS2125   INTRUSION DETECTION AND RESPONSE
This 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. Students will receive hands-on experience with intrusion detection systems and a variety of security tools. (Prereq: CCIS2122, CCIS2150 and CCIS2400)   **4 cr**

CCIS2150   WINDOWS ADMIN 2
This is the second of three courses in network administration using Windows 2000/2003 Server Operating System. This course will use a variety of 'workstation' operating systems in conjunction with Windows 2000/2003 Servers in several client-server configurations. Topics include working in active directory environments, printing, user account management, security management,

AD-Domain integration, accessing other (non - Windows) servers, IP-address management, DHCP, and DNS services. (Prereq: CCIS1110)   **4 cr**

CCIS2161   LINUX ADMIN 3
This course will further expand on the topics introduced in Linux Admin 1 and 2, focusing on mastery of Linux system automation. Shell scripting will be heavily emphasized, as will a variety of command-line utilities. Span-filtering and webmail systems will also be covered. (Prereq: CCIS2122)   **3 cr**

CCIS2221   NETWORK CONFIGURATION
This course will provide a practical knowledge of network concepts & hardware configuration. The course will give students the opportunity to set up and troubleshoot a variety of networking solutions. Topics covered will include the following: selecting and installing network cabling, configuring workstations, routing, implementing wireless networks, and configuring basic firewalls. (Prereq: CCIS2122 or CCIS2150)   **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)   **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)   **1 cr**

CCIS2270   WINDOWS ADMIN 3: 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. (Prereq: CCIS2150)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **2-8 cr**

CCIS2400   INFORMATION SECURITY ESSENTIALS
This course involves the fundamentals of networking concepts. It includes various concepts used in a TCP/IP network. The course highlights how information flows in a network through various hardware devices and protocols and how these impact network security. The course offers an overview of security issues that are typically considered when managing the infrastructure, internetworking and operations in a network. (Prereq: CCIS1105)   **3 cr**

CCIS2410   HACKER TECHNIQUES AND TOOLS
This course is an introduction to hacking tools and incident handling. Areas of instruction include various tools and vulnerabilities of operating systems, software and networks used by hackers to access unauthorized information. This course also addresses incident handling methods used when information security is compromised.   (Prereq: CCIS1105)   **4 cr**

CCIS2415   SECURITY POLICIES AND IMPLEMENTATION ISSUES
The course includes a discussion on security policies that can be used to help protect and maintain a network, such as Password policy, e-mail policy and Internet policy. The issues include organizational behavior and crisis management.   (Prereq: CCIS2400)   **3 cr**

CCIS2420   SECURITY SOLUTIONS-1 (CISCO)
This course will expose students to the array of security features that can be implemented using a companies existing Cisco router. 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: CCIS1421 and CCIS2400)   **4 cr**

CCIS2425   SECURITY SOLUTIONS-2 (PIX)

This course will expose students to the array of security features that can be implemented using a Cisco IPX security-appliance. 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: CCIS2400)   **4 cr**

CCIS2430   SECURITY SOLUTIONS-3 (WINDOWS)

This course discusses security implementations for Microsoft's Internet Security and Acceleration (ISA) Server. 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: CCIS2150 and CCIS2400)   **4 cr**

CCIS2435   SECURITY SOLUTIONS-4 (LINUX)

This course discusses a variety of Linux based security/firewall implementations. 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: CCIS2122 and CCIS2400)   **4 cr**

CCIS2450   SYSTEM FORENSICS INVESTIGATION AND RESPONSE

This course offers an introduction to system forensics investigation and response. Areas of study include a procedure for investigating computer and cyber crime and concepts for collecting, analyzing, recovering and preserving forensic evidence. (Prereq: CCIS2400)   **4 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: CCIS1505)   **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 and CCIS2701)   **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)   **2 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)   **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, CCIS1301 and any procedural programming language)   **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: CCIS1105)
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)   **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)
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)   **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)   **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 2005 or CCIS 2560)
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 with graphics, exception handling, database handling, 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)   **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)
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) **4 cr**

CCIS2751   ORACLE PL/SQL

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) **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) **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) **4 cr**

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) **4 cr**

CCIS2841   CLIENT/SERVER COMPUTING

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) **4 cr**

CCIS2865   IT AUDITING I

This course provides an overview of the IT Auditing profession and addresses the basic skills required by IT auditors as they conduct audits of information systems. Topics addressed include IT auditing standards; IT controls, including preventive, detective, and corrective controls; evaluation of policies, standards, and procedures; the IT audit organization, types of audit engagements; frameworks for management and applications controls, including CobiT; and audit objectives and scope. (Prereq: None) **4 cr**

CCIS2870   IT AUDITING II

This course addresses more advanced required by IT Auditors as they conduct audits of information systems. Topics include audit documentation; development and reporting of audit findings; the use of audit software; audit project management; legal and ethical issues; and IT control objectives for Sarbanes-Oxley compliance. (Prereq: CCIS2865) **4 cr**

CCIS2900   IT SYSTEMS MANAGEMENT

This course is designed to give the student an in depth understanding of data center operations and management. The planning and documentation that is required for a successful data center will be discussed. Students explore the challenges that IT departments face as they strive to provide mission critical services in a reliable and secure environment, focusing on the three elements of effective systems management: technology, processes, and people. (Prereq: None) **3 cr**

CHLD1100   CHILD CARE AS A PROFESSION

You will study career opportunities in the field of early childhood education. Curriculum areas such as art, literature and science will be introduced. Observational visits to different types of early education programs will be required. You will develop an awareness of the importance of culture in families.   (Prereq: Qualifying score on CPT writing assessment test) **2 cr**

CHLD1125   GUIDING CHILDREN'S BEHAVIOR

You will learn effective techniques for guiding children's behavior by participating in large and small group discussions, problem solving, and more! You will design a classroom that encourages pro-social behavior in children. You will learn to implement positive guidance techniques such as limit setting, verbal guidance, indirect guidance and redirection. For this course students should either be currently working with children or have consistent access to a group of children. (Prereq: Qualifying score on CPT writing assessment test)   **3 cr**

CHLD1150   LITERATURE AND LANGUAGE FOR CHILDREN

You will learn how to promote literacy in young children. You will practice a variety of storytelling techniques including reading books and using flannel boards. You will explore activities that encourage speaking, listening, reading, and writing. You will also explore social studies activities that help children learn about themselves and their family, friends and community. For this course students should either be currently working with children or have consistent access to a group of children. (Prereq: Qualifying score on CPT writing assessment test)   **3 cr**

CHLD1175   CREATIVE ACTIVITIES

You will use paint, playdough, glue, crayons, and glitter in this course. You will learn ways to promote creativity in young children, and develop your own creativity. You will plan and guide art and small motor activities with children. For this course students should either be currently working with children or have consistent access to a group of children. (Prereq: None)   **2 cr**

CHLD1500   CHILD GROWTH AND DEVELOPMENT

You will study basic growth and development of children from infancy through the schoolage years. Activities, materials and caregiving techniques will be explored for each age group. You will study the effects of media such as television and computers on children. (Prereq: Qualifying score on CPT reading assessment test)   **3 cr**

CHLD1525   HEALTH, SAFETY AND NUTRITION

You will learn ways to keep children safe and healthy. Topics include preventing illness and accidents, handling emergencies, and the negative effects of the environment on children. You will also learn to plan nutritious meals and snacks and to use effective techniques for supervising daily routines. (Prereq: Qualifying score on CPT reading assessment test)   **2 cr**

CHLD1550   COGNITIVE ACTIVITIES

You will discover the how, what and why of involving children in problem solving by exploring math, science and sensory activities. You will use walks and field trips to further explore cognitive concepts. For this course students should either be currently working with children or have consistent access to a group of children. (Prereq: None)   **2 cr**

CHLD1575   MUSIC AND MOVEMENT ACTIVITIES

You will use music and movement to encourage self expression in children. You will participate in music activities using songs and musical instruments, drama activities using puppetry and story dramatization, and developmentally appropriate movement activities. For this course students should either be currently working with children or have consistent access to a group of children. (Prereq: None)   **2 cr**

CHLD1700   PRACTICUM - LAB PRESCHOOL

You will gain experience working with preschool children in the high quality Lab Preschool program at Hennepin Technical College. You will assist the head teacher in handling all aspects of the program, including planning and presenting developmentally appropriate activities. You will head-teach for one week. You will practice mentoring other staff, design activities to meet the individual needs of children, and keep a daily journal of your experiences. (Prereq: Qualifying score on CPT writing assessment test or Instructor approval) **3 cr**

CHLD1725   PRACTICUM - SPECIAL NEEDS

You will work with special needs children, assisting the head teacher in handling all aspects of the program. You will explore different learning styles, categories of special needs, adaptive equipment; and use this information to plan and present activities. You will keep a daily journal of your experiences. (Prereq: Qualifying score on CPT writing assessment test)   **3 cr**

CHLD1750   PRACTICUM - CHOICE

You will work with children in an early childhood or school setting under the supervision of a mentor teacher. Choices of settings include infant-toddler, preschool, or schoolage programs. You will assist the head teacher in handling all aspects of the program, and will plan and present developmentally appropriate activities. You will keep a daily journal of your experiences. (Prereq: Qualifying score on CPT writing assessment test)   **3 cr**

CHLD2000   INTEGRATING CHILDREN WITH SPECIAL NEEDS

You will recognize the needs and differences of children and the importance of treating each child as an individual. You will observe and assess children's development using a variety of methods and study types of special needs and strategies for working effectively with children. For this course students should either be currently working with children or have consistent access to a group of children. (Prereq: Qualifying score on CPT reading assessment test)   **3 cr**

CHLD2026   PROFESSIONAL LEADERSHIP

You will discuss reasons for becoming a teacher, ways to advocate in this profession and will develop a plan for continuous education and professional development. You will join a professional organization and attend a professional conference. You will improve your skills in working with others by learning strategies for team building, coping with stress and problem solving. You will study professional ethics and procedures for evaluating staff. (Prereq: CHLD1100 and 10 additional credits in Child Development)   **3 cr**

CHLD2050   SUPPORTING CHILDREN'S PLAY

You will study children's play problems and identify strategies to prevent and resolve problem behaviors in the child care setting. You will examine how temperament affects behavior.   (Prereq: Qualifying score on CPT writing assessment test)   **2 cr**

CHLD2075   FAMILY AND COMMUNITY ISSUES

You will examine how to work with many types of families. You will examine the importance of the family/school partnership, study methods of effectively communicating with families, and identify community organizations and networks that support families. (Prereq: Qualifying score on CPT writing assessment test)   **3 cr**

CHLD2100   CHILD ABUSE AND NEGLECT

You will identify categories of abuse and neglect and the procedure for reporting, and study methods of working with high risk families. (Prereq: Qualifying score on CPT reading assessment test)   **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. For this course students should either be currently working with children or have consistent access to a group of children. (Prereq: Qualifying score on CPT writing assessment test)   **3 cr**

CHLD2140   CURRICULUM FOR INFANTS AND TODDLERS

You will study curriculum design methods for infants and toddlers in either home or center based settings. You will use observations and assessments to create activities and materials that nurture children's development. You will design a unit of curriculum to be used with infants and toddlers.   For this course students should either be currently working with children or have consistent access to a group of children. (Prereq: Qualifying score on CPT writing assessment test and CHLD2126 or 5 years experience in Infant/Toddler care)   **2 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. For this course students should either be currently working with children or have consistent access to a group of children. (Prereq: Qualifying score on CPT writing assessment test)   **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. For this course students should either be currently working with children or have consistent access to a group of children. (Prereq: Qualifying score on CPT writing assessment test)   **3 cr**

CHLD2301   CURRICULUM PLANNING FOR THE WHOLE CHILD

You will examine various curriculum models and construct an appropriate unit lesson plan using the Core Competencies for Early Childhood Education and Care Practitioners in Minnesota. You will examine assessment tools utilizing the Early Childhood Indicators of Progress framework and demonstrate the facilitator's role in assessing children. (Prereq: Qualifying score on CPT writing assessment test)   **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)   **1 cr**

CHLD2525   ADVANCED COGNITIVE ACTIVITIES

You will review developmental theory in practice, and apply math and science concepts by preparing lesson plans and units. For this course students should either be currently working with children or have consistent access to a group of children. (Prereq: Qualifying score on CPT writing assessment test)   **1 cr**

CHLD2530   ADVANCED GUIDANCE METHODS

You will refine your skills, moving beyond beginning guidance techniques. You will analyze challenging behaviors, conduct observations, develop a behavioral plan, and evaluate changes in behavior. For this course students should either be currently working with children or have consistent access to a group of children. (Prereq: Qualifying score on CPT writing assessment test and CHLD1125)   **2 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)   **1 cr**

COMM1016 TEAM BUILDING 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)   **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 salable resume and application letter, and present one's self effectively in an interview. (Prereq: None)   **2 cr**

COMM1016 TEAM BUILDING IN THE WORKPLACECOMM1050 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)   **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 writing assessment test OR ENGL0910)   **3 cr**

COMM1131 CUSTOMER SERVICE IN THE WORKPLACE

Our society is increasingly becoming less customer service oriented. Therefore it follows that there is a growing need for the development of customer service skills. This is an college level introductory course in customer service practices. This course describes what customer service is and how it impacts profitability and productivity of most businesses. The course addresses the challenges in the delivery of customer service, strategies used in customer service and the personal skills necessary to achieve value added experiences for the customer. (Prereq: Qualifying score on CPT assessment test OR ENGL0910)   **2 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: Qualifying score on CPT reading assessment test)   **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. Basic computer literacy skills required)   **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. Basic computer literacy skills required)   **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. Basic computer literacy skills required)   **3 cr**

CPLT0900   KEYBOARDING AND COMPUTER BASICS
This course will introduce the non-computer user to the following basic computer concepts: booting up and shutting down the computer; sending and receiving email; and creating, saving, and printing short Microsoft Word documents. Students will also learn basic keyboarding skills. (Prereq: None) (BP) **2 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)   **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)   **3 cr**

CPLT1010   KEYBOARD SKILL BUILDING
This course involves the 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) **2 cr**

CPLT1060   INTERNET QUICK START
This introductory course provides basic instruction on the use of the Internet and e-mail. Topics covered 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)   **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)   **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 dock and preference, multitasking features, basic Internet access, e-mail functions, page set-up, printing specifics, IPhoto, IMovie, and other features that are drawing, painting, and spreadsheet functions. (Prereq: None)   **3 cr**

CULA1105 INTRODUCTION TO CULINARY ARTS

This course is designed to introduce the foodservice 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) **3 cr**

CULA1115 FOODSERVICE 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) **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) **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) **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) **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) **4 cr**

CULA1161 ADVANCED SUGAR WORK

This course is designed to give the students advanced knowledge, skill and understanding in the various types of sugar work: Gumpaste, Cold Porcelain, Pulled & Blown Sugar. (Prereq: CULA1115) **3 cr**

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) **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) **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) **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) **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)   **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)   **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) **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)   **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)   **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)   **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)   **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)   **3 cr**

CULA1515   COOKING WITH ALE AND LAGER

The course is designed to give students an understanding of international brewing styles and beer's place as a cooking ingredient and accompaniment to menu planning. Students

will study how grain, hops and yeast are combined to develop the different styles of beer and how those styles lend themselves to the dining enjoyment. The lecture/lab class will include menu planning, preparation and assessment. (Prereq: None)   **2 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)   **3 cr**

CULA2000   AMERICAN CULINARY FEDERATION CERTIFICATION
Practical test for American Culinary Federation (ACF) Certification. (Prereq: Knowledge of the American Culinary Federation (AFC) standards) **0 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)   **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)   **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)   **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) **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)   **3 cr**

CULA2160   HOSPITALITY LAW
An overview of the legal issues and requirements associated with operating a foodservice 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)   **3 cr**

CULA2170   FACILITIES DESIGN AND MAINTENANCE
Proper foodservice 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)   **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 foodservice establishment. You will receive feedback from your supervisor and keep a journal recording and reflecting on your work experience. (Prereq: None)   **3 cr**

DNTL1000   DENTAL TEAM/PRACTICE MANAGEMENT
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) *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) *3 cr*

DNTL1140   DENTAL MATERIALS
This course will introduce the student to various materials used in dentistry. These include 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. Laboratory equipment use and safety measures will be emphasized, as well as lab emergencies protocol. (Prereq: DNTL1000 and DNTL1120 or concurrent and qualifying score on CPT reading and writing assessment test) *3 cr*

DNTL1160   PRECLINICAL 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 learn about anesthesia and pharmaceuticals used in dentistry. Hazardous communication and management in the dental office is also included. (Prereq: DNTL1000 and DNTL1120 or concurrent, and qualifying score on CPT reading and writing assessment test) *3 cr*

DNTL1180   CHAIRSIDE ASSISTING I
In this course the student will identify dental office design, assemble tray set-ups and complete an intra oral examination and services rendered. Students gain knowledge about dental supplies and inventory control, basic dental equipment, its maintenance and safety, dental instruments and their groups, handpieces and rotary instruments. Anesthetic syringe and Tofflemire matrix and T-bands will also be included in this course. Practical learning experience will include how to chart the oral cavity, 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) *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) *2 cr*

DNTL1220   CHAIRSIDE ASSISTING II
This course is designed to develop skills in four-handed dental assisting, including tray set up 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) *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) *4 cr*

DNTL1261   EXPANDED FUNCTIONS

This course is designed for the students to learn and practice the expanded functions in the Hennepin Technical College clinics. These procedures are required by the Minnesota State Board of Dentistry to be eligible to take the Minnesota Registration examination. The student must successfully complete this course with a grade of C or better. (Prereq: CPR Certified, Hepatitis B Vaccine or written decline, DNTL1000, DNTL1120, DNTL1140, DNTL1160, DNTL1180, DNTL1220, DNTL1241 and DNTL1200 or concurrent)   **7 cr**

DNTL1321   CLINICAL EXTERNSHIP I

This is a partnership between Hennepin Technical College and a dental facility. This course provides the opportunity for the student to perform skills learned in the program and apply them to an employment like environment. This will include general dentistry and specialties such as oral surgery, orthodontics, endodontics, public health or pediatric dentistry. The student is required to satisfactorily perform two patient mechanical polishes during Clinical Externship I or II. (Prereq: CPR Certified, Hepatitis B Vaccine or written decline, DNTL1000 thru DNTL1261)   **4 cr**

DNTL1325   CLINICAL EXTERNSHIP II

This is a partnership between Hennepin Technical College and a dental facility. This course provides the opportunity for the student to perform skills learned in the program and apply them to an employment like environment. This will include general dentistry and specialties such as oral surgery, orthodontics, endodontics, public health or pediatric dentistry. The student is required to satisfactorily perform two patient mechanical polishes during Clinical Externship I or II. (Prereq: CPR Certified, Hepatitis B Vaccine or written decline and DNTL1321)   **4 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)   **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)   **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)   **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) **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)   **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) **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 bread-boarding and/or computer simulation software. (Prereq: ELEC1250 or equivalent)   **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, ELEC1300 and ELEC1450 or equivalent)   **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) **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) **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)   **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)   **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)   **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)   **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. 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) **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) **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) **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) **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) **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) **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) **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) **2 cr**

ELEC2420   TELEMETRY

This course covers the fundamental concepts of signal interfacing and telemetry circuits in industrial situations. (Prereq: ELEC2400) **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) **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) **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)   **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: EMGT1100)   **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: EMGT1105)   **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: EMGT1110)   **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: EMGT1115)
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: EMGT1120)   **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: Qualifying score on CPT reading assessment test, current CPR Health Care Provider certification (offered 1st week of class), 18 years old, required vaccinations, and background studies will be required)   **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)
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) **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)   **1 cr**

EMSV1120   AMBULANCE CLINICAL

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 ride-along clinical 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)   **2 cr**

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 driver's license with good driving record)   **1 cr**

EMSV1135   UNDERSTANDING EKGS

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 or NURS1111 and NURS1130)   **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 Training Center (TC) 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) **1 cr**

EMSV1146   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)   **3 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)   **3 cr**

EMSV1155   PHLEBOTOMY TECHNIQUES

In this course, you will learn venipuncture 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. Scrubs are required. Books available at Campus Bookstores. (Prereq: EMSV1100 or NURS1111 and NURS1130)   **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)   **7 cr**

EMSV1170   ER PROCEDURES AND CLINICAL

This course will provide the student with the necessary skills to assist with various Emergency Dept. (ED) procedures such as IV set up, 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 set up and removal, splints, crutch sizing and usage. Upon completion of classroom/lab sessions students will participate in a clinical in a ED setting by observing patient care. This will take place in the Emergency Department. Books available at Campus Bookstores. (Prereq: EMSV1100, EMSV1110 and EMSV1146)   **3 cr**

EMSV1175   EMT BRIDGE COURSE

This course is designed for current Minnesota EMSRB Certified First Responders who wish to become EMT-B without taking the full EMT-B class. In order to qualify for this class, you must pass a First Responder written exam plus perform one random skill in the first class session. All subject areas from the EMT-B curriculum will be covered. EMT clinical

observations are included. Upon successful completion of this course and NREMT Practical Skills exam (using a simulation manikin with scenarios), you are eligible to take the NREMT written exam administered by the State EMSRB (additional $20 fee required). State and National certifications will be issued upon passing these tests. Required books available at Campus Bookstores. (Prereq: Current Minnesota First Responder Certificate)   **3 cr**

EMSV1180   PRINCIPLES OF BASIC LIFE SUPPORT FOR HEALTHCARE PROVIDERS

This course is intended for students in healthcare-related programs needing CPR certification, as well as students desiring more depth in their knowledge in Basic Life Support (BLS). The student will receive an American Heart Association card showing certification as a provider of BLS for Healthcare Providers. Anatomy, physiology and pathophysiology as it relates to heart disease and stroke will be discussed. Certification in adult, child, and infant Cardiopulmonary Resuscitation (CPR) and choking will be provided using the latest guidelines provided by the American Heart Association. Personal and victim safety, ethical/legal considerations, and special resuscitation situations will also be discussed. (Prereq: SSCI1020 OR Current CPR certification OR taken currently with EMSV1100)   **1 cr**

EMSV1250   FIRST RESPONDER BLENDED E-LEARNING

This course blends online training with hands-on classroom skills training. You will work within a rich, interactive, multimedia CD-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, will 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-four (24) hours of hands-on skill practice training and practical tests, on campus, are required.   (Prereq: None)   **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)   **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)   **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)   **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)   **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 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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)　**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)　**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)　**4 cr**

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)　**3-4 cr**

ENGL0901　READING TECHNIQUES

This course is designed for students who need to improve basic reading skills necessary for success in college course work. Reading Techniques will focus on the development of vocabulary strategies and literal comprehension techniques. (Prereq: Qualifying score on CPT reading assessment test. Basic computer literacy skills required)　**3 cr**

ENGL0906　ENGLISH SKILLS I

This course is designed for students who need to improve their grammar skills to be more effective writers. Students will study basic grammar, its usage, and end punctuation. (Prereq: Qualifying score on CPT English assessment test. Basic computer literacy skills required)　**3 cr**

ENGL0921　APPLIED READING TECHNIQUES

This course is structured to give students an opportunity to apply the basic vocabulary and comprehension skills learned in Reading Techniques. In addition, the course will focus on higher level thinking skills including drawing inferences and reading critically. (Prereq: Qualifying score on CPT reading assessment test OR a grade of C or better in ENGL0901. Basic computer literacy skills required)　**3 cr**

ENGL0926　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 basic grammar, usage, and punctuation skills. (Prereq: Qualifying score on CPT English assessment test or completion of ENGL0906 with a grade of C or better. Basic computer literacy skills required)　**3 cr**

ENGL0930 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. Students in this course will learn to write coherent, grammatically-correct sentences and use those skills to write six different types of paragraphs. (Prereq: Qualifying score on CPT writing assessment test or completion of ENGL0926 with a grade of C or better and the ability to word process simple documents. Basic computer literacy skills required) **4 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 writing assessment test OR ENGL0930. Basic computer literacy skills required) **1 cr**

ENGL1010 BUSINESS ENGLISH

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: Qualifying score on CPT writing assessment test OR ENGL0926) **3 cr**

ENGL1021 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 writing assessment test OR ENGL0930. Basic computer literacy skills required) **3 cr**

ENGL1026 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 writing assessment test OR ENGL0930. Basic computer literacy skills required) **3 cr**

ENGL2121 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 writing assessment test OR ENGL1021 or ENGL1026. Basic computer literacy skills required) **4 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 writing assessment test OR ENGL1021 or ENGL1026. Basic computer literacy skills required) **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 writing assessment test OR ENGL1021 or ENGL1026. Basic computer literacy skills required) **3 cr**

ENGL2135   SPECIAL TOPICS: ENGLISH COMPOSITION TRANSFER CURRICULUM

This class is meant for students who have already taken a 3 semester credit 2000-level composition class at another institution. This course assumes the student has already achieved an understanding of writing basics: intro, body, conclusion; organization; outlining; the thesis; etc. Therefore, this class will focus on the research paper; specifically, an argument paper. This paper will be 6-10 pages in length, and will give the student the opportunity to demonstrate their writing proficiency, as well as guarantee they understand the research and citation process, and how to demonstrate critical thinking in writing and research. (Prereq: Accredited 3 semester credit, 2000-level composition class or its equivalent. This class is only for students who have taken and successfully completed a 3 semester credit composition course. Basic computer literacy skills required)   **1 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)   **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) **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) **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)   **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)   **3 cr**

ENSL0700   GRAMMAR/WRITING 1

This course presents an overview of basic writing skills. It includes presentation of basic grammatical structures and rules necessary for clear writing at the sentence and paragraph levels, with an emphasis on moving towards technical and academic writing. It is for ELL students with a low intermediate level of English and is part one of a two-part series consisting of Grammar/Writing 1 and Grammar/Writing 2. (Prereq: Qualifying score on ESL assessment test)   **4 cr**

ENSL0710   GRAMMAR/WRITING 2

This course presents an overview of basic writing skills. It includes presentation of basic grammatical structures and rules necessary for clear writing at the sentence and paragraph levels, with an emphasis on moving towards technical and academic writing. It is for ELL students with a low intermediate level of English and is part two of a two-part series consisting of Grammar/Writing 1 and Grammar/Writing 2. (Prereq: Qualifying score on ESL assessment test and ENSL0700)   **4 cr**

ENSL0720 READING 1

This course presents an overview of basic reading strategies. It is designed as a foundational course, preparing students for a subsequent introduction to technical college-level text. It is for ELL students with a low intermediate level of English. It is part one of a two-part series consisting of Reading 1 and Reading 2. (Prereq: Qualifying score on ESL assessment test) **2 cr**

ENSL0730 READING 2

This course presents an overview of basic reading strategies. It is designed as a foundational course, preparing students for a subsequent introduction to technical college-level text. It is for ELL students with a low intermediate level of English. It is part one of a two-part series consisting of Reading 1 and Reading 2. (Prereq: Qualifying score on ESL assessment test and ENSL0720) **2 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: Qualifying score on ESL assessment test OR Grade of 'C' or better in ENSL0925) **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: Qualifying score on ESL assessment test OR Grade of 'C' or better in ENSL0920) **4 cr**

ENSL0831 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: Qualifying score on ESL assessment test OR Grade of 'C' or better in ENSL0710) **3 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) **2 cr**

ENSL0850 ADVANCED READING AND PRONUNCIATION

This course prepares ELL students with an overview of leadership development issues by focusing on advanced reading and oral skills. The content of the course will be delivered through reading material that will then require analysis or an oral application of some kind. These assigned texts will incorporate case study situations, interpersonal communication issues, leader biographies, and general topics related to leadership. It will further require students to apply the material being studied through role plays, presentations, and small group interactions. This course is for ELL students with an intermediate level of English or higher. (Prereq: Qualifying score on ESL assessment test OR Grade of 'C' or better in ENSL0810 and ENSL0820) **3 cr**

ENSL0860   GRAMMAR THROUGH WRITING

This three credit course bridges English Language Learners to the 900 level English writing courses - Fundamentals of Writing (ENGL0910) and builds on the skills and strategies gained from ENSL0830 (Writing Through Technology). This computer lab course facilitated in part through Desire to Learn (D2L) will stress important grammar structures within technical and academic writing at the paragraph and introductory essay level. Course assignments will focus on a writing purpose for authentic audience. Students will be assessed using a portfolio. This course is for ELL students with an intermediate level of English or higher. (Prereq: Qualifying score on ESL assessment test OR Grade of 'C' or better in ENSL0810, ENSL0831 and ENSL0942. Basic computer literacy skills required)   **3 cr**

ENSL0870   MANUFACTURING INTRODUCTION FOR ENGLISH LANGUAGE LEARNERS (ELL'S)

This course prepares ELL students to enter their manufacturing related program courses through the successful completion of three parts. First, it will provide an overview of foundational manufacturing knowledge through selected readings in the Basic Technical English textbook. Next, students will work in teams or pairs to solve problems, troubleshoot, and use critical thinking skills related to manufacturing issues. Here, students will be accountable for being able to explain how they solved the task. Finally, students will be required to apply the foundational material and troubleshooting skills toward the completion of 'hands-on projects'. Some of these projects will be applicable across manufacturing disciplines and some will be specific to the student's chosen program area.

Being a team taught course, students will have access to both a language instructor and a manufacturing instructor. Most of the time will be spent with the English language instructor addressing vocabulary, pronunciation, and reading strategies. Additional time will be spent with the manufacturing instructor applying the information and demonstrating understanding. This course is for ELL students with an intermediate level of English or higher.

(Prereq: ESL assessment test - graded out at the appropriate level - or Successful completion with a C or better in the Math, Measurement, & Materials and Reading for Career Education courses and/or are currently enrolled in a Manufacturing program) **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)   **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) **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)   **2 cr**

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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **2 cr**

ENSL0985   VOCABULARY FOR HEALTH CAREERS
This content course for ELL students will help them as they transition into their health career programs primarily Pre-Nursing, Health Unit Coordinator, or Dental Assisting. It will help ELL students entering a health career understand the vocabulary, pronunciation, and spelling associated with body systems, nutrition and infection needed for their field of study. Students will also learn study skills, such as using text book study aids, reading for main idea, note taking, test taking, and mnemonics. (Prereq: High School Diploma or concurrently enrolled under the PSEOP or GED program. Qualifying scores on the CPT and writing assessment test or qualifying score on the ESL intake assessment, LOEP)   **2 cr**

ENSL0990   CLIENT COMMUNICATION FOR HEALTH CAREERS
This course prepares ELL students to communicate more effectively with clients in a variety of healthcare settings such as nursing home, a primary care clinic or a dental clinic. The course will provide instruction and practice in areas of oral communication such as conversation management, patient instruction, process description, etc. (Prereq: Qualifying score on ESL assessment test OR Grade of 'B' or better in ENSL0820 and/or qualifying score on the Certified Nursing Assistant Assessment)   **3 cr**

ENSL0996   APPLIED READING FOR HEALTH CAREERS

This four credit course for English Language Learners will help them as they transition into their health career programs, primarily Pre-nursing, Health Unit Coordinator, or Dental Assisting. This is a content-based reading and study skills course that uses reading material focusing on cross-cultural issues within the healthcare industry such as mental health, aging, death and dying, and sexual health to develop the reading and study skills required for success in the entry-level health career program courses. The course will focus on developing and applying reading strategies for college-level texts. Additionally, the course will focus on developing and applying vocabulary learning strategies needed to deal with the large amount of new vocabulary students need to master in the field of nursing. (Prereq: Qualifying score on the ESL intake Assessment, LOEP OR ENSL0850 with a grade of B or better) **4 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) **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) **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) **3 cr**

FDAS1300   RELATED MECHANICAL SKILLS

This course provides the student with a fundamental understanding of the automotive industry. It will also give students a working knowledge of various service procedures for routine maintenance of today's automobile. Furthermore, students will set-up and use their Ford Web-course training modules. (Prereq: None) **1 cr**

FDAS1400   CLUTCHES/DIFFERENTIALS

This course will detail the fundamentals, operation and repair of clutches, differentials, and transfer cases used on Ford Vehicles. (Prereq: None) **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) **2 cr**

FDAS1500   ENGINE REPAIR

This hands-on course teaches proper disassemble, assembly, repair, and diagnostic techniques for Ford engines. This course also includes how to identify and measure critical clearances. (Prereq: None) **3 cr**

FDAS1550   ENGINE OPERATION

This will consist of basic engine theory of operation, types of engines, and preventative maintenance service used in Ford vehicles. (Prereq: None) **2 cr**

FDAS1600   FORD SUSPENSION AND ALIGNMENT

This course will detail different types of suspension systems used on Ford vehicles. Furthermore, the student will learn to perform two and four wheel alignment procedures. (Prereq: None) **2 cr**

FDAS1611   NOISE VIBRATION HARSHNESS (NVH)

This course will provide the student with the skills and knowledge to pinpoint a NVH concern on a Ford motor company vehicle. (Prereq: FDAS1400 and FDAS2230) **3 cr**

FDAS1650   FORD STEERING AND BALANCE

In this course the student will analyze the steering systems used on Ford vehicles. The student will learn to troubleshoot, diagnose and repair steering systems using a hands-on approach with late model Ford vehicles. It also includes tire construction and repair, vibration diagnosis, and electronic balance procedures. (Prereq: None) **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) **3 cr**

FDAS1750   FORD FUEL SYSTEMS
This course will detail the fundamentals, operation and repair of Ford fuel systems. (Prereq: None)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **3 cr**

**FDAS2502   FORD ADVANCED ENGINE
                PERFORMANCE**
This course is designed to provide the student with hands-on application of guided diagnosis and testing of driveability concerns. The course emphasizes the SSCC process as well as critical thinking skills while performing engine performance concerns. (Prereq: FDAS1250, FDAS1260 and FDAS1750) **3 cr**

FDAS2551   FORD DI 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)   **3 cr**

FDAS2600   FORD BRAKING SYSTEMS
This course will detail the brake systems of Ford Motor Company cars and light trucks. It includes ABS operation, hydraulic components, machining and repair of drums and disc brake systems. (Prereq: None)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **3 cr**

FLPW1320   HYDRAULIC CIRCUITS

This course will cover setup 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)   **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)   **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)   **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) **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) **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) **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) **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) **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) **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)   **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)   **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)   **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)
1-6 cr

**FLPW2450   HYDRAULIC SPECIALIST
                       CERTIFICATION EXAM**

Students who pass the national Hydraulic Specialist Exam are certified as Hydraulic Specialists. Students who pass both the national Hydraulic Specialist Exam and the national Pneumatic Specialist Exam are certified as Fluid Power Specialists. Students must pay a separate fee for both exams to the Fluid Power Society.   (Prereq: Instructor approval)   **0 cr**

**FLPW2460   PNEUMATIC SPECIALIST
                       CERTIFICATION EXAM**

Students who pass the national Pneumatic Specialist Exam are certified as Pneumatic Specialists. Students who pass both the national Pneumatic Specialist Exam and the national Hydraulic Specialist Exam are certified as Fluid Power Specialists. Students must pay a separate fee for both exams to the Fluid Power Society.   (Prereq: Instructor approval)   **0 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. Student must be 18 years of age by the course start date. (Prereq: Physical exam and Lung Function Exam (OSHA 1910.134))   **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. Student must be 18 years of age by the course start date. (Prereq: FRPT1100)   **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)   **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 one 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) **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)   **2 cr**

FRPT1125   FIRE INVESTIGATION BASIC

This course is designed to teach the student the basic skills needed for fire investigations. (Prereq: None)   **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)   **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)   **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)   **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) **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)   **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) **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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) **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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) **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) **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) **1 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) **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) **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) **1 cr**

HLUC1050 COMMUNICATION SKILLS FOR THE HEALTH UNIT COORDINATOR

This course will introduce the HUC student to communication skills which are essential to the profession. Topic areas include telephone techniques, behavior styles, communication with other cultures, stress management, critical thinking, problem solving, unit communication devices, customer services and related receptionist duties. (Prereq: None) **1 cr**

HLUC1061 DIAGNOSTIC AND THERAPEUTIC PROCEDURES

This course is designed to acquaint the student with diagnostic tests and procedures, medication orders, therapies and nursing procedures. The student will become familiar with terminology necessary to transcribe physician orders. Beginning transcription skills will be practiced. (Prereq: Successful completion of HLUC1001 and HLUC1020) **3 cr**

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) **3 cr**

HLUC1120   EXPANDED HUC ROLE
This course is designed to explore alternative professional opportunities for the Health Unit Coordinator. As technology in healthcare changes, the tasks which are carried out by the Health Unit Coordinator may also change. This class will explore employment opportunities for the HUC in such venues as the hospital, physician's office and long tern care.
(Prereq: None)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)
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)
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)   **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)
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)
2 cr

HVAC1120   PSYCHROMETRICS
This course will introduce the student to the fundamentals of air properties. (Prereq: None)
1 cr

HVAC1130   ROOM AIR CONDITIONERS
This course will introduce the skills for troubleshooting and servicing room air conditioners. (Prereq: HVAC1000 and HVAC1040)   **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)   **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)   **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)   **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)   **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)   **1 cr**

HVAC1175   R-410A CERTIFICATION TRAINING
These newly manufactured R-410A air conditioning systems will require contractors and technicians to shift to different tools and equipment, safety standards and fundamentals when installing, changing out (retrofitting) older split A/C systems, and repairing systems in the field. R-410A operates at significantly higher pressures and refrigeration capacity. This course will prepare you for these new challenges, and with successful completion of the certification exam, show evidence of your professional ability to safely handle and work with this new generation of refrigerants and air conditioners. (Prereq: None)   **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)   **1 cr**

HVAC1185   R-410A CERTIFICATION EXAM
This examination is certified by the AC/R Safety Coalition and Packaged by ESCO institute. (Prereq: HVAC1175 or knowledge of HVAC systems operations)   **0 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: Residential HVAC Diploma or equivalent industry experience)   **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: Residential HVAC Diploma or equivalent industry experience)   **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: Residential HVAC Diploma or equivalent industry experience)   **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: Residential HVAC Diploma or equivalent industry experience)   **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)   **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: Residential HVAC Diploma or equivalent industry experience) **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 HVAC Diploma or equivalent industry experience)   **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: Residential HVAC Diploma or equivalent industry experience)   **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)   **2 cr**

HVAC2121   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: Residential HVAC Diploma or equivalent industry experience)   **4 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: Residential HVAC Diploma or equivalent industry experience)   **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: Residential HVAC Diploma or equivalent industry experience)   **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: Residential HVAC Diploma or equivalent industry experience)   **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: Residential HVAC Diploma or equivalent industry experience) **1 cr**

HVAC2165   AIR HANDLING UNITS

This course will offer an analysis of different air handling units including face-bypass, hot deck-cold deck, reheat coils, and HRV's. (Prereq: Residential HVAC Diploma or equivalent industry experience)   **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)   **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)   **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)   **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)   **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)   **1 cr**

LANG1000   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)   **3 cr**

LANG1010   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: LANG1000 or instructor approval)   **3 cr**

LANG1100   BEGINNING SPANISH I
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)   **4 cr**

LANG1110   BEGINNING SPANISH II
This course will build on the basic conversational skills developed in Beginning Spanish I. Students will learn to speak about personal and work-related themes in the past, present, and future. Additional focus will be given to pronunciation, reading, writing, and listening skills. Students will address issues related to cultural diversity in Minnesota and the nation as a whole. This would include a field trip to Spanish-speaking neighborhoods in the Minneapolis area. (Prereq: LANG1100 or instructor approval)   **4 cr**

LANG1115   SPANISH FOR HEALTH CAREERS
In this course, students will learn basic conversational Spanish as it relates to medical careers, proper pronunciation of medical terms in Spanish, and how to be culturally sensitive in interactions with Spanish-speaking patients. (Prereq: None)   **3 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)   **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)   **4 cr**

LNDC1131   ARBORICULTURE I
This course is designed to give students a fundamental knowledge of the care of woody plants in the landscape. Topics covered include: values and benefits of trees; proper planting techniques; extensive study and lab work on formative, corrective, and renewal pruning techniques; site and soil problems; serious insect and diseases that affect landscape trees; woody invasive species management; construction damage prevention; and information resources via the web, professional organizations, and state agencies.
(Prereq: None)   **3 cr**

LNDC1135   ARBORICULTURE II

This course is a continuation of Arboriculture I and is designed to give students a fundamental knowledge of the care and recognition of problems facing woody plants in the landscape. Topics covered include: spring digging, care, and planting of bare root stock; ANSI & MnDOT industry standards; fine tree pruning to 12' height; storms & damage; hazard trees; soil remediation; plant appraisal and valuation; trees and the law; commercial use of pesticide injections and air spade; nutrient management; and special management situations for trees & landscapes. (Prereq: LNDC1131)   **2 cr**

LNDC1141   NURSERY PROPAGATION AND PRODUCTION

This course is designed to give the student a fundamental understanding of the production process of the nursery industry. Labs will involve sexual and asexual propagation, which include commercially accepted methods of seed propagation; division, cuttings, layering, grafting and tissue culture. (Prereq: None) **3 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. Students will examine ways to manage the pests by chemical means or natural methods. (Prereq: None)   **3 cr**

LNDC1160   GREENHOUSE OPERATION AND MANAGEMENT

This course is designed to give the student an understanding of the greenhouse industry, greenhouse structures, greenhouse controlled environments, and application of specialized greenhouse equipment. (Prereq: None)   **2 cr**

LNDC1166   GREENHOUSE CROP PRODUCTION - FALL

This course is designed to give the student an understanding of commercial greenhouse crop production. Crops to be grown are chrysanthemums, poinsettias, and other minor crops. Marketing will be included, with an emphasis to actually selling the poinsettia crop grown by the students. (Prereq: None)   **3 cr**

LNDC1176   GREENHOUSE CROP PRODUCTION - WINTER

This course is designed to give the student an understanding of the production, culture and marketing of winter floriculture crops. Special emphasis will be given to Easter lilies, geraniums, and other minor crops. The fundamentals of hydroponics will also be covered in this class. (Prereq: None)   **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)   **4 cr**

LNDC1202   HERBACEOUS PLANTS I

This course is designed to give the student a understanding of herbaceous plants. Students will learn cultural needs of plants, pest problems, bloom period, and design qualities of those plants in the landscape. Included in the plant study are annuals, perennials, ferns, vines, and groundcovers. (Prereq: None)   **4 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) **2 cr**

LNDC1220   INTEGRATED PEST MANAGEMENT

This course is a study of the insect and disease problems that affect greenhouse crops, nursery crops and woody plants in the landscape. Management of environments, cultural practices and use of chemicals will be covered. This is a preparatory study for taking the Minnesota Department of Agriculture Pesticide applicators license test for categories A/E. (Prereq: None)   **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)   **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)   **2 cr**

LNDC1242   PLANT BIOLOGY

This course is designed as an overview of the taxonomic and structural characteristics of higher plants. An understanding of plant anatomy, how plants function and grow will be discussed. A lab will be held once a week to give hands on activities with regards to plant structure. (Prereq: None)   **4 cr**

LNDC1250   BEDDING PLANT PRODUCTION

This course is designed to introduce the student to cultural schedules, growing techniques, and profitable markets for herbaceous plants. Emphasis will be placed on spring bedding plants. The student will grow bedding plants and market them to the public during the spring sale held in May. (Prereq: None)   **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)
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)
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)   **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 different types of retaining walls, pavers, concrete, ponds and stonework.
(Prereq: LNDC2110)   **4 cr**

LNDC2131   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)   **3 cr**

LNDC2150   INTRODUCTION TO BASIC TREE CLIMBING

This course is a continuation of Arboriculture I with emphasis on tree care via rope and saddle climbing. Specialized topics and practices to include: climbing safety, climbing equipment, familiarity with ropes and knots, throw line, foot locking, mechanics of climbing and moving through trees via rope & saddle. Arboriculture I & II can prepare students for the International Society of Arboriculture (ISA) Tree Worker Certification, administered by the MN Society of Arboriculture (MSA). Other advanced arboriculture topics included.
(Prereq: LNDC1131)   **2 cr**

LNDC2155   TREE CLIMBING II - ADVANCED CLIMBING TECHNIQUES AND METHODS

This course is a continuation of Into to Tree Climbing with emphasis on tree care via rope and saddle climbing. Specialized topics and practices to include: An overview of Into to Basic Tree Climbing, advanced hitches and knots, progressive equipment and techniques, line placement and tree entry, limb walking, pruning techniques, aerial rescue, electrical hazard awareness, and basic rigging.
(Prereq: LNDC1130 and LNDC2150)   **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)   **4 cr**

LNDC2171 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: LNDC2160)   **3 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: LNDC1202 and LNDC2160)   **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)   **2 cr**

LNDC2220 TURF CULTURE AND MANAGEMENT

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)   **3 cr**

LNDC2241 LANDSCAPE EQUIPMENT OPERATION

This course is designed to give students hands-on experience with various types of equipment used in the Landscape/Horticulture industry. Focus will be given to safety, maintenance and the proper operation of equipment such as: skid steer loaders, 1 ton truck and trailer, backhoe, tree spade, workman, chainsaws, wood chipper, lawn mowers and various other types of equipment. (Prereq: None)   **3 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: Must be a second year student to enroll in this course)   **2 cr**

LNDC2261 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)   **3 cr**

LNDC2271 LANDSCAPE COMPUTER DESIGN AND APPLICATIONS I

This course is designed to introduce the student to application of the computer in landscape drafting and plan development. The latest Dynascapes CAD software is used. Students will implement the computer to create designs and produce completed drawings.
(Prereq: CPLT1000)   **3 cr**

LNDC2280 LANDSCAPE COMPUTER DESIGN AND APPLICATIONS II

This course is a continuation of Landscape Computer Design and Applications I. The students will prepare complete landscape plans and working drawings. The latest Dynascapes CAD software is used. Students will produce material lists, quantity takeoffs and estimates using various computer programs.
(Prereq: LNDC2271)   **3 cr**

LNDC2290 DYNASCAPES TRAINING FOR THE GREEN INDUSTRY

This course is designed for the industry experienced designer. The course will give the student the required skills to become comfortable and proficient with software. Basic computer knowledge is required.
(Prereq: None)   **2 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)   **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)   **1-4 cr**

LNDC2341   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)   **3 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)   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)   **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)   **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)   **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)   **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)   **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 or MACH1205)   **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)   **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 or MACH1205)   **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)   **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)   **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)
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)   **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)   **3 cr**

MACH2400 CNC SETUP AND OPERATION

This course will expose students to CNC machines. The student will be introduced to safety procedures, setup, and operation of various types of CNC machines. (Prereq: CNC Operators Certificate or equivalent industry experience)   **3 cr**

MACH2406 CNC PROGRAMMING

This course will introduce the student to computer numerical control machine tools. CNC programming, setup, and operation will be studied. Milling and turning programs will be developed and examined. (Prereq: None)   **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)   **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)   **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)   **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: MATH1011) **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)   **3 cr**

MACH2435 CNC TURNING CENTERS

This course is designed to introduce the student to CNC turning centers. Programming, tooling, setup, and operation of CNC turning centers will be emphasized. (Prereq: MACH2400 or equivalent industry experience)   **3 cr**

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) **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)   **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, setup, and operation of traveling wire and sinker EDM machines. (Prereq: CNC Operators Certificate or equivalent industry experience)   **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)   **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) **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)   **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) **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)   **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 setup 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)   **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 setup 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)   **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. Setup 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)   **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)   **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)   **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)   **3 cr**

MATH0900   FUNDAMENTALS OF MATHEMATICS

This course applies basic arithmetic skills of whole numbers, fractions, decimals, ratios, proportion and percents, with applied problems. (Prereq: None)   **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)   **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)   **2 cr**

MATH1011   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)   **3 cr**

MATH1020   GEOMETRY AND TRIG.

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: MATH1011 or equivalent)   **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 MATH1011)   **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)   **3 cr**

MATH2150   INTRODUCTION TO STATISTICS

This is an introductory course in descriptive statistics, probability, and inferential statistics topics include statistical theory and experimental design, data analysis, measures of central tendency, measures of dispersion, basic probability, binomial and normal distributions, regression analysis and correlation, inference, and sampling methods. Additional topics may include chi-squared tests and analysis of variance. (Prereq: Qualifying score on CPT math assessment test OR MATH1031)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **3 cr**

METS1505   PRINCIPLES AND PRACTICES OF LEAN MANUFACTURING (LEAN TOOLS AND TECHNIQUES)
This course encompasses review and discussion of the major principles and practices of Lean manufacturing. Partial listing of Lean tools covered include: Visual Management, 5S, Problem Solving, Material Management, Kanban, Mistake Proofing, Kaizen, Value Stream Mapping, as well as other. 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 manufacturing with Lean to show subsequent results improvement. There will also be discussion on Lean program planning and implementation.   (Prereq: None)   **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)   **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 it relates to non-manufacturing areas of the organization. (Prereq: METS1505) **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) **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)   **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) **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)   **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) **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)   **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) **3 cr**

MGDP1225   QUARKXPRESS

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 set-up, 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)   **3 cr**

MGDP1226   QUARKXPRESS (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 set-up, 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)   **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)   **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)   **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. 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) **2 cr**

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 intermediate tools and techniques at the end of the course. (Prereq: MGDP1205 or concurrent and CPLT1200 or instructor approval) **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 intermediate tools and techniques at the end of the course. (Prereq: MGDP1205 or concurrent and CPLT1100 or instructor approval) **3 cr**

MGDP1265 XHTML

This course will introduce students to the basics of XHTML (the web markup language) and prepare them for more advanced studies. Students will learn XHTML from the ground up, beginning with solid HTML concepts. Standards-based instruction will stress designing for backward and forward compatibility, usability, and accessibility.

Students will develop and publish Web pages that include XHTML techniques while using tables, frames, and forms. (Prereq: CPLT1200) **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 copyright 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) **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 intergrate 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) **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 intergrate 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) **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 set-up and use, color application, type and paragraph formatting, graphic import, linking and wrapping features, drawing tools, and printing concerns. (Prereq: MGDP1205 or concurrent)   **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)   **3 cr**

MGDP1330   ADVANCED PAGE LAYOUT

This is an intermediate level of digital page layout designed to solidify concepts learned in the introductory page layout courses. This project-based course takes basic skills to the next level and focuses on production standards for using digital page layout, such as QuarkXPress and Adobe InDesign. 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)   **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)   **2 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)   **3 cr**

MGDP2020   PRINT MEDIA PRODUCTION

This advanced course introduces the concepts of creative advertising and digital production as applied to the newspaper and magazine industry. The learner will focus on the skills necessary to design, layout and produce ads, an advertising campaign and make it press ready. Students will produce computer comprehensives ready for portfolio, client presentation and preflight files ready for digital or offset printing. (Prereq: MGDP1205, MGDP1225 OR MGDP1310, MGDP1230, MGDP1235, MGDP1240, MGDP1300, MGDP1360, MGDP2010, MGDP2020 and MPRT1210 or instructor approval)   **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)   **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)   **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)　**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)　**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)　**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)　**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)
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)
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)　**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)　**3 cr**

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)
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)　**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)　**3 cr**

MHTT1300　INTRODUCTION 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)　**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)　**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) **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)   **3 cr**

MHTT1410   TRANSMISSION TECHNOLOGIES
This course is designed to give the student an understanding of operation , diagnosis, service and repair of medium and heavy-duty standard, automatic, and electronic truck transmissions. (Prereq: MHTT1001)   **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)   **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) **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) **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)   **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) **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)   **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)   **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)   **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) **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)   **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)   **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) **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) **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: Instructor approval) **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) **3 cr**

MMST2105 MOTORCYCLE TRANSMISSIONS AND CLUTCH SERVICE

This course will cover the theory and operation of motorcycle transmissions. (Prereq: MMST1130) **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) **3 cr**

MMST2115 MOTORCYCLE OVERHAUL

In this class the student will rebuild a motorcycle engine to factory specifications. (Prereq: MMST1140 and MMST2100) **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) **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) **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) **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) **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) **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) **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) **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) **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) **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) **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)   **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)   **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)   **3 cr**

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)   **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)   **3 cr**

MMST2195 SNOWMOBILE ENGINE OVERHAUL
In this course the student will rebuild a snowmobile engine to factory specifications. (Prereq: MMST1140)   **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)   **3 cr**

MMST2205 I/O TRANSOM SERVICE
The student will remove, repair, reinstall and adjust a stern drive unit to factory specifications. (Prereq: MMST1130)   **3 cr**

MMST2210 I/O ENGINE OVERHAUL
The student will remove, disassemble, diagnose, rebuild and reinstall a stern drive engine. (Prereq: MMST1140)   **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)   **3 cr**

MMST2220 PWC ELECTRICAL/IGNITION SERVICE
The student will diagnose, troubleshoot and repair personal watercraft electrical or ignition problems. (Prereq: MMST1115 and MMST1120) **3 cr**

MMST2225 PWC WATER PUMP SERVICE
The student will service and repair a water pump on a personal watercraft jet drive. (Prereq: None)   **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) **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 multimedia designer in the production of different types of multimedia. (Prereq: None)   **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)   **3 cr**

MMVP1511 PRODUCTION PLANNING
This course will introduce the student to the process of evaluating client needs and preparing written production documents. Students will learn script writing techniques for corporate video and multimedia productions. (Prereq: None)   **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. It includes the basics of file formats and input and output considerations for all types of media. (Prereq: None)   **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: MMVP1500 with a grade of C or better or instructor approval)   **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: MMVP1500 with a grade of C or better or instructor approval and MMVP1511 recommended)   **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: MMVP1500 with a grade of C or better or instructor approval)   **3 cr**

MMVP1551 DIGITAL IMAGE ENHANCEMENT
This course will introduce the student to the concept of electronic image enhancement . Students will study basic photography, composition, and lighting and will use digital cameras to create images for the computer. (Prereq: MGDP1230 or instructor approval)   **3 cr**

MMVP1560 AUDIO FOR MEDIA
This course will introduce the student to sound editing for use in video and multimedia projects. Audio software will be used to create loop-based audio, edit pre-made audio, and sync audio and video. This is not an audio recording class. (Prereq: None)   **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: MMVP1520 or MGDP1230 or instructor approval)   **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)   **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: MMVP1511 with a grade of C or better and MMVP1600 with a grade of C or better or instructor approval)   **4 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: MMVP1511 with a grade of C or better and MMVP1600 with a grade of C or better or instructor approval)   **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: MMVP1500 with a grade of C or better or instructor approval)   **3 cr**

MMVP2570 MEDIA AUTHORING
This course is designed for students who want to enhance their skills with Macromedia Director and learn DVD authoring. Students will create portfolio quality CD-ROMs and complete DVD authoring tutorials. (Prereq: MMVP1536 with a grade of C or better or instructor approval and MDGP1230 recommended)   **4 cr**

MMVP2600 DIGITAL POST PRODUCTION

In this advanced course students will build on existing non-linear editing skills. Final Cut Pro, and DVD Studio Pro 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: MMVP1600 with a grade of C or better or instructor approval) **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: MMVP1511 with a grade of C or better and MMVP1600 with a grade of C or better or instructor approval) **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 with a grade of C or better or instructor approval) **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: None) 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) **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) **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) **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) **3 cr**

MPRT1219 PREPRESS ESSENTIALS

This course establishes the basic processes, concepts and problem solving skills used printing industry prepress departments. Students in this class will learn file management, color trapping, basic imposition styles, file preflighting and font management processes used in today's modern printing prepress departments. 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: MGDP1225) **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) **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)   **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)   **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)   **3 cr**

**MPRT1325   PRINTING MACHINERY
                   MAINTENANCE**

In this course the student will learn how to perform basic maintenance on machinery used in press and post-press areas of the printing industry. Students will learn preventative maintenance skills, such as lubrication, calibration, and basic adjustments on a variety of machinery. Trouble-shooting skills will also be developed to identify equipment components that need repair. Safety and attention to detail will be stressed.   (Prereq: Instructor approval) **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) **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)   **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)   **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)   **3 cr**

MPRT1380   VARIABLE DATA PRINTING

Variable Data Printing is a form of on-demand printing in which elements such as text, graphics and images may be changed from one printed piece to the next. Database information is integrated into the workflow allowing an infinite number of variations. In this course students will learn to use Darwin to develop and implement variable data printing ability through QuarkXPress. (Prereq: MGDP1220)   **3 cr**

MPRT1385   VARIABLE DATA PRINTING PROGRAMMING ESSENTIALS

This course is intended for a student planning to study computer programming in information systems for industry. The course content will introduce the student to programming language methods. Programming topics will include basic database structures, tables, records, fields, and delimiters. File analysis, merging, sorting, splitting, converting and file layout will be studied. (Prereq: CCIS1505 or instructor approval)   **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)   **3 cr**

MPRT2220   DIGITAL PRESS OPERATIONS

The future of the press room is in digital technology and printing. Students will learn and train on a state-of-the-art 4-color Heidelberg digital press. In depth studies centered around problem solving, trouble shooting and maintenance will prepare you for a job in the press room of the future. Students in this course will run full color sheetfed jobs and learn the total operation of the press. (Prereq: MGDP1225 and MPRT1345 or instructor approval)   **3 cr**

MPRT2250   ADVANCED BINDERY/FINISHING OPERATIONS

In this course the student will learn advanced bindery and finishing skills, using hands-on training, with emphasis on folding and cutting operations. Advanced folding techniques will be developed using MBO computerized state-of-the-art folding equipment. Students will learn strategies for storing cutting routines using a computerized programmable paper cutter. Students will produce complex folds and incorporate the use of scoring, perforating, and slitting. Job planning, problem-solving, and quality control will all be stressed. (Prereq: MPRT1250 or instructor approval)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **2 cr**

NURS1103   FOUNDATIONS I

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. ENGL2121, 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; current, unrestricted criminal background study)   **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 infection control and basic concepts of nutrition are also included in the course. (Prereq: High School diploma or GED or concurrently enrolled under the PSEOP. ENGL2121 or concurrent or qualifying score on CPT reading and writing assessment test, or equivalent)   **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. ENGL2121 or concurrent or qualifying score on CPT reading and writing assessment test, or equivalent)   **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, campus resources, diversity and its impact on nursing, communication techniques and opportunities, time and stress management, introduction to the Minnesota Board of Nursing. (Prereq: High School diploma or GED. ENGL2121 or concurrent or qualifying score on CPT reading and writing assessment test, or equivalent)   **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. ENGL2121, MATH1000, 8-hour CPR (Health Care Providers) or SSCI1020, NURS1001, NURS1111, NURS1120 and NURS1130. Prerequisite or concurrent: NURS1151, NURS1161 and NURS1191)   **4 cr**

NURS1143   INFECTION CONTROL

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. ENGL2121 or concurrent or qualifying score on CPT reading and writing assessment test, or equivalent)   **1 cr**

NURS1151   PHASES OF ADULTHOOD

This course will explore the theories of development and established growth patterns from young adulthood through late adulthood. Topics covered in this course include cognitive, psychosocial and physical development for each phase. The human response to grief, 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. ENGL2121, MATH1000, 8-hour CPR (Health Care Providers) or SSCI1020, NURS1001, NURS1111, NURS1120 and NURS1130. Prerequisite or concurrent: NURS1141, NURS1161 and NURS1191)   **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 lung and bowel sounds, CMS, nonpharmacologic pain management and apical heart rate. Oxygen administration, sterile technique, tracheostomy care, 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. ENGL2121, MATH1000, 8-hour CPR (Health Care Providers) or SSCI1020, NURS1001, NURS1111, NURS1120 and NURS1130. Prerequisite or concurrent: NURS1141, NURS1151 and NURS1191)   **3 cr**

NURS1180   NUTRITION

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 complete a dietary evaluation. Food-related illnesses, consumer nutrition and trends as well as food regulatory agencies are included. (Prereq: High School diploma or GED. ENGL2121 or concurrent or qualifying score on CPT reading and writing assessment test, or equivalent)   **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. ENGL2121, MATH1000, 8-hour CPR (Health Care Provider) or SSCI1020, NURS1001 or equivalent, NURS1111, NURS1120 and NURS1130. Prerequisites or concurrent: NURS1141, NURS1151 and NURS1161)   **4 cr**

NURS1201   FOUNDATIONS II

This clinical course provides opportunity for the student to apply skills and nursing theory in an acute, sub-acute or rehabilitation 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. ENGL2121, 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, 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 and Physical Exam/Immunization records on school file; current unrestricted criminal background study)   **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: NURS1141, NURS1151, NURS1161 and NURS1191)   **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: NURS1103, NURS1201, NURS1221, and NURS1261)   **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 and medication administration. Practice and evaluation in a skills lab is required in preparation for clinical participation. (Prereq: High School diploma or GED. ENGL2121, MATH1000, NURS1001 or equivalent, NURS1111, NURS1120, NURS1130, NURS1141, NURS1151, NURS1161 and NURS1191. NURS1241 prerequisite or concurrent)   **3 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)   **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)   **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)   **2 cr**

NURS2400   CAPSTONE

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)   **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)   **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. In addition, students gain an understanding of the organization and complexity of the body and become familiar with the location and function of major body organs. Pharmacological drugs associated with the body systems will also be studied. (Prereq: None)   **4 cr**

OFCR1316   MEDICAL OFFICE PROCEDURES

This is an introductory course to medical office procedures. It will include telephone etiquette, customer service, appointment scheduling, and medical records management. (Prereq: OFCR1301 and CPLT1005 or concurrent)   **3 cr**

OFCR1331   MEDICAL TRANSCRIPTION I

This course introduces 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; a 45 Net Words Per Minute typing speed as documented on a 5-minute timed writing)   **4 cr**

OFCR1335   MEDICAL CODING FUNDAMENTALS

This course includes an overview of CPT-4 procedure coding, and ICD-9-CM diagnostic and procedure coding systems. This course will cover the principles of complete and accurate coding for both statistical reporting and insurance billing. Exercises and case studies will be used to demonstrate requirements for accurate coding. (Prereq: OFCR1301 or instructor approval)   **4 cr**

OFCR1340   MEDICAL OFFICE MANAGEMENT

This is an introductory course to medical office management. It includes insurance and reimbursement methodologies, legal and ethical issues, personnel management, practice finances management, compliance, safety, and marketing. (Prereq: OFCR1316. ACCT1000 and OFCR1335 prerequisite or taken concurrently)   **3 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 55 Net Words Per Minute typing speed as documented on a 5-minute timed writing) **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)
1-6 cr

PHIL2100   CRITICAL THINKING
This course is an introduction to logic, the study of reasoning. We will investigate what an 'argument' is in logic, which different forms of argument are good ones, which are not, and which rules we should follow in constructing and evaluating arguments. We will also master some useful problem-solving methodologies and apply them to analogy, lateral thinking, and deductive logic puzzles of relevance to the workplace. (Prereq: Qualifying score on writing assessment test OR ENGL1021 or ENGL1026. Basic computer literacy skills required) **3 cr**

PHIL2200   ETHICS
This course is an introduction to ethics and moral philosophy, the branch of philosophy which concerns right conduct and how we ought to live. We explore the nature of ethics, important challenges to ethics as traditionally construed by philosophers, and several ethical theories prominent in the history of philosophy. Throughout our inquiry, we will have occasion to discuss various contemporary moral problems and see how ethical theories have addressed them. (Prereq: Qualifying score on writing assessment test OR ENGL1021 or ENGL1026. Basic computer literacy skills required) **3 cr**

PHIL2300   BUSINESS ETHICS
This course aims to introduce students to important ethical issues that arise in business while simultaneously introducing them to the major branches of ethical theory. Using our mastery of moral theories and concepts, students will analyze specific issues in business ethics and learn the philosophical skills needed to develop and defend their own moral arguments. We will also focus on analyzing cases and professional codes of ethics. (Prereq: Qualifying score on writing assessment test OR ENGL1021 or ENGL1026. Basic computer literacy skills required) **4 cr**

PHIL2400   MEDICAL ETHICS
This course aims to introduce students to some of the fundamental issues in medical ethics. This course will be of significant interest to those in the nursing and dental fields, as well as those interested in contemporary medical issues. This course will also introduce students to the major branches of moral theory. Using our mastery of moral theories and concepts, students will analyze specific issues in medical ethics and learn the philosophical skills needed to develop and defend our own moral arguments. We will also focus on analyzing cases and professional codes of ethics. Because it's impossible to comprehensively cover all topics in medical ethics, as we focus on a sampling of topics we will also focus on distinguishing between different methodological approaches to ethical problems arising in the medical context. It's hoped that students, as a result, will acquire the skills necessary to investigate unfamiliar topics and issues. (Prereq: Qualifying score on writing assessment test OR ENGL1021 or ENGL1026. Basic computer literacy skills required) **4 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)
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)
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)   **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, set-up 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)   **3 cr**

PLST2017   EXTRUSION MOLDING PROCESSES II

This is a continuation of Extrusion Molding Processes I and is designed to introduce the student to Compounding with the Twin Screw Extruder. Content includes Basic Operations to Advanced Troubleshooting. Content includes Plastics Drying Technology Operation, Control, and Maintenance. This course utilizes Paulson Training Program's interactive CD-ROM based courseware. Set-up, tear-down, operation and troubleshooting of several extrusion molding dies, down stream equipment, and plastics molding materials to produce a quality product will be emphasized. (Prereq: PLST2011)   **4 cr**

PLST2128   INJECTION MOLDING PROCESS I

This course is designed to introduce the student to Basic Injection Molding machine operations and operating controls. Content includes Plastics Drying Technology Operation, Control, and Maintenance. Content includes SkillBuilder, a CD-ROM based interactive lab simulator for Basic Injection Molding Technology. Content includes Advanced Injection Molding with emphasis on the relationship between machine controls, plastics behavior during molding and finished part properties. Content includes Optimizing Machine Control Settings 1, 2, 3 and 4. This course utilizes Paulson Training Programs' interactive CD-ROM based courseware. Injection Molding Essentials is designed for anyone new or involved in injection molding. It provides a solid foundation for understanding the injection molding process and the critical practice of good production techniques. This course utilizes RJG, Inc. 'Injection Molding Essentials' Training Manual. (Prereq: None)
4 cr

PLST2138   INJECTION MOLDING PROCESS II

This course is a continuation of Injection Molding Process I and is designed to introduce the student to ten (10) lessons of Understanding Materials for Profitable Molding. Each lesson describes the properties and molding characteristics that will improve processing of that material. Lessons include PC, PP, PE, PA, ABS, PS, PMMA, POM, PBT, and TPE. Content includes SimTech, an injection molding machine simulator. Content includes efficient mold setting, a two-session program designed to instruct personnel on proper mold storage, installation, start-up, safety and shut-down procedures. This course utilizes Paulson Training Programs interactive CD-ROM based courseware. Hands on training in set-up, tear-down, operation and troubleshooting of several molds. Producing a quality product will be emphasized. (Prereq: PLST2128)   **4 cr**

PLST2143   INJECTION MOLDING PROCESS III

This course is a continuation of Injection Molding II and is designed to introduce the student to injection molded part problems and solutions. 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 of 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 Paulson Training Programs' interactive CD-ROM based courseware. Content includes set-up, operation and troubleshooting of several types of Injection Molding Machines, Molds and Materials to produce quality plastics molded parts. Optimization of setting and started the mold will be emphasized. (Prereq: PLST2138)   **4 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)   **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)   **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)   **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)   **3 cr**

PRPO1051   AMBIENT LIGHTING CONTROLS

This course will introduce the student to both the practical and theoretical application of controlling the photographer's most important tool, light. The course will deal with, through the use of light modifying devices and the hand held light meter, how to control the direction, quantity, quality, ratio and color of light for both outdoor (natural) and indoor (existing) light. (Prereq: None)   **3 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)   **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)   **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)   **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)   **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)   **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)   **3 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) **3 cr**

PRPO2100   ADVANCED DIGITAL DARKROOM

This course will improve the student's skills in the digital lab. Students will deal with various digital capture devices, importing and manipulation in the computer, profiling devices, naming conventions, helper programs and determining what method of output is best for their images. (Prereq: PROP1400)   **3 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) **3 cr**

PRPO2400   INTERMEDIATE 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: PRPO1240)   **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) **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) **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) **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)   **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)   **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)   **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)   **3 cr**

PRPO2530   ADVANCED 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: PRPO2400)   **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)   **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)   **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)   **1-8 cr**

PRPO2820   PROFESSIONAL PHOTOGRAPHY PORTFOLIO

This is the keystone course in the Professional Photography Program. All other courses in the program 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 chosen career area. The final portion of the course is devoted to the portfolio exhibits and a comprehensive exam covering the graduate's gained knowledge over the course of the program. (Prereq: A minimum of 40 credits earned in the program or instructor approval)   **3 cr**

RPMG1105   MARKETING AND LEASING THE MULTI-UNIT 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 units 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)   **4 cr**

RPMG1205   BUDGETING AND FINANCIAL ADMINISTRATION OF MULTI-UNIT 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)   **4 cr**

RPMG1305   MANAGING THE GROUND AND PHYSICAL PLANT OF MULTI-UNIT PROPERTY

This course provides an overview of maintaining the grounds, building and maintenance systems encountered in multi-unit properties. 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, roofing, safety and security, risk management and maintenance record keeping. (Prereq: None)   **4 cr**

RPMG1405   MANAGING PEOPLE IN THE PROPERTY MANAGEMENT INDUSTRY

This course will look at the importance of self time management, employee relations, customer service and resident retention in the property management 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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)   **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)
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)   **1 cr**

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)   **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. Basic computer literacy skills required)   **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. 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. Basic computer literacy skills required)   **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)   **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. Basic computer literacy skills required)   **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 setup,
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)   **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)   **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 setup, 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)   **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 and WLDG1181 or instructor
approval)   **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)   **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)   **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)   **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)   **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
and WLDG1181 or instructor approval)   **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)   **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)   **3 cr**

WLDG1310   SHIELDED METAL ARC WELDING I

This course covers shielded metal arc welding (STIK) 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)   **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 and WLDG1181) **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)   **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)   **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) **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 and WLDG1181)   **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)   **3 cr**

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