Mission
Northwestern Michigan College provides lifelong learning opportunities to our communities.

Institutional Accreditation
Accredited by the Higher Learning Commission and a member of the North Central Association.
30 N. LaSalle, Suite 2400
Chicago, IL 60602
(800) 621-7440
www.ncahigherlearningcommission.org

Program Accreditations
• Accreditation Commission for Education in Nursing
• American Culinary Federation
• American Dental Association Commission on Dental Accreditation
• Bureau of Automotive Regulation–State of Michigan
• Federal Aviation Administration/Federal Aviation Regulation
  Part 141 approved
• International Accreditation by United States Coast Guard
• International Accreditation by the United States Maritime Administration
• Michigan Board of Nursing
• Michigan Commission on Law Enforcement Standards
• Michigan Corrections Officers Training Council

Non-Discrimination Policy
NMC does not discriminate in admission, campus activities, education, employment, housing, public accommodation, or public service on the basis of age, color, disability, handicap, height, marital status, national origin, political affiliation, race, religion, gender, sexual orientation, veteran’s status, or weight. No act of retaliation shall occur to any person making a charge, filing a complaint, testifying or participating in any discrimination investigation or proceeding.

This catalog is in effect starting Fall Semester 2015 through Summer Semester 2016. The contents of this catalog are accurate at the time of publishing, March 2015. For the most current information, consult the website: www.nmc.edu. The NMC Board of Trustees reserves the right to make changes without notice.
Programs & Areas of Study Index

Accounting .......................................................... 15, 19, 55
Administrative Support Specialist ......................... 15, 19
Anthropology ....................................................... 15, 56
Art/Fine Arts ......................................................... 15, 56
Astronomy .................................................................. 15, 57
Audio Technology .................................................. 15, 20, 61
Automotive
  Automotive Service Technology ............................ 21, 59
  Electrical and Drivability Specialist ....................... 21, 59
  Hybrid Technology Specialist ............................... 22, 59
  Master Automotive Technician .............................. 22, 59
  Under Car Specialist ........................................... 22, 59
Aviation ................................................................... 23, 62
Biology .................................................................... 15, 64
Bridge Learning Community .................................... 23
Business Administration ......................................... 15, 24, 67
Business Administration Online .............................. 24, 67
Chemistry .................................................................. 15, 69
Communications .................................................... 15, 75
Computer Studies
  CIT Developer ....................................................... 25, 70
  CIT Infrastructure ................................................. 26, 70
  Computer Support Specialist Certificate ................. 27, 70
  Developer I, III Certificates .................................. 25, 70
  Infrastructure Specialist I, II, III Certificates .......... 26-27, 69
  Office Applications Specialist Certificate ............... 27
  Web Developer I, II, III Certificates ....................... 29
Construction Technology
  Carpentry Technology .......................................... 30, 67
  Construction Technology Electives ......................... 32
  Construction Management Courses ....................... 75
  Electrical Technology ....................................... 30, 67
  Facilities Maintenance ......................................... 30, 67
  HVAC/R Technology ........................................... 30, 67
  Programmable Logic Controllers ......................... 31, 67
  Renewable Energy Technology - Electrical ............. 31, 67
  Renewable Energy Technology - HVAC ................. 32, 67
Criminal Justice ...................................................... 15, 74
Culinary Arts .......................................................... 33, 76
Dance ..................................................................... 15, 78
Dental Assistant ...................................................... 34-35
Early Childhood Education and Care ...................... 16, 35-36, 68
Economics ............................................................. 16, 78
Education ............................................................... 16, 79
Engineering ............................................................ 16, 80
English .................................................................... 16, 82
Engineering Technology ........................................ 16, 37
Entrepreneurship .................................................... 38
Environmental Science .......................................... 16, 86
Freshwater Studies ................................................ 16, 39, 123
Geography ................................................................ 16, 88
Geology ................................................................... 17
History .................................................................... 17, 94
Law Enforcement .................................................... 19, 40
Liberal Arts/Science ................................................. 17
Manufacturing Technology ..................................... 20, 82
Marine Technology .................................................. 41
Maritime .................................................................. 42
  Deck Officer ......................................................... 43, 97
  Engineering Officer ............................................. 43, 101
  Great Lakes Maritime Academy ......................... 43
  Power Plant Facilities Operator ....................... 44
Mathematics ........................................................... 17, 104
Music ..................................................................... 17, 106
Nursing
  Associate Degree .................................................. 45
  LPN to ADN Completion ........................................ 46
  Practical ............................................................... 48
Philosophy & Religion .............................................. 17, 115
Physical Education .................................................. 17, 113
Physics .................................................................... 17, 115
Plant Science, Applied ........................................... 17, 49
Political Science ...................................................... 18, 116
Pre-Law ................................................................. 18
Pre-Med ................................................................. 18
Pre-Vet ................................................................. 18
Psychology ............................................................ 18, 60
Respiratory Therapy ................................................ 14, 50
Social Work ............................................................ 18, 60
Sociology ............................................................... 18, 118
Technical Management Administration .................. 11, 50
Visual Communications
  Creative Management in Art Direction .................... 51, 120
  Visual Communications ..................................... 51, 120
Welding Technology ................................................. 52, 122
World Languages
  American Sign Language ...................................... 18, 58
  French ................................................................. 18, 87
  Spanish ............................................................... 18, 119

www.nmc.edu
2015-2016 Academic Calendar

FALL SEMESTER 2015
Registration Begins: March 11, 2015
Tuition Payment Due: August 4
Classes Begin: August 29
College Closed (Labor Day holiday observed): Sept. 5-7
Classes Cancelled: October 20
College Closed (Thanksgiving holiday observed): Nov. 25 (after 5 p.m.) - Nov. 29
Classes End: Dec. 19
Grades Available: Dec. 23
College Closed (combined winter holidays observed): Dec. 24-25 - Jan 1, 2016

SPRING SEMESTER 2016
Registration Begins: Oct. 21, 2015
Tuition Payment Due: December 10, 2015
Classes Begin: January 8
College Closed: March 25-27
Spring Break (No Classes): March 28-April 3
Honors Convocation: April 29
Commencement: April 30
Classes End: April 30
Grades Available: May 4

SUMMER SESSION 2016
Registration Begins: Oct. 21, 2015
Tuition Payment Due: April 26, 2016
Classes Begin: May 7
NMC BBQ: May 22
College Closed (Memorial Day holiday observed): May 28-30
College Closed (Independence Day holiday observed): July 2-4
Classes End: August 8
Grades Available: August 11

Table of Contents

Programs & Areas of Study Index ........................................ 1
Welcome ........................................................................... 3
Program Information.......................................................... 4
General Education............................................................. 5
Degrees & Certificates......................................................... 5
Group 1 & 2 Courses ....................................................... 6, 12-13
Degree Requirements ...................................................... 7-11
Course Learning Options ..................................................14
Transfer Options (Areas of Study) .....................................15-18
Occupational Specialty Programs ....................................19-52
Course Descriptions ......................................................... 53
Course Prefixes by Academic Area ................................. 54
Reading a Course Description ......................................... 55
Course Descriptions ....................................................... 55-125
Student Handbook ......................................................... 126
Student Rights & Responsibilities ................................... 127
Academic Polices .............................................................. 127
Inclement Weather Policy ............................................... 129
Harassment Policy ......................................................... 129
Right to Know, Safety and Security .............................. 130

NMC. Find it here.
You’re going places. We’ll help you get there.

Northwestern Michigan College didn’t get to be the oldest community college in Michigan by staying put. At NMC, our programs are always evolving to help prepare our learners for the real world.¹

At NMC your classroom and laboratory can be Grand Traverse Bay, the sky, the woods…or a more traditional classroom and laboratory. It might be around the block, or halfway around the world. Wherever it is, it will feature state-of-the-art equipment and world-class instruction.

Still, some things have stayed the same for more than 60 years:
• You’re going to get a great education²
• You’re going to get personal attention from outstanding faculty who care about your success³
• You’re going to be able to afford it⁴

Footnotes:
1. More than 50 programs of study, 10 percent new in the past five years.
2. More than 90 percent of NMC graduates and transfer students consistently report accomplishing their educational goal and say that NMC is a good value for the money.
3. Average class size is 20.
4. NMC’s in-district tuition is less than half that of a public four-year university.

Welcome to NMC. Find it here.

“NMC’s faculty and staff take pride in seeing students achieve their goals. Whatever you’re looking for, we are dedicated to helping make sure you find it here.”

Timothy J. Nelson, President
General Education

Philosophy
General Education at Northwestern Michigan College promotes the acquisition of knowledge, skills, and attitudes needed to function effectively in a changing world. This fosters intellectual curiosity, essential to lifelong learning.

Outcomes
To ensure students experience the benefits of our philosophy of general education, the faculty of NMC commits to instilling these practices throughout the curriculum.

COMMUNICATION: Students will practice effective communication with an awareness of audience and sense of purpose.

CRITICAL THINKING: Students will skillfully conceptualize, apply, analyze, synthesize, and evaluate information gathered from observation, experience, reflection, reasoning, or communication.

QUANTITATIVE REASONING: Students will accurately use numbers, symbols, measurements, properties, and the relationships of quantities to make sound decisions, judgments, and/or predictions.

Assessment
General Education outcomes are measured in several ways:
- Each year faculty members in designated courses submit selected student work to the Office of Research, Planning & Effectiveness. Faculty teams assess the level of achievement represented by the student work.
- Graduates are surveyed annually and are asked to provide their perceptions of achieving the outcomes.

The Curriculum Committee is charged with using the results of assessment to make curricular improvements.

Degrees & Certificates
NMC students may select from several educational options. Associate degrees, bachelor degrees, and certificates are awarded to those students who complete a prescribed set of courses in specific areas of study. Many programs, especially in occupational areas, also lead to additional career licenses or certifications. Maritime programs require four years of full-time study, including summer sessions, and result in a bachelor’s degree at NMC. Associate degree programs generally take two years of full-time study to complete. Certificate programs range 15-45 credits.

NMC offers the following degree and certificate options:
- Certificate of Achievement Programs
- Associate in Applied Science (AAS)
- Associate Degree in Nursing (ADN)
- Associate in General Studies (AGS)
- Associate in Science and Arts (ASA)
- Bachelor of Science in Maritime Technology (BS)

Earning a Second Associate Degree
Students may earn additional degrees at NMC. A minimum of 15 earned hours (credits) shall be earned from NMC in addition to the required credits for the previous degree.

Students seeking an additional associate degree shall be governed by the following stipulations:
- Students may earn only one Associate in Science and Arts degree
- Students may earn the Associate in General Studies degree only as their first associate degree with the exception of students who are enrolled in the AGS/Pre-ADN, AGS/Pre-Dental or AGS/Pre-Surgical Tech program
- Program requirements for the additional degree will be based on the catalog that is in effect when the student officially switches to the new program
- Previous credits will be evaluated by the Records Office for transfer to the additional degree as applicable
- This policy does not apply to certificates

Reverse Transfer
A transfer student may complete an associate’s degree concurrently with his or her pursuit of a bachelor’s degree. This process is called reverse transfer. It enables NMC students who transfer to a four-year institution before completing an associate’s degree to use coursework and credits earned at the transfer school to fulfill degree requirements at NMC.

Students enrolled at one of NMC’s Reverse Transfer partners should submit the appropriate Reverse Transfer Release form to the partner school’s Office of the Registrar. Students enrolled at non-partner schools may also reverse transfer credits. To begin the process, submit a transcript from the four-year institution to NMC. After review, NMC will inform students of their successful degree completion, or whether they have unsatisfied degree requirements remaining.

For more information, go to www.nmc.edu/student-services/advising-center/reverse-transfer.html
Cultural Perspective/Diversity
Students will evaluate substantial connections between the world views, power structures, and experiences of multiple global cultures historically or in contemporary contexts.

In order for NMC graduates to engage as educated and informed citizens of a diverse society, students pursuing the ASA and AGS degrees are required to take one Cultural Perspective/Diversity course. Courses are listed on page 12-13.

Certificate Requirements
Certificate Programs typically include specialty courses and may include some core education requirements. In most cases, they are designed for concentrated proficiency in specialized areas. Certificates may range from 15 to 59 credit hours as established by individual program areas and/or the Curriculum Committee. Many certificate courses may apply toward an associate degree.

Certificate Program requirements include:
1. A specified group of credit hours in an area of specialization, as determined by the appropriate NMC academic area. These three levels are possible:
   • Level I: A minimum of 15 credits in a specialty area;
   • Level II: A minimum of 30 credits in a specialty area;
   • Level III: A minimum of 45 credits in a specialty area.
2. A minimum cumulative grade point average of 2.0. Higher GPA standards may be required for specific courses within individual academic areas.
3. Level I and II certificate programs require that a minimum of 8 credit hours be completed at NMC (this may be waived in extenuating circumstances; contact the registrar). Level III certificate programs require that a minimum of 12 credit hours be completed at NMC (this may be waived in extenuating circumstances; contact the registrar).
4. Competency testing by the responsible academic area if the course work was not completed at NMC.

*Competency credit: Students with competency in a specific area should consult with their program coordinator for possible testing and/or credit.

Certificate programs are listed in the Occupational Specialty Programs section of this catalog.

General Education Certificates
NMC will give recognition to students who have completed the General Education Requirements for their program of study. Students will receive a General Studies Certificate when all general education coursework is successfully completed for the AAS degree at NMC. A Science and Arts Certificate will be granted upon successful completion of the MTA or MACRAO plus math requirements. These are considered “milestones” in the student’s program objective and are recognized as such on the academic transcript. See page 14 for these requirements.

Group 1 & 2 Courses
Group 1 General Education courses are designed to enhance skills and knowledge for students to succeed in academic, career and life goals. Students pursuing a two-year degree will need to fulfill specific general education requirements by selecting courses from Group 1 based on the degree requirements listed on the following pages. The Group 1 courses are listed on pages 12-13 of this catalog.

Group 2 courses are all remaining 100-level courses or above which may fulfill occupational specialty program requirements, major area requirements, and elective requirements for degree and certificate programs.
Degree Requirements

Associate in Science & Arts Degree (ASA)

The Associate in Science and Arts degree is generally pursued by students who are planning to transfer to a four-year college or university to complete a baccalaureate degree. Students who want to explore the curriculum also frequently pursue the ASA degree.

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communications</strong></td>
<td>6 credits minimum</td>
</tr>
<tr>
<td>ENG 111 and ENG 112 English Composition</td>
<td></td>
</tr>
<tr>
<td><strong>Humanities</strong></td>
<td>6 credits minimum</td>
</tr>
<tr>
<td>Two Group 1 classes from different departments: art, history, humanities, literature, music, philosophy, second-year foreign language</td>
<td></td>
</tr>
<tr>
<td><strong>Mathematics</strong></td>
<td>3 credits minimum</td>
</tr>
<tr>
<td>One Group 1 mathematics class, MTH 120 or higher, excluding MTH 205 and MTH 206</td>
<td></td>
</tr>
<tr>
<td><strong>Science</strong></td>
<td>6 credits minimum</td>
</tr>
<tr>
<td>Two Group 1 classes from different departments: astronomy, biology, chemistry, environmental science, physics. One class must include a lecture/lab</td>
<td></td>
</tr>
<tr>
<td><strong>Social Science</strong></td>
<td>6 credits minimum</td>
</tr>
<tr>
<td>Two Group 1 classes from different departments: anthropology, economics, geography, political science, psychology, sociology</td>
<td></td>
</tr>
</tbody>
</table>

**Electives:**
A combination of credits from Group 1 or Group 2 to equal the minimum earned credits for the degree.

A list of courses in Group 1 and 2 begins on page 12.

Completing the General Education Requirements of 30 credits will qualify for the Michigan Transfer Agreement (MTA). See page 14 for further information.

**OTHER REQUIREMENTS**
- Complete a minimum of 60 credit hours with a 2.0 or higher cumulative grade point average.
- Complete one course designated as Cultural Perspective/Diversity. Courses are listed on page 14.
- Complete a minimum 15 of the 60 credits through NMC classes.

**NOTES**
- A maximum of two physical education credits, two professional development seminar credits, and four Academic Service Learning Internship credits may be used toward a degree.
- Courses with numbers below 100 level do not count toward graduation but the grades do count toward your cumulative GPA. They may be prerequisites for other courses needed to complete degree or certificate requirements and may add to the total number of credits taken. Review course prerequisites carefully.
- To count toward graduation, a course must be completed with a grade of 1.0 or higher, unless otherwise stated.
To apply, use the three-digit NMC Code on your admissions application.

**Associate in General Studies Degree (AGS)**

The Associate in General Studies Degree is designed for students interested in obtaining a degree that can be customized based on varying areas of interest.

**Note:** This degree is not designed to meet the needs of the transfer student. Consult an advisor to discuss your educational goals and determine if this degree is right for you.

**Communications** 6-8 credits

ENG 111 English Composition
and either BUS 231, ENG 112, or ENG 220.

**Humanities** 3 credits

3 credits of a **Group 1** Humanities course.

**Science** 3-4 credits

3-4 credits of a **Group 1** Science lecture/lab course.

**Social Science** 3 credits

3 credits of a **Group 1** Social Science course.

| **Total Degree Credits:** Minimum of 60 |

**MATH COMPETENCY**

* Math Competency may be fulfilled in one of two ways:
  - COMPASS placement into MTH 111 or higher, or
  - Successful completion of MTH 23 (or MTH 23A and MTH 23B) with a grade of 2.0 or higher.

**NOTES**

- A maximum of two physical education credits, two professional development seminar credits, and four Academic Service Learning Internship credits may be used toward a degree.
- Courses with numbers below 100 level do not count toward graduation but the grades do count toward your cumulative GPA. They may be prerequisites for other courses needed to complete degree or certificate requirements and may add to the total number of credits taken. Review course prerequisites carefully.
- To count toward graduation, a course must be completed with a grade of 1.0 or higher, unless otherwise stated.
## Associate in Applied Science Degree (AAS)

The Associate in Applied Science degree is generally pursued by those students who plan to enter the workforce following graduation from NMC. A career specialty emphasis is the dominant characteristic of the Applied Science Degree. View the list of specialty programs on pages 19-52. Although some students pursuing the AAS degree may transfer to a four-year college or university to pursue a baccalaureate degree, many AAS courses are not granted transfer equivalency credit at Michigan universities. Students considering the AAS degree who may wish to transfer should see an advisor.

### Communications

<table>
<thead>
<tr>
<th>6-8 credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 111 English Composition and either ENG 220, BUS 231, or ENG 112. (Program of Study may specify.)</td>
</tr>
</tbody>
</table>

### Humanities

<table>
<thead>
<tr>
<th>3 credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 credits of a Group 1 Humanities course. (Program of Study may specify.)</td>
</tr>
</tbody>
</table>

### Science

<table>
<thead>
<tr>
<th>3-4 credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-4 credits of a Group 1 Science lecture/lab course. (Program of Study may specify.)</td>
</tr>
</tbody>
</table>

### Social Science

<table>
<thead>
<tr>
<th>3 credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 credits of a Group 1 Social Science course. (Program of Study may specify.)</td>
</tr>
</tbody>
</table>

### Major Area Requirements

27 or more earned occupational specialty semester credits. See specific Programs of Study beginning on page 61.

Math Competency required.*

### A list of courses in Group 1 and 2 begins on page 12.

### MATH COMPETENCY

* Math Competency may be fulfilled in one of two ways:
  - COMPASS placement into MTH 111 or higher, or
  - Successful completion of MTH 23 (or MTH 23A and MTH 23B) with a grade of 2.0 or higher.

### OTHER REQUIREMENTS

- Complete at least 60 credit hours with a 2.0 or higher cumulative grade point average.
- Complete a minimum of 15 of the 60 credits through NMC classes.

### Total Degree Credits: Minimum of 60

### NOTES

- A maximum of two physical education credits, two professional development seminar credits, and four Academic Service Learning Internship credits may be used toward a degree.
- Courses with numbers below 100 level do not count toward graduation but the grades do count toward your cumulative GPA. They may be prerequisites for other courses needed to complete degree or certificate requirements and may add to the total number of credits taken. Review course prerequisites carefully.
- To count toward graduation, a course must be completed with a grade of 1.0 or higher, unless otherwise stated.
Associate Degree in Nursing (ADN)

The Associate Degree in Nursing program is generally pursued by those students who plan to enter the nursing workforce following graduation. After successful completion of this program, graduates take the National Council Licensure Examination (NCLEX-RN). With passing scores, graduates are awarded licensure as a Registered Nurse.

Some students pursuing the ADN degree may decide to transfer to a four-year college or university to pursue a baccalaureate degree. Students considering the ADN degree who may wish to transfer should see an advisor.

<table>
<thead>
<tr>
<th>Communications</th>
<th>6-8 credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 111 English Composition and ENG 112 English Composition.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Humanities</th>
<th>3 credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHL 202 Contemporary Ethical Dilemmas.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Science</th>
<th>11 credits</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Social Science</th>
<th>3 credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSY 101 Introduction to Psychology.</td>
<td></td>
</tr>
</tbody>
</table>

**Total Degree Credits: Minimum of 68-70**

**MATH COMPETENCY**
*Math Competency may be fulfilled in one of two ways:*
- COMPASS placement into MTH 121 or higher, (excluding MTH 205 and MTH 206) or
- Successful completion of MTH 111 with a grade of 2.0 or higher.

**OTHER REQUIREMENTS**
- Complete a minimum of 68-70 credit hours with a cumulative grade point average of 2.0. Complete each nursing course at 2.0 or higher.
- Complete a minimum of 16 degree credits through NMC classes.

**Major Area Requirements**
45 semester credit hours in HNR and HAH courses as listed in the Associate Degree in Nursing Program requirements.

Math Competency required.*

**Admission requirements are on page 45 of this catalog.**

**NOTES**
- A maximum of two physical education credits, two professional development seminar credits, and four Academic Service Learning Internship credits may be used toward a degree.
- Courses with numbers below 100 level do not count toward graduation but the grades do count toward your cumulative GPA. They may be prerequisites for other courses needed to complete degree or certificate requirements and may add to the total number of credits taken. Review course prerequisites carefully.
- To count toward graduation, a course must be completed with a grade of 1.0 or higher. Grades of 2.0 or higher are required for courses with the HNR prefix, CHM 101, ENG 111 and PSY 101. Grade point average of 2.5 or higher required for each of the courses in Anatomy and Physiology sequence (BIO 227, BIO 228).
Bachelor of Science in Maritime Technology (BS)

The Bachelor of Science in Maritime Technology (BS) is for students whose goal is to pursue a select professional field of study at the baccalaureate level. See page 41 for the Marine Technology program requirements and page 42 for the Maritime Deck Officer and Maritime Engineering Officer program requirements.

General Education Requirements

Minimum 30 Group 1 credits with at least a 2.0 grade for each course

Communications 6-8 credits

ENG 111 English Composition and either ENG 220 or ENG 112. (Program of Study will specify.)

Humanities 3 credits

3 credits of a Group 1 Humanities course. (Program of Study will specify.)

Science 4 credits

4 credits of a Group 1 Science lecture/lab course. (Program of Study will specify.)

Social Science 3 credits

3 credits of a Group 1 Social Science course. (Program of Study will specify.)

Major Area Requirements

See pages 41-44.

Math Competency required.*

Total Degree Credits: Minimum of 120

Math Competency

*Math Competency may be fulfilled in one of two ways:
  • COMPASS placement into MTH 121, or higher (excluding MTH 205 and MTH 206) or
  • Successful completion of MTH 111 with grade of 2.0 or higher.

Other Requirements

• Complete a minimum of 120 credit hours with a minimum grade of 2.0 or higher in all required courses.
• Complete one course designated as Cultural Perspective/Diversity, see program of study requirements. Courses are listed on page 12.
• Complete a minimum 30 of the 120 credits through NMC courses.
Group 1 Courses

Excess credits may be applied toward Group 2 requirements.

Communications

<table>
<thead>
<tr>
<th>ENGLISH DEPT.</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 111</td>
<td>English Composition ........................................4</td>
</tr>
<tr>
<td>ENG 112</td>
<td>English Composition ........................................4</td>
</tr>
</tbody>
</table>

Humanities

<table>
<thead>
<tr>
<th>ART DEPT.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 100</td>
<td>Art Appreciation ...........................................3</td>
</tr>
<tr>
<td>ART 111*</td>
<td>History of Western Art I ...................................4</td>
</tr>
<tr>
<td>ART 112*</td>
<td>History of Western Art II ..................................4</td>
</tr>
<tr>
<td>ART 213</td>
<td>Modern Art History ..........................................3</td>
</tr>
</tbody>
</table>

HISTORY DEPT.

| HST 101*               | Western Civilization to 1500 ................................4 |
| HST 102*               | Western Civilization from 1500 ..............................4 |
| HST 111*               | US History to 1865 ...........................................4 |
| HST 112*               | US History Since 1865 .......................................4 |
| HST 211*               | Native American History .....................................3 |
| HST 212*               | African-American History ....................................3 |
| HST 213*               | American Women's History ....................................3 |
| HST 225                | American Civil War ............................................3 |
| HST 228                | The Vietnam War ................................................3 |
| HST 230                | A History of Michigan .........................................3 |
| HST 235                | 20th Century Europe ..........................................3 |

HUMANITIES DEPT.

| HUM 101*               | Introduction to Humanities ..................................3 |
| HUM 102*               | Introduction to Humanities ..................................3 |
| HUM 116*               | World Cultures ................................................4 |
| HUM 221*               | Russian Language and Culture ................................4 |

WORLD LANGUAGE (INTERMEDIATE LEVEL) DEPT.

| FRN 201*               | Intermediate French I ........................................4 |
| FRN 202*               | Intermediate French II .......................................4 |
| SPN 201*               | Intermediate Spanish I .......................................4 |
| SPN 202*               | Intermediate Spanish II ......................................4 |
| SPN 227A*              | Spanish for Environmental Mgmt. ............................3 |

Note: Not all four-year schools will accept second year Foreign Language courses as Humanities Distribution credits.

LITERATURE DEPT.

| ENG 210*               | Children's Literature .........................................3 |
| ENG 240                | Introduction to Literature ....................................3 |
| ENG 241*               | Mythology ................................................................3 |
| ENG 242*               | Women in Literature .............................................3 |
| ENG 245*               | Native American Literature ....................................3 |
| ENG 254                | Shakespeare ................................................................3 |
| ENG 256                | Environmental Literature .......................................3 |
| ENG 261                | British Literature ..............................................3 |
| ENG 262                | American Literature ............................................3 |
| ENG 263*               | World Literature ................................................3 |
| ENG 264                | Detective Fiction ................................................3 |
| ENG 265                | Science Fiction and Fantasy ...................................3 |
| ENG 266                | Popular Culture ..................................................3 |
| ENG 267                | Film as Literature ...............................................3 |
| ENG 271*               | Adolescence and Cultural Diversity .........................3 |

MUSIC DEPT.

| MUS 110                | Music Appreciation Standard Literature ....................3 |
| MUS 111                | Music Appreciation Jazz ........................................3 |
| MUS 129                | History of Rock & Roll ..........................................3 |

PHILOSOPHY/RELIGION DEPT.

| PHL 101*               | Introduction to Philosophy ...................................3 |
| PHL 105*               | Critical Thinking ...............................................3 |
| PHL 121*               | Western Religions ................................................4 |
| PHL 122*               | Eastern Religions ................................................4 |
| PHL 201*               | Ethics ..................................................................3 |
| PHL 202*               | Contemporary Ethical Dilemmas ................................3 |

Mathematics

<table>
<thead>
<tr>
<th>MATH DEPT.</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 116</td>
<td>Intro to Computer Science (does not meet MTA) ...........4</td>
</tr>
<tr>
<td>MTH 120</td>
<td>Mathematical Explorations ...................................3</td>
</tr>
<tr>
<td>MTH 121</td>
<td>College Algebra ................................................4</td>
</tr>
<tr>
<td>MTH 122</td>
<td>Trigonometry ....................................................3</td>
</tr>
<tr>
<td>MTH 131</td>
<td>Intro to Probability and Statistics ........................3</td>
</tr>
<tr>
<td>MTH 141</td>
<td>Calculus I ................................................................5</td>
</tr>
<tr>
<td>MTH 142</td>
<td>Calculus II ........................................................5</td>
</tr>
<tr>
<td>MTH 205</td>
<td>Math for Elementary Teachers I (does not meet MTA) ....4</td>
</tr>
<tr>
<td>MTH 206</td>
<td>Math for Elem. Teachers II (does not meet MTA) .........4</td>
</tr>
<tr>
<td>MTH 241</td>
<td>Calculus III .....................................................4</td>
</tr>
<tr>
<td>MTH 251</td>
<td>Differential Equations .........................................4</td>
</tr>
</tbody>
</table>

Natural Science

<table>
<thead>
<tr>
<th>ASTRONOMY DEPT.</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST 109 - AST 109L</td>
<td>Planetary Astronomy ...........................................4</td>
</tr>
<tr>
<td>AST 119 - AST 119L</td>
<td>Astronomy ........................................................4</td>
</tr>
</tbody>
</table>

BIOLOGY DEPT.

| BIO 106 - BIO 106L     | Human Biology ...................................................4 |
| BIO 108 - BIO 108L     | Plant Biology .....................................................4 |
| BIO 110 - BIO 110L     | Essential Biology ................................................4 |
| BIO 115 - BIO 115L     | Cell, Plant and Ecosystem Biology ..........................4 |
| BIO 116 - BIO 116L     | Genetic, Evolution and Animal Bio ..........................4 |
| BIO 208 - BIO 208L     | Microbiology ........................................................4 |
| BIO 215                | Genetics (no lab) ................................................3 |
| BIO 227 - BIO 227L     | Human Anatomy and Physiology I .............................4 |
| BIO 228 - BIO 228L     | Human Anatomy and Physiology II ............................4 |
| BIO 250 - BIO 250L     | Natural History of Vertebrates ...............................4 |
| BIO 255                | Pathophysiology (no lab) .......................................4 |
| BIO 260 - BIO 260L     | General Ecology ..................................................5 |
| BIO 268                | Biochemistry (no lab) ............................................3 |

CHEMISTRY DEPT.

| CHM 101 - CHM 101L     | Introductory Chemistry .........................................4 |
| CHM 150 - CHM 150L - 150R | General Chemistry I ...........................................5 |
| CHM 151 - CHM 151L - 151R | General Chemistry II ..........................................5 |
| CHM 250 - CHM 250L     | Organic Chemistry I .............................................5 |
| CHM 251 - CHM 251L     | Organic Chemistry II ............................................5 |
Natural Science  (continued)

ENVIRONMENTAL SCIENCE DEPT.
ENV 103 - ENV 103L  Earth Science ....................4
ENV 104 - ENV 104L  Life of the Past .......................4
ENV 111 - ENV 111L  Physical Geology .................4
ENV 112 - ENV 112L  Historical Geology ............4
ENV 117 - ENV 117L  Meteorology and Climatology ....4
ENV 131 - ENV 131L  Oceanography ..................4
ENV 140 - ENV 140L  Watershed Science ............4
ENV 210 - ENV 210L  Fundamentals of Soil Science ..4
ENV 270A Michigan Basin Geology (lab only).........2
ENV 270B Field Mapping Techniques (lab only).......2
ENV 270C Precambrian Geology of MI (lab only) ....2

PHYSICS DEPT.
PHY 105 - PHY 105L  Physics of the World Around Us....4
PHY 121 - PHY 121L  General Physics I ................4
PHY 122 - PHY 122L  General Physics II .............4
PHY 221 - PHY 221L - 221R  Prob & Prin of Physics I ..5
PHY 222 - PHY 222L - 222R  Prob & Prin of Physics II ...5

Social Science

ANTHROPOLOGY DEPT.
ANT 113*  Introduction to Cultural Anthropology ....3

ECONOMICS DEPT.
ECO 201  Principles of Macroeconomics ............3
ECO 202  Principles of Microeconomics ............3

GEOGRAPHY DEPT.
GEO 101*  Introduction to Geography ................3
GEO 105 - GEO 105L  Physical Geography ...........4
GEO 108  Geography of U.S. and Canada ............3
GEO 109*  World Regional Geography ...............3
GEO 115  Introduction to GIS ......................3

POLITICAL SCIENCE DEPT.
PLS 101*  Intro to American Politics .................3
PLS 132*  Comparative Politics ....................3
PLS 211*  International Relations ..................3
PLS 222  Intro to Political Theory .................3
PLS 235*  U.S. Foreign Policy ..................3

PSYCHOLOGY DEPT.
PSY 101  Introduction to Psychology ...............3
PSY 211  Developmental Psychology .............3
PSY 212  Psychology/Exceptional Child ............3
PSY 221  Psychology of Personality ..............3
PSY 223  Intro to Social Psychology ............3
PSY 225  Human Sexuality ..........................3
PSY 231  Psychology of Adjustment ..............3
PSY 250  Abnormal Psychology ................3

SOCIOLOGY DEPT.
SOC 101*  Introduction to Sociology ..............3
SOC 201  Modern Social Problems ...............3
SOC 211  Marriage and the Family ................3
SOC 220*  Gender and Society ..................3
SOC 221*  Russian Language and Culture ..........4
SOC 231*  Deviance and Criminal Behavior .......3

*Cultural Perspective/Diversity
One Cultural Perspective/Diversity course is required for the ASA and AGS degrees. To meet this requirement, choose any course marked with an asterisk (*) or a 100 level French or Spanish course.

Group 2 Courses

All 100-level or higher courses not listed in the Group 1 section are Group 2 courses.
**Linked Courses**

This approach offers students an opportunity to “link” the content of a course such as the reading and writing of composition to the content of classes in areas such as business and science. Sections are generally small to allow for individual attention, and when the same students take the same sections of a composition and business class, for example, they become a “learning community” and can write composition papers about business topics, enhancing the learning in both classes. For more information, contact the Business, Communications or Humanities academic areas.

**Work-Based Learning**

NMC provides various work-based learning options.

**Internships**

Internship opportunities are offered for students who wish to integrate academics with professional work experience. Students can earn college credit while working in positions related to their academic and career goals. Contact the Office Manager in the academic area where you would like to pursue your internship.

**Service Learning** (For credit or non-credit)

Service Learning is a nationwide initiative to instill a sense of civic responsibility in students. It’s volunteerism with a learning twist, centered on the benefits students receive while providing services to their community and/or college. It is an opportunity for students to explore career or interest areas, apply classroom theory to a real situation, and gain practical experience for resume building.

Up to four internship elective credits can be applied to graduation. Students may also do non-credit volunteering using the same process. For more information, call (231) 995-2524.

**International Services**

www.nmc.edu/student-services/international-services/
(231) 995-2524

Seeking to prepare students with a foundation to create a broader understanding of the world in which we live, International Services includes:

**Global Endorsement**

NMC offers a Global Endorsement on the college transcript for students who have acquired a minimum of 100 Global Endorsement points prior to graduation. Depending on one’s degree, points may be earned in a variety of ways, but must be made up of a minimum number in each of the three following categories: Academic coursework, on and off campus global experiences, and international events. Visit the International Services web page for complete details on the requirements needed to complete the endorsement.

**Study Abroad**

Short-term opportunities in multiple destinations affiliated with various academic programs. Check online for current opportunities.

**Global Events on Campus**

International Affairs Forum lectures, Dennos Museum Center concerts and exhibits and more. Current events are posted online.

**Michigan Transfer Agreement (MTA)**

In an effort to improve the transferability of college courses between Michigan public community colleges and universities, MTA will take effect beginning the fall of 2014. Students who began prior to fall of 2014 will be able to complete the existing MACRAO agreement until the end of summer 2019. If a student already has the MACRAO agreement stamp on their transcript it is expected that the receiving institution will still honor it.

To fulfill the Michigan Transfer Agreement (MTA) students must successfully complete at least 30 Group 1 semester credits. Students must earn a grade of 2.0 or higher in each MTA course in order for it to count towards the minimum MTA requirements. Credits are distributed as follows:

- English Composition: Two courses - 6 credits.
- Humanities: Two Group 1 courses - 6 credits taken from two different departments excluding studio and performance classes.
- Mathematics: One Group 1 course – 3 credits – MTH 120 or higher, excluding MTH 205 and MTH 206.
- Natural Sciences: Two Group 1 courses - 6 credits from two different departments. One course must include a laboratory.
- Social Sciences: Two Group 1 courses - 6 credits from two different departments.

Students are required to complete at least one for-credit course at NMC before requesting the MTA Satisfied endorsement. It must be a college level course but need not be from the areas represented in the MTA. When students have completed the MTA requirements, they should notify the NMC Records Office so their transcripts will be noted “MTA SATISFIED.” Students are not required to complete an associate degree in order to satisfy the MTA.

Some students select a course of study that requires a four-year degree of which two years may be completed at NMC through completion of the Associate in Science and Arts degree (ASA). Students completing the ASA will also complete the MTA. See page 7 for ASA degree requirements. Visit www.nmc.edu/advising for additional information.
Transfer Options

Accounting
The Accounting Program contains a blend of specialized classes and liberal arts studies to prepare students for today’s competitive, complex, and changing business world. Students who plan to pursue a bachelor’s degree should refer to NMC’s degree requirements for the Associate in Science and Arts (ASA) degree. Also, transfer students should familiarize themselves with the requirements of the school where they plan to complete their bachelor’s degree. Students interested in a bachelor’s degree may also elect to stay in Traverse City and transfer to the University Center.

Anthropology
Anthropology is the study of humanity. Archaeology is the study of the material humans leave behind. Students planning to pursue degrees in anthropology or archaeology at four-year colleges or universities should take these courses. Introduction to Cultural Anthropology (ANT 113) is a required course for many areas of study.

NMC offers specialty courses in Nautical and Underwater Archaeology that may not be found at larger institutions. The Nautical Archaeology Society courses that are taught at NMC offer an internationally recognized certificate in nautical archaeology. This area of study can include fieldwork and research activities in northwestern Michigan, as well as, application of advanced technologies. Students planning careers in the following field may find these courses useful: offshore oil and gas industry, underwater search and recovery (such as police divers), maritime and naval, university research, homeland security, commercial surveying, remote sensing (applied water-related technologies), cultural heritage development and management. Contact Mark Holley for more information at mholley@nmc.edu. See page 56 for course listings.

Art/Fine Arts
The Fine Arts and Visual Communications courses are designed for students who plan to transfer to a four-year college or university for a Bachelor’s or Master’s degree in Fine Arts (BFA or MFA). Careers for students specializing in Fine Arts include education, museum/gallery management, commercial illustration, animation and character development, film and graphic arts.

Students specializing in Fine Arts while completing an Associate in Science and Arts degree at NMC will pursue a program of study which includes Drawing, 2-D Design and 3-D Design while offering tracks in Fine Studio Arts and Ceramics, Illustration, Photo, Animation/Character Design, Photography, Visual Communications, Painting and Art History. Students are urged to discuss course selection early with transfer schools since portfolio requirements for admission vary. See page 7 for Associate in Science and Art degree requirements.

Astronomy
NMC offers courses that focus on Observational, Planetary, and Stellar Astronomy. Students planning on transferring to pursue a bachelor’s degree in this area should also take course work in Mathematics and Physics. See page 59.

Biology
Individuals planning to pursue a bachelor’s degree in Biology should select from courses beginning on page 64. In addition, students should select courses in Mathematics, Chemistry and Physics.

Business Administration
Students planning to pursue a four-year degree in Business Administration should follow NMC’s degree requirements for the ASA or AAS degree (depending on the transfer institution) and familiarize themselves with the requirements of the school of choice for their bachelor’s degree.

Chemistry
Students planning on transferring to pursue a bachelor’s degree in Chemistry will pursue course work which includes credits selected from those beginning on page 69. In addition to taking Chemistry courses, students with an emphasis in Chemistry gain a solid background in Math and Physics.

Communications
Communications as a separate field of study may include a variety of careers and specialties, ranging from media and public relations to technical writing. It is also an important component of other programs of study or careers, including computer science, human services, health occupation and art therapy.

Criminal Justice
NMC and Ferris State University have partnered to offer the Bachelor of Science degree in Criminal Justice where students complete 85 credits at NMC and 35 credits at FSU, which can be completed at the University Center in Traverse City. NMC also offers a Criminal Justice program in collaboration with other colleges through the Michigan Colleges Online. This program involves agreements that lead to a four-year degree from another college/university. Visit www.nmc.edu/online for current information on the status of this program, the courses, program requirements, or articulation agreements.

NMC. Find it here.

www.nmc.edu
Early Childhood Education  
**NMC Code 722**
Early Childhood Education programs are designed to prepare students to work with children and their families in early care and education settings. Students may seek a career as the director of a child care program, a paraprofessional/teacher’s aide in the school system, a lead teacher in a daycare/preschool setting, a daycare teacher’s aide, or preparing for a bachelor’s degree in Child Development. If you are pursuing elementary education, please consult the transfer guide from the transferring school or see an advisor.

Economics  
**NMC Code 732**
The most basic and enduring strength of economics is that it provides a logical and orderly way of analyzing contemporary economic issues. It draws upon geography, history, philosophy, and mathematics to address topics ranging from how an individual, household or firm, can make rational decisions regarding spending, saving, investment and profits to how a society can make optimal decisions regarding economic growth, inflation, unemployment, trade, and environment. As a result, economics is widely recognized as a solid background for many jobs and professions in the private and public sectors. Students interested in this field of study will select courses from among those on page 78.

Education  
**NMC Code 708**
NMC offers an introductory course to teaching as a career and prepares student for further study in education at transfer institutions. Transfer requirements vary greatly. Go to [www.nmc.edu/advising](http://www.nmc.edu/advising) to view NMC transfer guides.

Engineering  
**NMC Code 709**
The NMC engineering curriculum parallels engineering programs offered during the first two years at other colleges and universities. Traditionally, these first two years emphasize the tools and theories that provide background for all engineering fields. Completion of the following program requirements will prepare students for transfer to four-year engineering programs.

Northwestern Michigan College has joined with Michigan Technological University, Kettering University, and Lake Superior State University to offer a two plus two program whereby a student attends NMC for the first two years and then completes the final two years of an engineering degree at one of the participating four-year institutions. A student admitted into the two plus two program at NMC has the added advantage of a guaranteed place in the major of their choice at one of the four year institutions.

**ENGINEERING REQUIREMENTS**  
**Credits: 69-76**
General Education Credits as required for ASA........... 18-20
Chemistry*: CHM 150......................................................... 5
Mathematics**: MTH 141, 142, 241, and 251....................... 18
Physics: PHY 221 and 222............................................. 10
Engineering: EGR 101, 113, 201, 202, 203.................... 14
Additional Requirements: EGR 131 and/or MTH 116 based on program choice.............................................. 4-9

**Note:** Use this list of courses as a guide only. It is not applicable for all engineering specialties or all schools of engineering. It is important to follow specific requirements for each engineering program available in transfer guides at [www.nmc.edu/advising](http://www.nmc.edu/advising) or in the Advising Center. Students who plan to earn an associate degree at NMC before transferring should consult an advisor for assistance in modifying this schedule.

Engineering Certificate  
**NMC Code 079**

**ENGINEERING REQUIREMENTS**  
**Credits: 51-56**
Chemistry: CHM 150 ..................................................... 5
Mathematics: MTH 141, 142, 241, and 251....................... 18
Physics: PHY 221 and 222............................................... 10
Engineering: EGR 101, 113, 201, 202, 203.................... 14
EGR 131 and/or MTH 116 based on program choice...................... 4-9

English  
**NMC Code 710**
Students wishing to concentrate their studies in the field of English may be preparing for careers in writing or teaching. English is also crucial to many other careers since writing and reading are high-demand skills in most professions. Students planning to transfer to complete a bachelor’s degree in English should pursue an Associate in Science and Arts degree program that includes credits selected from among the courses beginning on page 82.

Environmental Science  
**NMC Code 717**
The study of Environmental Science includes courses in Geology, Biology, Meteorology, Chemistry, Soils, Oceanography and Watershed Science. Students planning on transferring to pursue a bachelor’s degree in any of these areas will choose a program of study which includes courses selected from those beginning on page 86. Students are encouraged to contact a faculty member in the Science department to learn more about employment opportunities and for assistance with class scheduling.

Freshwater Studies  

**Economy and Society**  
**NMC Code 592**

**Global Freshwater Policy and Sustainability**  
**NMC Code 591**

**Science and Technology**  
**NMC Code 593**

**General**  
**NMC Code 590**

Students planning to pursue a four-year degree in Freshwater Studies should follow NMC’s degree requirements for the ASA degree on page 7. Students are strongly encouraged to consult a Freshwater Studies advisor for scheduling guidelines and degree selection.

Geography  
**NMC Code 726**
NMC offers course work in Physical Geography and Introduction to Geography. Regional courses are also offered that focus on the United States and Canada and the World. In addition, a tools course concentrating on Geographic Information Systems (GIS) is offered. Students planning on pursuing a rewarding career in Geography are encouraged to meet with the Geography Department Head for help in course selection. See page 88 for course listings in Geography.
**Geology**  
*NMC Code 717*  
Students interested in pursuing a career as a Geologist will take Environmental Studies courses, including Physical and Historical Geology. In addition, students will complete course work in Chemistry, Physics, and Mathematics.

**History**  
*NMC Code 730*  
As a separate field of study within the humanities, history will prepare students to enter secondary education, journalism, the archival and museum professions, and a variety of public history positions upon completion of at least a bachelor’s degree. It will also prepare students for entering professional and graduate schools in law and in fields that will enable graduates to teach and do research in institutions of higher learning.

**Liberal Arts/Science**  
*NMC Code 712*  
Students interested in transferring to pursue a bachelor’s degree should enroll in the General Liberal Arts/Science area of study if they are undecided. Students planning on pursuing this avenue will select Group 1 courses from the course descriptions beginning on page 12.

**Mathematics**  
*NMC Code 715*  
Students planning on transferring to complete a bachelor’s degree in Mathematics will pursue course work that includes MTH 141, MTH 142, MTH 241, and MTH 251. Other suggested courses include PHY 221, PHY 222 & MTH 116.

**Music**  
*NMC Code 716*  
Professional opportunities for a skilled musician are endless in that music, in some way, touches our lives every day in many ways. The study of music offers a vast variety of career options including: music education, instrumental music, vocal performance, conducting, composing, music for worship, music business, instrument making and repair, music publishing, music communications, recording industry, and in the TV and radio industry.  
NMC offers students the opportunity to complete the first two years of music-major coursework in a creative and supportive environment. Students receive individualized instruction from our dynamic faculty in classes designed for students’ success. Standard music-major coursework includes: Music Theory, Sight Singing and Ear Training, Group Piano Instruction, Applied Instruction (private lessons), and participation in NMC Music Ensembles. Upon successful completion of the two-year program, students will have earned an Associate in Science and the Arts degree that is transferable to most four-year institutions of higher learning.  
NMC also offers many opportunities for those students pursuing non-music degree paths, but interested in continuing their participation in a music program. Any NMC student (music-major or not) may enroll for Applied Instruction and may participate in any of our NMC Music Ensembles: NMC Chamber Singers, NMC Grand Traverse Chorale, NMC Concert Band, NMC Jazz Ensemble, and the NMC Vocal Jazz Ensemble. Other opportunities (chamber groups, percussion ensembles, jazz combos, etc.) are also available for interested NMC students.

**Performing Arts**  

**DANCE**  
*NMC Code 707*  
Students wishing to pursue an interest in the field of dance should take the courses in dance on page 78 and consult with an advisor and the dance faculty member before their first semester at NMC.

**Philosophy and Religion**  
*NMC Code 729*  
Careers in the fields of philosophy and religion include college teaching and research, secondary education, as well as positions as ministers, priests, or rabbis. Other potential careers for those who specialize in religion are pastoral administration, religious education, church office management, and church mission work. The fields of clinical medicine and medical research as well as commercial business fields like accounting are employing ethicists, a specialized branch of philosophy.

Students seeking to transfer to a four-year college or university to major in philosophy or religion may complete basic course work while at NMC. That course work will include credits selected from those courses on page 115.

**Physical Education**  

Physical Education activity courses are offered to students wishing to expand personal interests, health and fitness, re-creation, and sports skills. Most physical education courses provide a starting point for students transferring to four-year institutions and who seek a physical education major or minor.

**Physics**  
*NMC Code 717*  
Students planning on transferring to complete a bachelor’s degree in physics will pursue course work which includes credits selected from those courses on page 115. These students should also include Calculus I, II, & III, Differential Equations, and General Chemistry I & II.

**Plant Science, Applied**  

**Agricultural Operations**  
*NMC Code 583*  

**Fruit and Vegetable Crop Management**  
*NMC Code 581*  

**Landscape Management**  
*NMC Code 582*  

**Viticulture**  
*NMC Code 580*  
Students interested in pursuing a four-year degree in Plant Science should follow a general education curriculum with courses in science, including Chemistry and Biology. In addition, students may take technical courses in soils, plants and plant diseases from Michigan State University at the NMC University Center. See page 49 for course requirements.
Political Science  

Political science as a field includes the study of American politics, comparative politics, international relations, political theory, and political economy. Undergraduate courses in political science are an important component of any liberal arts education as students gain important knowledge concerning the political structures that shape our world. Courses in political science are especially useful for students pursuing careers or advanced degrees in public policy, law, business, economics, social work, education, history, and, of course, politics. Bachelor’s and graduate degrees in political science and public policy offer career opportunities in a variety of areas such as education, policy research, law, and international business. Students interested in political science courses, see page 116.

Pre-Law  

Pre-law is a major often selected by students interested in pursuing careers in government or law.

Pre-Med, Pre-Dental, Pre-Vet  

The medical sciences major is designed for pre-professional students interested in graduate training in the medical field.

Psychology  

Students interested in the following fields of psychology, such as counseling, social work, research or teaching, may select from courses such as Introduction to Psychology, Introduction to Social Psychology, Developmental Psychology, Exceptional Child, Human Sexuality, Abnormal Psychology, Psychology of Personality and Psychology of Adjustment.

Social Work  

The social work courses are designed to transfer to other four-year schools with certified social work programs. It is specifically designed to fit into the Ferris State University Social Work Program at the University Center in Traverse City and on the Ferris main campus in Big Rapids. When choosing this program of study, it is highly recommended to meet with the social work coordinator; call (231) 995-1294. This will assist you in building a program that will transfer smoothly. Social work is a rapidly growing field that employs people in many different areas of work and requires very specific training and course work. Students interested in this field of study will select courses from among those beginning on page 120.

Sociology  

Sociology is the study of the social context of human behavior. It includes the study of social change; socialization of group attributes such as social class, race, gender and age; and the workings of our social institutions. Courses in sociology are an important component of any liberal arts education, especially involving critical thinking and an understanding of diversity. It is also a major study for those interested in a wide variety of careers including teaching, social work, public policy, criminal justice, law, non-profit organizations, and social research. See page 118 for course listings.

World Languages  

World Languages as a field of study at NMC includes specialization in American Sign Language, French, and Spanish. In a world of international telecommunications and interdependent economies, language specialization is an important component for those planning careers in business, communication, or teaching.

To apply, use the three-digit NMC Code on your admissions application.
Occupational Programs

Occupational degrees and certificate programs prepare students to enter the workforce through development of technical specialties and related skills appropriate to the chosen occupational area. See the following program listings for specific program requirements.

Each Occupational program has specific learning outcomes that are assessed each year. Assessment methods vary from program to program. Specific outcomes are available from the academic chair. Students who would like to know how a specific academic area meets these outcomes should contact the academic chair of that area.

Accounting

**Associate in Applied Science Degree**  NMC Code 103

This program will prepare students to begin a career in accounting. Graduates will be prepared to work as bookkeepers and entry-level accountants in accounts receivable, accounts payable, payroll, and other entry-level areas of accounting. Students considering transfer should see an advisor.

**General Education Requirements**  Credits: 17-18

Communications: ENG 111 and either BUS 231 or ENG 112 .................................................. 7-8
Humanities: PHL 201 or PHL 202 .......................................................... 3
Math competency: Placement into MTH 111 or higher, or completion of MTH 23 or MTH 23A and MTH 23B
Science: Any Group I course with a lab ................................................. 4
Social Sciences: ECO 201 ................................................................. 3

**Occupational Specialty Requirements**  39

ACC 121 Accounting Principles I ................................................. 4
ACC 122 Accounting Principles II ................................................. 4
ACC 221 Intermediate Accounting I .............................................. 4
ACC 222 Intermediate Accounting II .............................................. 4
ACC 225 Cost/Management Accounting ........................................ 3
BUS 101 Introduction to Business ................................................ 3
BUS 105 Business Math** ............................................................... 3
BUS 155 Interpersonal Communications ........................................ 3
BUS 261 Business Law I ................................................................. 3
CIT 100 Computers in Business-An Intro ..................................... 3
CIT 210 Microsoft Office - Excel .................................................. 3
CIT 216 Computerizing Accounting Systems ................................ 2

**Directed Electives (Choose any combination)**  6-7

ACC 231 Federal Income Tax Problems ........................................ 3
ACC 241 Principles of Fraud Examination ..................................... 3
ACC 290 Accounting Internship .................................................... 3
ECO 202 Principles of Microeconomics ......................................... 3
MG 41 Principles of Management .................................................. 3
MKT 201 Principles of Marketing .................................................... 3
MTH 111 Intermediate Algebra*** .................................................. 4
MTH 131 Intro to Probability and Statistics .................................... 3

* Students intending to transfer to another college or university should take ENG 112.

** It is recommended that BUS 105 be taken before or concurrently with ACC 121.

*** Or a higher level math course, excluding MTH 116.

**Program Information**

To apply, use the three-digit NMC Code on your admissions application.

Program Requirements 62-64

Administrative Support Specialist

**Certificate of Achievement (Level II)**  NMC Code 003

Well-trained office professionals continue to be in demand and play an integral role in the successful operation of an organization. They work as a team with managers, professionals, and other support staff to control and manage administrative operations.

The Administrative Support Specialist Certificate builds on the Computer Studies-Office Applications Specialist Certificate and focuses on specific skills which area employers consider essential.

**Level II Certificate Requirements**  Credits: 31

Completion of all courses required for the Office Applications Specialist Certificate (see page 27) …… 15
ACC 121 Accounting Principles I ................................................. 4
BUS 101 Introduction to Business ................................................ 3
BUS 231 Professional Communications ........................................ 3
BUS 290 Business Administration Internship ................................ 3
PHL 105 Critical Thinking ............................................................ 3

Note: Students selecting this certificate program need beginning keyboarding skills.
Audio Technology
Associate in Applied Science Degree  NMC Code 451

The NMC Audio Tech program will help prepare students for a career in the audio technology field. Careers in the audio technology field include: Sound Engineer, Recording Engineer, Sound Designer, Live and Theater Sound Engineer, Composer, Mixing Engineer, Mastering Engineer, Archivist, Audio and Visual Equipment Technician, Producer, Broadcast Technician, Pro Tools Operator, Audio Editor, and Audio Post Production.

At NMC, we believe our Audio Tech students will be better prepared for the workforce and the ever-changing music industry by combining aspects of a traditional music education, hands-on training on the newest technology, and opportunities to learn in a variety of environments and experiences – the studio, the stage, and the classroom. Students will have the opportunity to learn, and work with, industry-standard hardware and software recording platforms including: Pro Logic, Studio One, and Pro Tools. Students will also have practical real-world experience in studio and live recording, sound design, composing, mixing, and mastering. The NMC Audio Tech Program is designed to be completed in four semesters. While completing coursework in the Audio Tech program, students will have the opportunity to earn platform-specific certification, professional credentials of value, and an Associate in Applied Science degree.

General Education Requirements  Credits: 17-18
Communications: ENG 111  and either
  BUS 231 or ENG 112 ........................................... 7-8
Humanities: MUS 110 or MUS 111 .............................. 3
Mathematics competency: Placement into MTH 111 or higher, or completion of MTH 23 or MTH 23A and MTH 23B
Science: Any Group 1 course with lab ......................... 4
Social Sciences: Any Group 1 course .......................... 3

Occupational Specialty Requirements  44
AUD 100  Intro to Audio Tech ................................... 2
AUD 101  Theory for Studio Engineers .......................... 2
AUD 110  Sound Recording I .................................... 2
AUD 111  Sound Recording II ................................... 2
AUD 120  Digital Audio I ......................................... 2
AUD 121  Digital Audio II ........................................ 2
AUD 130  Live Sound I ............................................ 2
AUD 131  Live Sound II ........................................... 2
AUD 210  Sound Recording III .................................... 2
AUD 220  Digital Audio III ....................................... 2
AUD 230  Live Sound III .......................................... 2
AUD 250  Audio Tech Practicum ................................ 2
AUD 260  Audio Tech Internship ................................ 3
AUD 270  Audio Tech Final Project ............................ 3
MUS 101  Theory of Music  or
MUS 100A  Intro to Music Theory I** ......................... 3
MUS 102  Theory of Music  or
MUS 100B  Intro to Music Theory II** ....................... 3
MUS 103  Sight Singing and Ear Training  or
MUS 105A  Intro to Ear Training I** ......................... 1
MUS 104  Sight Singing and Ear Training  or
MUS 105B  Intro to Ear Training II** ....................... 1
MUS 106  Class Piano I .......................................... 2
MUS 107  Class Piano II .......................................... 2
MUS 112  Class Guitar I ......................................... 2

**Students will take a Music Theory Placement Test at the start of the semester.

Program Requirements  61-62

Audio Technology
Certificate of Achievement (Level I)  NMC Code 045

The Audio Technology field is a dynamic industry offering a variety of career opportunities. Upon successful completion of the core Audio Technology coursework, students may earn the Audio Technology Level I Certificate of Achievement.

Certificate Requirements  Credits: 16
AUD 100  Intro to Audio Tech ................................... 2
AUD 101  Theory for Studio Engineers .......................... 2
AUD 110  Sound Recording I .................................... 2
AUD 111  Sound Recording II ................................... 2
AUD 120  Digital Audio I ......................................... 2
AUD 121  Digital Audio II ........................................ 2
AUD 130  Live Sound I ............................................ 2
AUD 131  Live Sound II ........................................... 2

Audio Technology
Certificate of Achievement (Level II)  NMC Code 046

The Audio Technology field is a dynamic industry with new technologies being introduced at a rapid pace. To stay abreast of the latest tools and trends, students may enroll in advanced Audio Technology coursework and earn the Audio Technology Level II Certificate of Achievement.

The Audio Technology Level II Certificate of Achievement builds upon the skills learned in the Level I Certificate of Achievement.

Level II Certificate Requirements  32
Prerequisites: Completion of Audio Technology Level I Certificate (16 credits)

Level I Certificate Requirements  Credits: 16
AUD 210  Sound Recording III .................................... 2
AUD 220  Digital Audio III ....................................... 2
AUD 230  Live Sound III .......................................... 2
AUD 250  Audio Tech Practicum ................................ 2
AUD 260  Audio Tech Internship ................................ 3
AUD 270  Audio Tech Final Project ............................ 3
MUS 106  Class Piano I  or
MUS 112  Class Guitar I ......................................... 2
Automotive - Automotive Service Technology

**Associate in Applied Science Degree**  NMC Code 560

This program is designed for either the person with little or no prior experience or the skilled technician who needs to keep pace with current technology. Students may take the classes they need to update skills, pursue an Associate in Applied Science degree which combines automotive technician classes with courses in the liberal arts and sciences, or work toward a Master Technician Certificate which qualifies graduates to enter the workplace as entry-level state-certified technicians. Students may also choose from three specialized certificates: Hybrid Technology, Under Car Specialist or Electrical and Drivability Specialist. The certificates are explained in more detail in the proceeding pages. All eight state or ASE certifications must be passed to be awarded the AAS degree or Master Technician Certificate.

Day and evening classes allow technicians at every level to develop new skills at convenient times. The program is a series of modules, each designed to teach an individual system. This flexibility allows the more experienced technician to learn a specific system while the beginning technician can combine the modules for a complete course in automotive technology.

**Foundation Requirements**
For successful completion of the AT courses, placement into ENG 111 and completion of MTH 08 or placement into MTH 23 is recommended.

**General Education Requirements**  Credits: 17-18
Communications: ENG 111  and either BUS 231 or ENG 112 or ENG 220 ............................................. 7-8
Humanities: Any Group 1 course  .................................. 3
Math competency: Placement into MTH 111 or higher, or completion MTH 23 or MTH 23A and MTH 23B
Science: Any Group 1 course with lab  ............................. 4
Social Sciences: Any Group 1 course  .............................. 3

**Occupational Specialty Requirements**  59
AT 100**  Automotive Service Basics .............................. 2
AT 110  Automotive Brake Systems ............................... 5
AT 120**  Automotive Electrical I ................................. 5
AT 130  Engine Performance I ................................. 5
AT 140  Suspension and Steering ................................. 4
AT 150  Automatic Transmissions ................................. 6
AT 160  Engine Repair ............................................. 6
AT 170  Heating and Air Conditioning ........................... 4
AT 180  Manual Drivetrain and Axles ............................ 6
AT 200  Service Department Management ........................ 2
AT 210  Hybrid Technology ........................................ 5
AT 220  Automotive Electrical II ................................. 5
AT 230  Engine Performance II .................................... 4

All eight state or ASE certifications must be passed to be awarded the AAS degree or Master Technician Certificate.

**Program Requirements**  76-77

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Automotive - Electrical & Drivability Specialist

**Certificate of Achievement (Level II)**  NMC Code 031

This certificate is designed to train students in the automotive systems related to the operation of the engine and its control systems. Emphasis is placed on the automotive electrical and electronic control systems. For students to be awarded this Electrical and Drivability Specialist certificate, they must pass the related State of Michigan exams or ASE test for all five of the required automotive courses.

**Foundation Requirements**
For successful completion of the AT courses, placement into ENG 111 and completion of MTH 08 or placement into MTH 23 is recommended.

**Certificate Requirements**  Credits: 32
AT 100*  Automotive Service Basics .............................. 2
AT 120  Automotive Electrical I .................................. 5
AT 130  Engine Performance I .................................... 5
AT 160  Engine Repair ............................................. 6
AT 220  Automotive Electrical II .................................. 5
AT 230  Engine Performance II .................................... 4
Elective course .................................................... 5

*May be waived with appropriate work experience or education.

**Program Completion Requirements**
A minimum of 32 AT credit hours are required to receive this certificate. Students must choose elective courses from the Automotive Program course list to reach the required credit level.

Must pass the related State of Michigan or ASE test for all of the required automotive courses.

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**Program Information**
### Automotive - Hybrid Technology Specialist

**Certificate of Achievement (Level II)**  
NMC Code 034

#### Foundation Requirements
For successful completion of the AT courses, placement into ENG 111 and completion of MTH 08 or placement into MTH 23 is recommended.

#### Certificate Requirements  
<table>
<thead>
<tr>
<th>Credits: 32-34</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT 100* Automotive Service Basics ............................... 2</td>
</tr>
<tr>
<td>AT 120* Automotive Electrical I .................................. 5</td>
</tr>
<tr>
<td>AT 130* Engine Performance I .................................... 5</td>
</tr>
<tr>
<td>AT 150* Automatic Transmissions or ............................. 6</td>
</tr>
<tr>
<td>AT 210* Hybrid Technology ....................................... 5</td>
</tr>
<tr>
<td>AT 220* Automotive Electrical II ................................. 5</td>
</tr>
</tbody>
</table>

*May be waived with appropriate work experience or education.

#### Program Completion Requirements
A minimum of 32 AT credit hours are required to receive this certificate. Students must choose elective courses from the Automotive Program course list to reach the required credit level. Must pass the related State of Michigan or ASE test for all of the required automotive courses.

### Automotive - Master Automotive Technician

**Certificate of Achievement (Level III)**  
NMC Code 001

State and federal levels of certification are offered.

#### Foundation Requirements
For successful completion of the AT courses, placement into ENG 111 and completion of MTH 08 or placement into MTH 23 is recommended.

#### Certificate Requirements  
<table>
<thead>
<tr>
<th>Credits: 59</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT 100** Automotive Service Basics ............................ 2</td>
</tr>
<tr>
<td>AT 110 Automotive Brake Systems .................................. 5</td>
</tr>
<tr>
<td>AT 120** Automotive Electrical I ................................. 5</td>
</tr>
<tr>
<td>AT 130* Engine Performance I .................................... 5</td>
</tr>
<tr>
<td>AT 140 Suspension and Steering .................................... 4</td>
</tr>
<tr>
<td>AT 150* Automatic Transmissions ................................. 6</td>
</tr>
<tr>
<td>AT 160* Engine Repair .............................................. 6</td>
</tr>
<tr>
<td>AT 170 Heating and Air Conditioning ............................. 4</td>
</tr>
<tr>
<td>AT 180 Manual Drivetrain and Axles ............................. 6</td>
</tr>
<tr>
<td>AT 200 Service Department Management ......................... 2</td>
</tr>
<tr>
<td>AT 210* Hybrid Technology ......................................... 5</td>
</tr>
<tr>
<td>AT 220* Automotive Electrical II ................................. 5</td>
</tr>
<tr>
<td>AT 230* Engine Performance II .................................... 4</td>
</tr>
</tbody>
</table>

Must pass all eight (8) State or ASE certification tests to be awarded this certificate.  
*May be waived with appropriate work experience or education.*

### Automotive - Under Car Specialist

**Certificate of Achievement (Level II)**  
NMC Code 032

This certificate is designed to train students in the systems underneath the automobile, including brakes, suspension, and drive train. For students to be awarded this Under Car Specialist certificate, they must pass the related State of Michigan or ASE test for all five of the required automotive courses.

#### Foundation Requirements
For successful completion of the AT courses, placement into ENG 111 and completion of MTH 08 or placement into MTH 23 is recommended.

#### Certificate Requirements  
<table>
<thead>
<tr>
<th>Credits: 32</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT 100* Automotive Service Basics ............................ 2</td>
</tr>
<tr>
<td>AT 110 Automotive Brake Systems ................................. 5</td>
</tr>
<tr>
<td>AT 120* Automotive Electrical I .................................. 5</td>
</tr>
<tr>
<td>AT 140 Suspension and Steering .................................... 4</td>
</tr>
<tr>
<td>AT 150* Automatic Transmissions ................................. 6</td>
</tr>
<tr>
<td>AT 180 Manual Drivetrain and Axles ............................. 6</td>
</tr>
<tr>
<td>Elective course ....................................................... 4</td>
</tr>
</tbody>
</table>

*May be waived with appropriate work experience or education.*

#### Program Completion Requirements
A minimum of 32 AT credit hours are required to receive this certificate. Students must choose elective courses from the Automotive Program course list to reach the required credit level. Students must pass the related State of Michigan or ASE test for all of the required automotive courses.

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NMC. Find it here.
Aviation

Associate in Applied Science Degree  NMC Code 562

Admission Required
A special application for Aviation is required. Contact program advisor for details.

General Education Requirements  Credits: 17-18

Communications: ENG 111 and either ENG 112 or ENG 220 or BUS 231 ......................................................... 7-8
Humanities: Any Group 1 Course ........................................ 3
Math competency: Placement into MTH 111 or higher, or completion of MTH 23 or MTH 23A and MTH 23B
Science: Any Group 1 Course with lab .................................. 4
Social Sciences: Any Group 1 course .............................. 3

*MTH 23 credits do not count toward degree requirements.

Occupational Specialty Requirements  23

AVF 111 Private Flight .................................................. 5
AVF 118 Instrument Flight I ......................................... 1
AVF 130 Instrument Flight II ....................................... 2
AVG 101 Private Ground School .................................. 5
AVG 161 Mechanics for Pilots .................................... 3
AVG 202 Advanced Aircraft Systems ......................... 3
AVG 252 Instrument Ground School ............................ 4

Choose at least 24 credits from the following list of courses:

AVF 141 Introduction to UAS .................................. 3
AVF 230 Commercial Flight I .................................. 2
AVF 232 Commercial Flight II .................................. 2
AVF 234 Commercial Flight III .................................. 2
AVF 241 UAS II ......................................................... 3
AVF 271 Multi-Engine Flight .................................... 1
AVF 274 Tailwheel Flight ........................................ 1
AVF 275 Seaplane Flight ......................................... 2
AVF 281 Advanced Cross Country Flight ................ 2
AVF 283 Upset Maneuver Training ......................... 1
AVF 284 Instrument Flight Instructor ..................... 2
AVF 285 Crew Resource Management Flight .......... 2
AVF 382 Flight Instructor Rating ............................... 4
AVG 190 Aviation Weather ...................................... 3
AVG 204 Airline Aircraft Ground School .................. 3
AVG 210 UAS I .......................................................... 4
AVG 231 Aviation Law ............................................... 3
AVG 240 Corporate Aviation Ground ......................... 3
AVG 251 Commercial Ground School ..................... 4
AVG 285 Crew Resource Dynamics ......................... 3
AVG 381 Instructor Ground School ............................. 5

To obtain the Associate in Applied Science Degree, students must complete a minimum of three flight courses listed in this catalog through the normal process for obtaining credit. All AVF and AVG courses must be completed with a 2.0 grade or higher. Please consult an aviation advisor for scheduling guidelines.

Independent study and specialty courses are also available. Examples: Airline Transport Pilot (ATP), Unmanned Systems, and Advanced Aviation topics.

Before beginning flight training, students must obtain a medical certificate from an FAA-approved doctor. Visit www.flightphysical.com or www.faa.gov for a list of FAA-approved doctors. Students must be cleared to fly by the TSA before receiving flight instruction.

Program Requirements  64-65

Bridge Learning Community

Academic and Workforce Training

The NMC Bridge Learning Community is designed to transition the nontraditional adult learner into higher education or to upgrade workforce skills. This academic program offers skill set development through intensive, hands-on curricula in career exploration, student success strategies, technology and a math bootcamp refresher in a learning community environment. Learners can opt for industry-recognized Microsoft certifications while they prepare to become online and lifelong learners. Students work through a career development process emphasizing employability activities that help determine career pathways.

Foundational Bridge Classes  Credits: 7

CIT 119 Microsoft Office – Word .................................. 3
CIT 122A Computer and Internet Basics I ................. 1
ENG 107 Academic Study Methods .............................. 2
PSY 100 Career Explorations and Planning ............ 1
Math Bootcamp .................................................. 0

To apply, use the three-digit NMC Code on your admissions application.
Business Administration
Associate in Applied Science Degree  NMC Code 105

This program prepares students for the challenges of the ever-changing world of business. Specialized courses and liberal arts studies provide students with a foundation needed to pursue careers characterized by technology, constant change, and increasing competition.

The order in which courses are taken is not critical except where prerequisites are involved. Course substitutions may be made only with the approval of the program coordinator or the academic area chair.

Students planning to pursue a four-year degree in Business Administration should follow NMC’s degree requirements for the ASA degree and familiarize themselves with the requirements of the school of choice for their bachelor’s degree.

Students intending to transfer to another college should take ENG 112.

Students planning to enter the business world upon completion of a two-year degree should pursue an AAS degree in Business Administration.

General Education Requirements  Credits: 17
Communications: ENG 111 and BUS 231 ............................................ 7
Humanities: PHL 202 or PHL 201 .................................................. 3
Math competency: Placement into MTH 111 or higher, or completion of MTH 23 or MTH 23A and MTH 23B .............................. 3
Science: Science Group 1 course with a lab .................................. 4
Social Sciences: ECO 201 .......................................................... 3

Occupational Specialty Requirements  38
ACC 121 Accounting Principles I .................................................. 4
ACC 122 Accounting Principles II .................................................. 4
BUS 101 Introduction to Business ............................................... 3
BUS 105 Business Math ............................................................ 3
BUS 155 Interpersonal Communications .................................... 3
BUS 261 Business Law I ............................................................ 3
BUS 290 Business Administration Internship ......................... 3
CIT 100 Computers in Business-An Intro ................................ 3
CIT 210 Microsoft Office - Excel ............................................. 3
MGT 241 Principles of Management ......................................... 3
MGT 251 Human Resources Management .............................. 3
MKT 201 Principles of Marketing .............................................. 3

Directed Electives (Choose any combination)
Any 5 credits from the following: .................................................. 5
ACC 216 Principles of Fraud Examination .................................. 3
CIT 124 Microsoft Office - PowerPoint .................................. 2
CIT 170 Microsoft Office - Access ........................................... 3
CIT 213 Networking Technologies ............................................. 4
CIT 216 Computerized Accounting Systems .......................... 2
CIT 233 Project Management ................................................... 3
ECO 202 Principles of Microeconomics .................................... 3
ENG 112 English Composition .................................................. 4
MGT 245 Principles of Entrepreneurship .................................. 3
MGT 246 Entrepreneur Marketing/Finance ............................. 4
MKT 241 Principles of Advertising ............................................ 3
MTH 111* Intermediate Algebra .............................................. 4
MTH 131 Intro to Probability and Statistics ............................. 3
VCA 150 Digital Graphic Design I ........................................... 3
* Or a higher level math course, excluding MTH 116

Program Requirements  60

Business Administration - Online
Associate in Applied Science Degree  NMC Code 105

Online Option for the General Business Concentration: NMC offers an online alternative for students pursuing an Associate in Applied Science degree in Business Administration. Students are strongly encouraged to meet with an academic advisor because not all classes are offered online every semester, and students must complete an internship and science with lab, which require on-site attendance.

General Education Requirements  Credits: 17
Communications: ENG 111 and BUS 231 ...................................... 7
Humanities: PHL 202 or PHL 201 .................................................. 3
Math competency: Placement into MTH 111 or higher, or completion of MTH 23 or MTH 23A and MTH 23B .............................. 3
Science: Science Group 1 course with a lab** ................................ 4
Social Sciences: ECO 201 .......................................................... 3

Occupational Specialty Requirements  38
ACC 121 Accounting Principles I .................................................. 4
ACC 122 Accounting Principles II .................................................. 4
BUS 101 Introduction to Business ............................................... 3
BUS 105 Business Math ............................................................ 3
BUS 155 Interpersonal Communications .................................... 3
BUS 261 Business Law I ............................................................ 3
BUS 290 Business Administration Internship** ......................... 3
CIT 100 Computers in Business-An Intro ................................ 3
CIT 210 Microsoft Office - Excel ............................................. 3
MGT 241 Principles of Management ......................................... 3
MGT 251 Human Resources Management .............................. 3
MKT 201 Principles of Marketing .............................................. 3

Directed Electives (Choose any combination)
Any 5 credits from the following: .................................................. 5
CIT 124 Microsoft Office - PowerPoint .................................. 2
CIT 170 Microsoft Office - Access ........................................... 3
CIT 216 Computerized Accounting Systems .......................... 2
ECO 202 Principles of Microeconomics .................................... 3
ENG 112 English Composition .................................................. 4
MTH 111* Intermediate Algebra .............................................. 4
MTH 131 Intro to Probability and Statistics ............................. 3
* Or a higher level math course, excluding MTH 116
** Requires on-site attendance

Program Requirements  60

If you are seeking online courses for your specific program that are not currently offered online, check out the Michigan Colleges Online at www.micolegesonline.org for online course options.
Computer Studies - Computer Information Technology - Developer

Associate in Applied Science Degree  NMC Code 108

As everyone and everything becomes networked, the demand for software applications continues to expand. The CIT Developer program targets this need by producing graduates who are effective programmers and solution architects. The Microsoft .NET framework is utilized to deliver practical knowledge of data access and application development, with the goal of getting you as deep as possible into the patterns and practices of modern programming. A solid understanding of good design enables students to easily transition into other development platforms such as Java. Students considering transfer should see an advisor.

General Education Requirements  Credits: 17-18
Communications: ENG 111 and either ENG 112
or ENG 220 ........................................7-8
Humanities: PHL 105 or PHL 202 ......................3
Math competency: Placement into MTH 121 or higher,
or completion of MTH 111
Science: Any Group 1 with a lab ................................4
(PHY 105 recommended)
Social Sciences: Any Group 1 course ..................3
(ECO 201 recommended)

Occupational Specialty Courses  52
BUS 101 Introduction to Business ..................3
BUS 155 Interpersonal Communications ............3
CIT 110 Programming Logic and Design .............3
CIT 178 Relational Databases ........................3
CIT 180 HTML and CSS Programming ..............3
CIT 188 Data Sources ................................3
CIT 190 JavaScript Programming ....................3
CIT 195 .NET Application Programming ............3
CIT 208 Mobile Apps-Responsive Design ............3
CIT 213 Networking Technologies ....................4
CIT 215 Windows Server Environment ...............3
CIT 218 Web App Programming ASP .NET ............3
CIT 233 Project Management ........................3
CIT 255 .NET Object-Oriented Programming .......3
CIT 275 .NET Solutions Development ...............3
CIT 280 Systems Analysis and Design ...............3
CIT 290 CIT Internship .............................3

Program Requirements  69-70

Computer Studies - Developer I

Certificate of Achievement (Level I)  NMC Code 091

The CIT-Developer I Certificate prepares students for the workplace by concentrating on foundational level skills in web, programming and database technologies. Students in this program will have an opportunity to develop a systems portfolio as well as earn several industry recognized certifications.

Certificate Requirements  Credits: 25
CIT 110 Programming Logic and Design ..............3
CIT 178 Relational Databases ........................3
CIT 180 HTML & CSS Programming ................3
CIT 188 Data Sources ................................3
CIT 190 JavaScript Programming ....................3
CIT 195 .NET Application Programming ............3
CIT 210 Microsoft Office - Excel .......................3
CIT 213 Networking Technologies ....................4

Computer Studies - Developer II

Certificate of Achievement (Level III)  NMC Code 093

Students completing the CIT-Developer I Certificate may elect to continue their education and obtain a Level III Certificate. This program prepares students for careers as software and web developers using the latest industry technologies.

Certificate Requirements  Credits: 49
Completion of Developer I Certificate ..................25
BUS 155 Interpersonal Communications ...............3
CIT 208 Mobile Apps-Responsive Design ............3
CIT 215 Windows Server Environment ................3
CIT 218 Web APP Programming ASP .NET ............3
CIT 233 Project Management ........................3
CIT 255 .NET Object-Oriented Programming .......3
CIT 275 .NET Solutions Development ...............3
CIT 280 Systems Analysis & Design ..................3
Computer Studies - Computer Information Technology-Infrastructure

Associate in Applied Science Degree  NMC Code 125

The use of computer technology exists in most industries and can be found in use throughout the world. Businesses need individuals that understand how this technology works and the knowledge to support their computer infrastructure. This degree prepares students by providing them with a comprehensive background in computer hardware, operating system, local area networking, internetwork routing and switching, and cloud computing. This degree prepares students:

• CompTIA A+® IT Certification
• CompTIA Network+® Certification
• CompTIA Security+® Certification
• Cisco CCNA (Cisco Certified Network Associate)
• MCTS - Microsoft Certified Technology Specialist
• MTA - Microsoft Technology Associate

Successful associate degree graduates are qualified for positions as hardware technicians, network administrators, and infrastructure support specialists. Students considering transfer should see an advisor.

General Education Requirements  Credits: 17-18
Communications: ENG 111 and either ENG 112 or ENG 220 ..........................7-8
Humanities: PHL 105 or PHL 202 .............................................3
Math competency: Placement into MTH 121 or higher, or completion of MTH 111
Science: Any Group 1 course with a lab ..................................4
Social Sciences: Any Group 1 course .................................3
(ECO 201 recommended)

Occupational Specialty Courses  52
BUS 155 Interpersonal Communications ..................................3
CIT 156 CompTIA A+® Certification I ..................................3
CIT 157 CompTIA A+® Certification II ..................................3
CIT 160 Cisco Internetworking I ...........................................4
CIT 161 Cisco Internetworking II ...........................................4
CIT 213 Networking Technologies ........................................4
CIT 215 Windows Server Environment ................................3
CIT 233 Project Management ................................................3
CIT 240 Network Security Management ..............................3
CIT 242 Windows Client Administration ................................2
CIT 246 Windows Server Infrastructure ................................3
CIT 247 Enterprise Solutions ...............................................3
CIT 256 Linux Administration ...............................................3
CIT 260 Cisco Internetworking III ...........................................4
CIT 261 Cisco Internetworking IV ...........................................4
CIT 290 CIT Internship* ......................................................3

*Two competencies are required for the Internship course: a 3.0 GPA in CIT classes (with 20 credits and an overall average of 2.0 and department approval), and a keyboarding competency. While a 3.0 GPA in CIT classes is required for this internship, an alternative, campus-based internship opportunity is available for those students who do not meet this requirement.

Program Requirements  69-70

Computer Studies - Infrastructure Specialist I
Certificate of Achievement (Level I)  NMC Code 033

The Infrastructure Specialist I Certificate of Achievement prepares computer professionals to assemble, upgrade, maintain and repair personal computers and work with local area networks. The program is designed to prepare students for the following internationally recognized certifications:

• CompTIA A+® Certification
• CompTIA Network+® Certification
• Microsoft MCTS Certification
• Microsoft MTA Certification

Certificate Requirements  Credits: 18
BUS 155 Interpersonal Communications ...............................3
CIT 242 Windows Client Administration ...............................2

For CompTIA A+® Certification:
CIT 156 CompTIA A+® Certification I .................................3
CIT 157 CompTIA A+® Certification II .................................3

For CompTIA Network+® Certification:
CIT 213 Networking Technologies .......................................4

For Microsoft MCTS Certification:
CIT 215 Windows Server Environment ...............................3

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Computer Studies -
Infrastructure Specialist II

Certificate of Achievement (Level II)  NMC Code 030

Students completing the Infrastructure Specialist I Certificate may elect to continue their education and obtain a Level II Certificate. The Cisco CCNA certification is an industry recognized certification in internetwork routing and switching.

Certificate Requirements  Credits: 34
Completion of Infrastructure Specialist I Certificate...........18
CIT 160 Cisco Internetworking I ..........................4
CIT 161 Cisco Internetworking II .......................4
CIT 260 Cisco Internetworking III .......................4
CIT 261 Cisco Internetworking IV .......................4

Computer Studies -
Infrastructure Specialist III

Certificate of Achievement (Level III)  NMC Code 024

After completing the Infrastructure Specialist II Certificate students may elect to obtain a level III certificate. The CompTIA certification is an industry-recognized certification focusing on computer security.

Certificate Requirements  Credits: 52
Completion of Infrastructure Specialist I Certificate...........18
Completion of Infrastructure Specialist II Certificate .........16
CIT 246 Windows Server Infrastructure ....................3
CIT 247 Enterprise Solutions ...............................3

For CompTIA Security+® Certification:

CIT 240 Network Security Management .................3

Occupational Requirements

CIT 233 Project Management .............................3
CIT 256 Linux Administration .............................3
CIT 290 CIT Internship ..................................3

Computer Studies -
Office Applications Specialist

Certificate of Achievement (Level I)  NMC Code 035

The Office Applications Specialist Certificate helps meet the demand for qualified and knowledgeable people in today's workplace. It helps students to acquire the desktop applications expertise and basic computer skills needed to work more productively and efficiently with Microsoft Office.

This NMC credential also serves to train candidates for the globally recognized Microsoft Specialist series of certifications. NMC is a Microsoft Office approved testing center, and the certification exams are administered at the Aero Park campus. For more information, please call (231) 995-2247.

Certificate Requirements  Credits: 15
BUS 155 Interpersonal Communications .....................3
CIT 119 Microsoft Office - Word ...........................3
CIT 122A Computer and Internet Basics I .................1
CIT 124 Microsoft Office - PowerPoint ..................2
CIT 170 Microsoft Office - Access ........................3
CIT 210 Microsoft Office - Excel ..........................3

Note: Students selecting this certificate program need beginning keyboarding skills.

Computer Studies -
Computer Support Specialist

Certificate of Achievement (Level III)  NMC Code 006

Students complete course work in business and computer operations leading to a certificate. This program is designed to provide students with the necessary skills to work as support specialist or computer technician. Students will have an opportunity to acquire skills using current operating system and application software and gain experience using Local Area Networks. Students will also learn troubleshooting methodologies and develop project management skills.

Certificate Requirements  Credits: 48
Completion of Office Applications Specialist Certificate . . .15
BUS 105 Business Math ....................................3
BUS 231 Professional Communications ..................3
CIT 156 CompTIA A+ Certification I ......................3
CIT 157 CompTIA A+ Certification II ....................3
CIT 213 Networking Technologies ........................4
CIT 215 Windows Server Environment ...................3
CIT 233 Project Management .............................3
CIT 242 Windows Client Administration ..................2
CIT 292 Support Specialist Internship ....................3
ENG 220 Technical Writing ...............................3
PHL 105 Critical Thinking ................................3

Note: Students selecting this certificate program need beginning keyboarding skills.
Computer Studies - Industry Certifications

For additional information on testing and/or training for any of the certification opportunities listed below, please call (231) 995-1169 or email CIT@nmc.edu. NMC is an authorized Certiport, Pearson-VUE, and Prometric testing center.

Cisco CCNA Certification – The CCNA certification (Cisco Certified Network Associate) indicates a foundation in, and apprentice knowledge of networking. CCNA certified professionals can install, configure, operate LAN, WAN and dial access services for small networks (100 nodes or fewer), including but not limited to use of these protocols: IP, EIGRP, OSPF, Frame Relay, IP RIP, VLANs Rip, Ethernet, Access Lists.

Cisco Internetworking I through Cisco Internetworking IV are courses offered by the NMC Cisco Networking Academy and provide training for the CCNA Exam.

CiW Site Development Associate – Validates technical competency in the latest HTML and CSS technologies. HTML and CSS Programming and JavaScript Programming are NMC courses that provide the necessary preparation to pass the CiW Site Development Associate certification.

CompTIA A+® Certification – The CompTIA A+® certification is the industry standard for validating vendor-neutral skills expected of an entry-level IT technician. CompTIA A+® Certification I and CompTIA A+® Certification II are NMC courses and provide the necessary preparation to pass the A+ Essentials and A+ IT Technician Certification exams.

**CompTIA Network+ Certification** – The CompTIA Network+® certification validates technical competency in network infrastructure and support. Those holding Network+ certification demonstrate critical knowledge of network concepts, network installation and configuration, network media and topologies, network management and network security. Network Technologies is an NMC course that provides the necessary preparation to pass the Network+ Certification exam.

**CompTIA Security+ Certification** - The CompTIA Security+® certification tests for security knowledge of an individual with experience in networking. The CompTIA Security+® certification validates technical competency in security and covers industry-wide topics, including networking security, compliance and operational security, threats and vulnerabilities, application, data and host security, access control and identity management, and cryptography. Network Security Management is an NMC course that provides the necessary preparation to pass the Security+ Certification exam.

**Microsoft® IT Academy Program Member**

**Microsoft Certified Technology Specialist (MCTS)** – is an internationally recognized Microsoft certification. Windows Server Environment is an NMC course that provides the necessary preparation to pass the Microsoft MCTS 70-410 certification exam.

**Microsoft Office Specialist** – Microsoft Office Specialist certification proves expertise in Microsoft applications. Holders of these credentials stand out as truly knowledgeable people. Microsoft Office-Word, Microsoft Office-Excel, Microsoft Office-PowerPoint and Microsoft Office-Access are NMC courses that provide the necessary preparation to pass Microsoft Office Specialist certifications.

**Microsoft Technology Associate** – Microsoft Technology Associate (MTA) certification is an entry-level credential from Microsoft that validates essential technology knowledge, enabling students to explore academic and career options, and take the first step toward building a successful career in technology. MTA certifications are embedded into the CIT Developer, and CIT Infrastructure degree programs and certificates.
Computer Studies - Web Developer I

Certificate of Achievement (Level I)  NMC Code 039

This series of Web Developer certificates provides an introduction to both website design and website development. Visual Communication courses enable students to create visually effective sites using graphic design principles and tools. Information Technology courses provide the technical ability to develop interactive, data-driven sites and applications. Students interested in this profession are usually detail and result oriented, self-directed and enjoy working with both people and technology. The certificates may be completed as stand-alone certificates, taken in order, or applied to electives or major area requirements for an Associate in General Studies or an Associate in Applied Science.

Level I Certificate Requirements  Credits: 21

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 131</td>
<td>2-D Design</td>
<td>3</td>
</tr>
<tr>
<td>CIT 110</td>
<td>Programming Logic and Design</td>
<td>3</td>
</tr>
<tr>
<td>CIT 180</td>
<td>HTML and CSS Programming</td>
<td>3</td>
</tr>
<tr>
<td>CIT 190</td>
<td>JavaScript Programming</td>
<td>3</td>
</tr>
<tr>
<td>VCA 127</td>
<td>Digital Imaging</td>
<td>3</td>
</tr>
<tr>
<td>VCA 147</td>
<td>Web Design I</td>
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</tr>
<tr>
<td>VCA 150</td>
<td>Digital Graphic Design I</td>
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</table>

Computer Studies - Web Developer II

Certificate of Achievement (Level II)  NMC Code 040

Prerequisites: Completion of all Web Developer Certificate Level I courses (21 credits)

Level I Certificate Requirements  Credits: 21

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>BUS 231</td>
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<td>BUS 155</td>
<td>Interpersonal Communications</td>
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<tr>
<td>CIT 178</td>
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<td>3</td>
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<tr>
<td>CIT 195</td>
<td>.NET Applications Programming</td>
<td>3</td>
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<tr>
<td>CIT 208</td>
<td>Mobile Apps-Responsive Design</td>
<td>3</td>
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<tr>
<td>VCA 125</td>
<td>Typography I</td>
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<td>VCA 146</td>
<td>Interactive Animation</td>
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</tbody>
</table>

Computer Studies - Web Developer III

Certificate of Achievement (Level III)  NMC Code 041

Prerequisites: Completion of all Web Developer Certificate Level I (21 credits) and Level II (18 credits) courses.

Level I Certificate Requirements  Credits: 21

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<td>Data Sources</td>
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<td>CIT 218</td>
<td>Web APP Programming ASP .NET</td>
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<tr>
<td>CIT 255</td>
<td>.NET Object-Oriented Programming</td>
<td>3</td>
</tr>
<tr>
<td>CIT 291</td>
<td>Web Developer Internship*</td>
<td>3</td>
</tr>
<tr>
<td>VCA 246</td>
<td>Interactive Animation II or</td>
<td></td>
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<tr>
<td>VCA 247</td>
<td>Web Design II</td>
<td></td>
</tr>
</tbody>
</table>

*Two competencies are required for the Internship course: a 3.0 GPA in CIT classes (with 20 credits and an overall average of 2.0 and department approval), and a keyboarding competency.

While a 3.0 GPA in CIT classes is required for this internship, an alternative, campus-based internship opportunity is available for those students who do not meet this requirement.

NMC. Find it here.
Construction Technology -
Carpentry Technology

Certificate of Achievement (Level I)  
**NMC Code 061**

Skilled carpenters must knowledgeably use specialized tools; read blueprints; frame structures; install doors, windows, cabinets, insulation, and finish trim; and construct roofs, decks, and stairways. Being versatile opens a wide range of employment opportunities. The curriculum is designed by the industry and aligned with national competency standards. Students receive hands on training in our state-of-the-art facilities. Information: (231) 995-2777.

**Certificate Requirements**  
**Credits: 19**

- CAR 101 Introduction to Carpentry ........................................ 3
- CAR 103 Construction Blueprint Reading .................................. 3
- CAR 105 Foundations and Framing ........................................... 3
- CAR 121 Exterior Construction .................................................. 3
- CAR 125 Interior Construction .................................................. 3
- CMT 107 Construction Supervision ......................................... 4

**Construction Technology -
Electrical Technology**

Certificate of Achievement (Level I)  
**NMC Code 062**

Qualified electricians install, troubleshoot, and repair electrical systems in residential and commercial settings. There is high demand for well-trained electricians nationwide. The curriculum is designed by the industry and aligned with national competency standards. Students receive hands-on training in our state-of-the-art facilities. This certificate program is approved by the State of Michigan to meet the electrical apprenticeship requirements. Information: (231) 995-2777.

**Certificate Requirements**  
**Credits: 24**

- ELE 101 Introduction to Electrical ........................................... 3
- ELE 105 Beg. Residential Electrical .......................................... 3
- ELE 121 Adv. Residential Electrical ......................................... 3
- ELE 125 Pre-Commercial Electrical ......................................... 3
- ELE 131 Commercial Electrical .................................................. 3
- ELE 135 Adv. Commercial Electrical ......................................... 3
- ELE 142 Industrial Electrical .................................................... 3
- ELE 146 Adv. Industrial Electrical ............................................. 3

Construction Technology -
Facilities Maintenance

Certificate of Achievement (Level II)  
**NMC Code 063**

Performing facilities maintenance requires knowledge in several areas. This level II certificate covers reading blueprints, general carpentry, tools of the trade, electrical wiring and schematics, and thermodynamics of refrigeration. Also required will be 14 technical elective credits that can range from drafting to alternative energy integration into a facility. The curriculum is designed by the industry and aligned with national competency standards. Students receive hands on training in our state-of-the-art facilities. Information: (231) 995-2777.

**Certificate Requirements**  
**Credits: 32**

- CAR 101 Introduction to Carpentry ........................................... 3
- CAR 105 Foundations and Framing ........................................... 3
- ELE 101 Introduction to Electrical .......................................... 3
- ELE 105 Beg. Residential Electrical ......................................... 3
- HVA 101 Introduction to HVAC/R ............................................. 3
- HVA 106 Fundamentals of Heating .......................................... 3
- PLU 101 Introduction to Plumbing ........................................... 3
- PLU 105 Plumbing Components .............................................. 3
- Construction Technology Electives

(See Elective list on page 32) ...................................................... 8

Construction Technology -
HVAC/R Technology

Certificate of Achievement (Level I)  
**NMC Code 064**

There is high demand for qualified technicians in the heating and cooling industry. HVAC/R technicians install, maintain, and repair heating, ventilating, air-conditioning, and refrigeration systems. Because of continuing demand, HVACR technicians can usually find employment with good beginning salaries. The curriculum is designed by the industry and aligned with national competency standards. Students receive hands on training in our state-of-the-art facilities. Information: (231) 995-2777.

**Certificate Requirements**  
**Credits: 18**

- HVA 101 Introduction to HVAC/R ............................................. 3
- HVA 106 Fundamentals of Heating .......................................... 3
- HVA 122 Basic Refrigeration Fundamentals ................................ 3
- HVA 126 Residential and Commercial A/C ................................ 3
- HVA 132 Commercial A/C and Refrigeration ................................ 3
- HVA 136 EPA Certification ..................................................... 3

Find it here.
Construction Technology - Programmable Logic Controllers (PLC)

Certificate of Achievement (Level I)  NMC Code 076

Trained personnel who design, program, operate, service and maintain these devices are performing duties that fit the job description of a programmable logic controller technician. They have the technical knowledge to set up electronic control systems for mechanical equipment, including integrating electrical wiring requirements to pneumatic and hydraulic systems. They also will learn system monitoring, debugging and troubleshooting operational problems, making repairs and performing preventive maintenance activities. There is a very high demand for trained individuals in this field as many industries have automated processes in which equipment and machines are computer-controlled. The curriculum is designed by industry experts to meet employer demands. Students receive hands-on training in our state-of-the-art science lab. For more information call (231) 995-2777.

Certificate Requirements  Credits: 18
EET 103  Electrical Studies ........................................3
EET 104  Electrical Studies ........................................3
EET 221  Industrial Controls ........................................3
EET 232  Programmable Logic Controllers ....................3
EET 233  PLC Applications I ......................................3
EET 234  PLC Applications II ...................................3

Construction Technology - Renewable Energy Technology- Electrical

Certificate of Achievement (Level II)  NMC Code 065

Construction Technology - Renewable Energy Technology- Electrical

Assocate in Applied Science Degree  NMC Code 655

Renewable energy is one of the most vital resources of the 21st century. NMC offers professional certificates and an Associate of Applied Science degree in this exciting, growing field. This degree focuses on how to harness wind and solar-generated electricity and its use by residential consumers and utilities. Among the NMC resources you’ll use in the program are: mobile solar lab, four wind turbines (located at the University Center and Aero Park campuses), and 8 kw, grid-interconnected solar array. Information: (231) 995-2777.

General Education Requirements  Credits: 21-22
Communications: ENG 111 and either BUS 231 or ENG 112 or ENG 220 ..............................................................7-8
Humanities: PHL 202 .......................................................3
Math competency: Placement into MTH 140 or higher, or completion of MTH 121 ...................................................4
Science: ENV 103 or ENV 117 or PHY 121 ....................4
Social Sciences: Any Group 1 course ............................3

Technical Core Requirements  9
EGY 101  Principles of Renewable Energy ...................3
EGY 105  Sustainable Building Design .........................3
EGY 115  Residential Energy Efficiency .......................3
EGY 141  Solar Photovoltaic Technology I ...............3
EGY 161  Wind Power Technology ............................3
ELE 101  Introduction to Electrical ..........................3
ELE 105  Beg. Residential Electrical ..........................3
ELE 121  Adv. Residential Electrical ..........................3
ELE 125  Pre-Commercial Electrical ..........................3
MTH 111  Intermediate Algebra .................................4
Construction Technology Electives
(See Elective list on page 32) .......................................8

Program Requirements  60

NMC.
Find it here.
Construction Technology - Renewable Energy Technology- HVAC

Associate in Applied Science Degree  NMC Code 656

Renewable Energy Technology - HVAC/R (heating, ventilation, air conditioning and refrigeration) emphasizes the use of solar and geo-thermal energy production in heating and cooling in residential applications. Among the NMC resources you’ll use in the program are: mobile solar lab, geothermal heat pump lab, solar thermal system and 8 kw, grid-interconnected solar array. Information: (231) 995-2777.

General Education Requirements  Credits: 21-22

Communications: ENG 111  and either BUS 231  or ENG 220……………………………………7-8
Humaneites: PHL 202  ………………………………………3
Math competency: Placement into MTH 140  or higher, or completion of MTH 121 …………………4
Science: ENV 117  or PHY 121  or ENV 103………………4
Social Sciences: Any Group 1 course …………………3

Technical Core Requirements  9

EGY 101  Principles of Renewable Energy………………3
EGY 105  Sustainable Building Design………………3
EGY 115  Residential Energy Efficiency………………3

HVAC Track Requirements  18

EGY 143  Solar Thermal Technology I …………………3
EGY 145  Geothermal Technology …………………3
HVA 101  Introduction to HVAC/R,… …………………3
HVA 106  Fundamentals of Heating …………………3
HVA 122  Basic Refrigeration Fundamentals …………………3
HVA 126  Residential and Commercial A/C …………………3

Construction Technology Electives
(See Elective list in right column)…………………………12

Program Requirements  60

Construction Technology - Renewable Energy Technology- HVAC

Certificate of Achievement (Level II)  NMC Code 066

Certificate Requirements  Credits: 34

EGY 101  Principles of Renewable Energy………………3
EGY 105  Sustainable Building Design………………3
EGY 115  Residential Energy Efficiency………………3
EGY 143  Solar Thermal Technology I …………………3
EGY 145  Geothermal Technology …………………3
HVA 101  Introduction to HVAC/R,… …………………3
HVA 106  Fundamentals of Heating …………………3
HVA 122  Basic Refrigeration Fundamentals …………………3
HVA 126  Residential and Commercial A/C …………………3
MTH 111  Intermediate Algebra…………………………4

Construction Technology Electives
(See Elective list in right column)…………………………3

*Denotes courses with required prerequisites

Construction Technology

Approved Electives  Credits

CAR 101  Introduction to Carpentry…………………………3
CAR 102  Intro to Woodworking…………………………3
CAR 103  Construction Blueprint Reading…………………………3
CAR 105  Foundations and Framing…………………………3
CAR 121  Exterior Construction…………………………3
CAR 125  Interior Construction…………………………3
CMT 107  Construction Supervision…………………………4
CMT 207  Construction Cost Estimating…………………………3
EET 103  Electrical Studies I…………………………3
EET 104*  Electrical Studies II…………………………3
EET 221*  Industrial Controls…………………………3
EET 232*  Programmable Logic Controllers…………………………3
EET 233*  PLC Applications I…………………………3
EET 234*  PLC Applications II…………………………3
EGY 101  Principles of Renewable Energy…………………………3
EGY 105  Sustainable Building Design…………………………3
EGY 115  Residential Energy Efficiency…………………………3
EGY 141*  Solar Photovoltaic Technology I…………………………3
EGY 143  Solar Thermal Technology I…………………………3
EGY 145  Geothermal Technology…………………………3
EGY 151  Solar Photovoltaic Technology II…………………………3
EGY 161  Wind Power Technology…………………………3
ELE 101  Intro to Electrical…………………………3
ELE 105  Beg. Residential Electrical…………………………3
ELE 110*  Electrical Code Studies I…………………………3
ELE 111*  Electrical Code Studies II…………………………3
ELE 121  Adv. Residential Electrical…………………………3
ELE 125  Pre-Commercial Electrical…………………………3
ELE 131  Commercial Electrical…………………………3
ELE 135  Adv. Commercial Electrical…………………………3
ELE 142  Industrial Electrical…………………………3
ELE 146  Adv. Industrial Electrical…………………………3
HVA 101  Introduction to HVAC/R…………………………3
HVA 106*  Fundamentals of Heating…………………………3
HVA 122*  Basic Refrigeration Fundamentals…………………………3
HVA 126*  Residential and Commercial A/C…………………………3
HVA 132*  Commercial A/C and Refrigeration…………………………3
HVA 136  EPA Certification…………………………3
PLU 101  Introduction to Plumbing…………………………3
PLU 105*  Plumbing Components…………………………3
PLU 121*  Commercial Plumbing…………………………3
PLU 125*  Plumbing Installation…………………………3
WPT 110  Oxy-Fuel Process…………………………3

To apply, use the three-digit NMC Code on your admissions application.

NMC Find it here. 
Culinary Arts
Great Lakes Culinary Institute

Associate in Applied Science Degree  NMC Code 109

The Great Lakes Culinary Institute believes in the principle of learning by doing. Extensive hands-on training will give students a competitive advantage in this highly competitive field.

This program is designed to provide rigorous and concentrated study for those students who plan careers in the rapidly-growing food service industry. The program’s main emphasis is to prepare students for entry-level chef and kitchen management positions. Consideration is given to the science and techniques associated with the selection, preparation, and serving of foods to large and small groups.

The Great Lakes Culinary Institute’s facility is located on NMC’s Great Lakes Campus. It is comprised of five culinary labs including a bakery, introductory and food skills kitchen, an advanced cooking kitchen, a garde manger kitchen, an á la carte kitchen, and Lobdell’s, a 90-seat training restaurant. Upon graduation, students will have an unbeatable combination of knowledge, skills, and work experience.

The Great Lakes Culinary Institute is accredited by the American Culinary Federation. The Institute has been awarded Exemplary Program designation by the American Culinary Federation.

Note: Admission to the Culinary Arts program requires COMPASS test scores of Writing 70, Reading 82 or co-requisite of ENG 111 + 11, and Pre-Algebra 21. All culinary students are required to take CUL 100. A waiver may be obtained by documenting attendance at a career technical center with a minimum GPA of 2.5 and/or relevant industry experience. Students must submit appropriate documentation to director of the Great Lakes Culinary Institute at least two weeks prior to the start of the semester they plan to attend.

General Education Requirements  Credits: 17-18
Communications: ENG 111 and either BUS 231 or ENG 112 ..................................................7-8
Humanities: Any Group 1 course ....................................3
Math competency: Placement into MTH 111 or higher, or completion MTH 23 or MTH 23A and MTH 23B
Science: Any Group 1 course with a lab.........................4
Social Sciences: Any Group 1 course .........................3

Occupational Specialty Requirements  57
CIT 100 Computers in Business-An Intro ..................3
CUL 100 Intro to Professional Cookery ...................1
CUL 101 Today’s Hospitality Industry ........................3
CUL 110 Safety and Sanitation ................................2
CUL 111 Professional Cookery ................................6
CUL 118 Introduction to Baking ................................4
CUL 121 Purchasing and Receiving ..........................2
CUL 190 Culinary Internship ..................................3
CUL 210 Nutrition for Culinary Arts .........................2
CUL 211 Menu Planning .......................................3
CUL 213 World Cuisine .........................................6
CUL 215 Garde Manger .........................................4
CUL 217 Kitchen and Dining Room Mgmt ................3
CUL 218 Advanced Baking .....................................4
CUL 295 Contemporary Service & Cuisine ................12

Program Requirements  74-75

Culinary Arts
Great Lakes Culinary Institute

Certificate of Achievement (Level III)  NMC Code 029

Certificate Requirements  Credits: 54
CUL 100 Intro to Professional Cookery ....................1
CUL 101 Today’s Hospitality Industry .....................3
CUL 110 Safety and Sanitation ................................2
CUL 111 Professional Cookery ................................6
CUL 118 Introduction to Baking ................................4
CUL 121 Purchasing and Receiving ..........................2
CUL 190 Culinary Internship ..................................2
CUL 210 Nutrition for Culinary Arts .........................2
CUL 211 Menu Planning .......................................3
CUL 213 World Cuisine .........................................6
CUL 215 Garde Manger .........................................4
CUL 217 Kitchen and Dining Room Mgmt ................3
CUL 218 Advanced Baking .....................................4
CUL 295 Contemporary Service and Cuisine ............12

American Culinary Federation
The Standard of Excellence for Chefs

www.nmc.edu  |  33
**Dental Assistant**

**Associate in Applied Science Degree**  
*NMC Code 300*

Dental Assistants are members of a highly qualified health care team whose varied duties require knowledge of the basic dental sciences, proficiency in laboratory and clinical skills, and practical experience in meeting patient needs. Both the associate and the certificate programs are accredited by the Commission on Dental Accreditation (CODA) and approved by the Michigan Board of Dentistry. Completion of the program qualifies students for the state board exam and after passing the exam, they may practice as Registered Dental Assistants. In addition, program completers are eligible for the National Certification exam which is recognized nationwide.

Few jobs offer the diversity and flexibility found in dental assisting. While most dental assistants work as chairside or business assistants in general or specialty dental practices such as orthodontics or oral surgery, other career paths include the following: lab technicians; sales representatives in dental supply companies; and as teachers in vocational or college dental auxiliary programs.

Enrollment in any Dental Assistant (HDA) course requires admission to the dental assistant program OR approval from the dental assistant program director.

The following are required for admission:
1. High school or post secondary degree, 2.0 minimum GPA, or successful GED completion
2. Mathematics: MTH 23* or MTH 23A and MTH 23B or placement into MTH 111 or higher
3. Communications: Placement into ENG 111 or higher.  
   *MTH 23 credits do not count toward degree requirements.*

**General Education Requirements**  
*Credits: 18*

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>ENG 111</td>
<td>Communications</td>
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<tr>
<td>ENG 112</td>
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<tr>
<td>BUS 155</td>
<td>Interpersonal Communications</td>
<td>4</td>
</tr>
<tr>
<td>HAH 120</td>
<td>Infection Control</td>
<td>2</td>
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<tr>
<td>HDA 101</td>
<td>Introduction to Dentistry</td>
<td>2</td>
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<tr>
<td>HDA 112</td>
<td>Dental Materials</td>
<td>2</td>
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<td>HDA 113</td>
<td>Dental Materials Lab</td>
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<tr>
<td>HDA 120</td>
<td>Dental Anatomy</td>
<td>3</td>
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<tr>
<td>HDA 140</td>
<td>Oral Pathology/Pharmacology</td>
<td>2</td>
</tr>
<tr>
<td>HDA 150</td>
<td>Dental Office Management</td>
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<td>HDA 160</td>
<td>Dental Emergencies</td>
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<td>HDA 170</td>
<td>Preventive Dentistry</td>
<td>2</td>
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<td>HDA 240</td>
<td>Chairside Procedures</td>
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<tr>
<td>HDA 241</td>
<td>Chairside Procedures Lab</td>
<td>2</td>
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<td>HDA 242</td>
<td>Dental Radiography</td>
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<td>HDA 243</td>
<td>Dental Radiography Lab</td>
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<td>HDA 251</td>
<td>Dental Assistant Internship I</td>
<td>4</td>
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<td>HDA 252</td>
<td>Dental Assistant Internship II</td>
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<td>HDA 282</td>
<td>CDA/RDA Written Exam Prep</td>
<td>2</td>
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<td>HDA 286</td>
<td>RDA Clinical Exam Prep</td>
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<tr>
<td>HPD 110</td>
<td>Basic Life Support for Health Care Providers</td>
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*Note: A 2.0 grade or higher is required in HDA & HAH courses.*

**Program Requirements**  
*60-61*
**Dental Assistant**

**Certificate of Achievement (Level II)**  NMC Code 070

The following coursework must be taken in order to qualify for the Certificate of Achievement in Dental Assisting. Completion of the program qualifies students for the state board exam and after passing the exam, they may practice as Registered Dental Assistants. In addition, program completers are eligible for the National Certification exam which is recognized nationwide. While the associate degree is not required for either of these exams, students can complete the associate degree after completion of the certificate.

**Admission Requirements**

Enrollment in any Dental Assistant (HDA) course requires admission to the dental assistant program OR approval from the dental assistant program director.

The following are required for admission:

1. High school or post secondary degree, 2.0 minimum GPA, or successful GED completion
2. Mathematics: MTH 23* or MTH 23A and MTH 23B or placement into MTH 111 or higher
3. Communications: Placement into ENG 111 or higher.

*MTH 23 and ENG 99 credits do not count toward degree requirements.

**Placement Requirements (to complete certificate)**

Math competency: Placement into MTH 111 or higher, or completion of MTH 23 or MTH 23A and MTH 23B

Communications: Placement into ENG 111 or higher ...

**Certificate of Achievement**  Credits: 42-43

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<thead>
<tr>
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<td>COM 111</td>
<td>Public Speaking</td>
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</tr>
<tr>
<td>HAH 120</td>
<td>Infection Control</td>
<td>2</td>
</tr>
<tr>
<td>HDA 101</td>
<td>Introduction to Dentistry</td>
<td>2</td>
</tr>
<tr>
<td>HDA 111</td>
<td>Dental Materials</td>
<td>2</td>
</tr>
<tr>
<td>HDA 113</td>
<td>Dental Materials Lab</td>
<td>1</td>
</tr>
<tr>
<td>HDA 120</td>
<td>Dental Anatomy</td>
<td></td>
</tr>
<tr>
<td>HDA 130</td>
<td>Dental Radiology</td>
<td>2</td>
</tr>
<tr>
<td>HDA 140</td>
<td>Oral Pathology/Pharmacology</td>
<td>2</td>
</tr>
<tr>
<td>HDA 150</td>
<td>Dental Office Management</td>
<td>2</td>
</tr>
<tr>
<td>HDA 160</td>
<td>Dental Emergencies</td>
<td>1</td>
</tr>
<tr>
<td>HDA 170</td>
<td>Preventive Dentistry</td>
<td>2</td>
</tr>
<tr>
<td>HDA 240</td>
<td>Chairside Procedures</td>
<td>5</td>
</tr>
<tr>
<td>HDA 241</td>
<td>Chairside Procedures Lab</td>
<td>2</td>
</tr>
<tr>
<td>HDA 242</td>
<td>Dental Radiography</td>
<td>2</td>
</tr>
<tr>
<td>HDA 243</td>
<td>Dental Radiography Lab</td>
<td>1.5</td>
</tr>
<tr>
<td>HDA 251</td>
<td>Dental Assistant Internship I</td>
<td>4</td>
</tr>
<tr>
<td>HDA 252</td>
<td>Dental Assistant Internship II</td>
<td>4</td>
</tr>
<tr>
<td>HDA 282</td>
<td>CDA/RDA Written Exam Prep</td>
<td>2</td>
</tr>
<tr>
<td>HDA 286</td>
<td>RDA Clinical Exam Prep</td>
<td>1</td>
</tr>
<tr>
<td>HPD 110</td>
<td>Basic Life Support for Health Care Providers</td>
<td>0.2</td>
</tr>
</tbody>
</table>

**Note:** 2.0 grade or higher is required in HDA, HAH courses.

---

**Early Childhood Education**

**Associate in Applied Science Degree**  NMC Code 321

This program prepares students for the challenges of the ever-changing world of early care and education. Specialized courses and liberal arts studies provide students with a foundation needed to pursue careers in early childhood education, childcare, and preschool education. The order in which courses are taken is not critical except where prerequisites are involved. Course substitutions may be made only with the approval of the program coordinator or the academic area chair.

Students planning to pursue a four-year degree in Child Development or Early Childhood Education should follow NMC’s degree requirements for the ASA degree and familiarize themselves with the requirements of the school of choice for their bachelor degree.

**General Education Requirements**  Credits: 17-18

Communications: ENG 111 and either BUS 231 or ENG 112 ........................................7-8

Humanities: ENG 210 ........................................3

Math competency: Placement into MTH 111 or higher, or completion of MTH 23 or MTH 23A and MTH 23B

Science: Any Group 1 course with a lab..............................................4

Social Sciences: PSY 101 ...........................................3

**Occupational Specialty Requirements**  41-42

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD 101</td>
<td>Early Childhood Education</td>
<td>3</td>
</tr>
<tr>
<td>CD 202</td>
<td>Human Growth and Development</td>
<td>5</td>
</tr>
<tr>
<td>CD 203</td>
<td>Guiding Young Children</td>
<td>3</td>
</tr>
<tr>
<td>CD 204</td>
<td>Early Childhood Curriculum</td>
<td>3</td>
</tr>
<tr>
<td>CD 206</td>
<td>Infant/Toddler Development</td>
<td>3</td>
</tr>
<tr>
<td>CD 220</td>
<td>Childhood Program Management</td>
<td>3</td>
</tr>
<tr>
<td>CD 230</td>
<td>Early Language and Literacy</td>
<td>3</td>
</tr>
<tr>
<td>CD 290</td>
<td>Service Learning Internship</td>
<td>3-4</td>
</tr>
<tr>
<td>PSY 212</td>
<td>Psychology/Exceptional Child</td>
<td>3</td>
</tr>
<tr>
<td>SOC 101</td>
<td>Introduction to Sociology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 211</td>
<td>Marriage and the Family</td>
<td>3</td>
</tr>
</tbody>
</table>

General Elective: 2 courses ...........................................6

**Program Requirements**  Minimum credit hours: 60
Early Childhood Education and Care

Certificate of Achievement (Level I)

Infant and Toddler ........................................ NMC Code 042
Pre-School .................................................. NMC Code 043

These certificates are designed to meet the National CDA credentialing requirements for students currently employed working with young children. These courses are approved by the National CDA (Child Development Associates Credentialing) program, which means that they meet the requirements for professional development hours in the various functional areas. Receiving NMC's Certificate of Achievement (Level I) qualifies individuals to meet the Early Childhood Lead Teacher requirements for the State of Michigan Licensing Rules for Child Care Centers.

This CDA credential sequence is designed as a building block program, which means that by adding certain additional courses, students may meet Michigan Child Care Licensing requirements for Program Manager, complete the certificate or get an AAS in Early Childhood Education.

These certificates are designed to complete the application requirements for the National CDA credentials process in the first semester and support successful completion of the National CDA credential in the second semester.

Early Childhood Education and Care Certificate of Achievement Outcomes:

Students completing the Early Childhood Education and Care Certificate are able to reliably demonstrate a working knowledge of child development from conception to twelve years of age; possess observation skills and tools to assess, evaluate, and build individualized plans for children; apply curriculum development knowledge to provide age appropriate/multi-cultural activities and materials; apply environmental design knowledge; possess working knowledge of program management and philosophy building; apply knowledge in working with families, including diverse/multicultural systems.

Early Childhood Education for Preschool (Center Based):

<table>
<thead>
<tr>
<th>Certificate Requirements</th>
<th>Credits: 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD 101 Early Childhood Education .................................. 3</td>
<td></td>
</tr>
<tr>
<td>CD 202 Human Growth and Development .............................. 5</td>
<td></td>
</tr>
<tr>
<td>CD 203 Guiding Young Children or ................................. 3</td>
<td></td>
</tr>
<tr>
<td>CD 290 Service Learning Internship* .............................. 3</td>
<td></td>
</tr>
</tbody>
</table>

Early Childhood Education for Infant & Toddler (Center Based):

<table>
<thead>
<tr>
<th>Certificate Requirements</th>
<th>Credits: 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD 101 Early Childhood Education .................................. 3</td>
<td></td>
</tr>
<tr>
<td>CD 202 Human Growth and Development .............................. 5</td>
<td></td>
</tr>
<tr>
<td>CD 206 Infant/Toddler Development ................................. 3</td>
<td></td>
</tr>
<tr>
<td>CD 290 Service Learning Internship* .............................. 3</td>
<td></td>
</tr>
</tbody>
</table>

* The Service Learning Internship credits are split between two semesters and meet some of the requirements for observation and demonstration for the CDA credential verification visit.

Early Childhood Education and Care

Certificate of Achievement (Level II) NMC Code 002

Receiving NMC’s Certificate of Achievement (Level II) in Early Childhood Education and Care qualifies individuals to meet the Early Childhood Program Director requirements for the State of Michigan Licensing Rules for Child Care Centers. In addition, the following classes are approved by the National Child Development Associates (CDA) Program. Students completing NMC’s Early Childhood Education and Care certificate program and the CDA credentialing process will meet qualifications for Michigan’s Licensing Rules for Early Childhood and/or School Age Care Program Director.

Students are encouraged to work closely with the Early Childhood coordinator to complete this certificate. A 2.0 GPA must be maintained to receive the certificate.

This program is designed to be a building block program. By adding certain courses, a student may complete the requirements for an associate’s degree and students may transfer to a college or university to complete a bachelor’s degree. Students may also elect to stay in Traverse City and transfer to the University Center.

Early Childhood Education and Care Certificate of Achievement Outcomes:

Students completing the Early Childhood Education and Care Certificate will be able to reliably demonstrate a working knowledge of child development from conception to twelve years of age; possess observation skills and tools to assess, evaluate, and build individualized plans for children; apply curriculum development knowledge to provide age appropriate/multi-cultural activities and materials; apply environment design knowledge; demonstrate a working understanding of special need children/families in inclusion/self-contained classrooms; possess working knowledge and skills in discipline management, development of self-esteem and prosocial behaviors; apply knowledge of program management and philosophy building; apply knowledge in working with families, including diverse/multi-cultural systems.

<table>
<thead>
<tr>
<th>Certificate Requirements</th>
<th>Credits: 35-36</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD 101 Early Childhood Education .................................. 3</td>
<td></td>
</tr>
<tr>
<td>CD 202 Human Growth and Development .............................. 5</td>
<td></td>
</tr>
<tr>
<td>CD 203 Guiding Young Children ....................................... 3</td>
<td></td>
</tr>
<tr>
<td>CD 204 Early Childhood Curriculum ................................... 3</td>
<td></td>
</tr>
<tr>
<td>CD 206 Infant/Toddler Development .................................. 3</td>
<td></td>
</tr>
<tr>
<td>CD 220 Childcare Program Management ................................ 3</td>
<td></td>
</tr>
<tr>
<td>CD 230 Early Language and Literacy ................................... 3</td>
<td></td>
</tr>
<tr>
<td>CD 290 Service Learning Internship* ................................ 2-3</td>
<td></td>
</tr>
<tr>
<td>ENG 111 English Composition .......................................... 4</td>
<td></td>
</tr>
<tr>
<td>PSY 101 Intro to Psychology ........................................... 3</td>
<td></td>
</tr>
<tr>
<td>PSY 212 Psychology/Exceptional Child ............................... 3</td>
<td></td>
</tr>
</tbody>
</table>

Placement into MTH 111 or higher, or completion of MTH 23 or MTH 23A and MTH 23B

* This internship can be split over more than one semester.
Engineering Technology

Associate in Applied Science Degree

Computer Technology ........................................ NMC Code 545
Electronics Technology ................................. NMC Code 557
General Technology ........................................ NMC Code 556
Marine Technology ..................................................... NMC Code 541
Photonics Technology ........................................ NMC Code 559
Robotics & Automation Technology ..................... NMC Code 544
Unmanned Aerial Systems Technology .................. NMC Code 542
Unmanned Ground Vehicles Technology .................. NMC Code 543

Engineering technology education focuses primarily on the applied aspects of science and engineering aimed at preparing graduates for practice in that portion of the technological spectrum closest to product improvement, manufacturing, construction, and engineering operational functions.

The NMC Engineering Technology degree offers students a broad based curriculum across all areas of technical education, preparing the graduates for emerging job markets and highly technical fields. The program is designed to allow students to focus on areas of interest or specialize in seven specializations: General Technology, Computer Technology, Electronics Technology, Photonics Technology, Robotics & Automation Technology, Unmanned Aerial Systems (UAS) Technology, Marine (ROV) Technology, Unmanned Ground Vehicles (UGV) Technology.

Industry standards may require that students have First Aid/CPR certification and HAZWOPER certification.

General Education Requirements Credits: 21-22

Communications: ENG 111 and ENG 112 or ENG 220 or BUS 231 .................................................. 7-8
Humanities: PHL105 ................................................................ 3
Math competency: Placement into MTH 140 or higher, or completion of MTH 121 ........................................... 4
Science: PHY 105 ................................................................ 4
Social Science: GEO 115 .................................................... 3

Technical Specialty Requirements Credits: 22

CIT 110 Programming Logic & Design ...................... 3
DD 170 CADD/Computer Modeling .......................... 4
EET 102 Intro to Engineering Technology .................. 2
EET 103 Electrical Studies I ......................................... 3
MFG 103 Manufacturing Processes ......................... 3
MFG 104 Fluid Power .................................................... 4
RAM 120 Robotics &Automation I ........................... 3

General Technology 16-18

Select at least 16 credits from any of the specializations listed below:

Electronics Technology Credits: 16

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EET 104</td>
<td>Electrical Studies II</td>
<td>3</td>
</tr>
<tr>
<td>EET 161</td>
<td>Fund. of Lights &amp; Lasers</td>
<td>4</td>
</tr>
<tr>
<td>EET 221</td>
<td>Industrial Controls</td>
<td>3</td>
</tr>
<tr>
<td>EET 232</td>
<td>Programmable Logic Controllers</td>
<td>3</td>
</tr>
<tr>
<td>EET 260</td>
<td>System Engineering in Practice</td>
<td>3</td>
</tr>
</tbody>
</table>

Marine Technology (ROV) Credits: 20

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EET 104</td>
<td>Electrical Studies II</td>
<td>3</td>
</tr>
<tr>
<td>ENV 131</td>
<td>Oceanography</td>
<td>4</td>
</tr>
<tr>
<td>WSI 200</td>
<td>GL Research Technologies</td>
<td>3</td>
</tr>
<tr>
<td>WSI 210</td>
<td>Underwater Acoustics and Sonar</td>
<td>3</td>
</tr>
<tr>
<td>WSI 215</td>
<td>Marine GIS &amp; Data Processing</td>
<td>3</td>
</tr>
<tr>
<td>WSI 240</td>
<td>ROV Systems &amp; Operations</td>
<td>4</td>
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</tbody>
</table>

Robotics & Automation Technology Credits: 18

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EET 104</td>
<td>Electrical Studies II</td>
<td>3</td>
</tr>
<tr>
<td>EET 221</td>
<td>Industrial Controls</td>
<td>3</td>
</tr>
<tr>
<td>EET 232</td>
<td>Programmable Logic Controllers</td>
<td>3</td>
</tr>
<tr>
<td>EET 233</td>
<td>PLC Applications I</td>
<td>3</td>
</tr>
<tr>
<td>EET 234</td>
<td>PLC Applications II</td>
<td>3</td>
</tr>
<tr>
<td>EET 260</td>
<td>System Engineering in Practice</td>
<td>3</td>
</tr>
</tbody>
</table>

Unmanned Aerial Systems (UAS) Technology Credits: 18

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVF 141</td>
<td>Introduction to UAS</td>
<td>3</td>
</tr>
<tr>
<td>AVF 241</td>
<td>UAS II</td>
<td>3</td>
</tr>
<tr>
<td>AVG 101</td>
<td>Private Ground School</td>
<td>5</td>
</tr>
<tr>
<td>AVG 210</td>
<td>UAS I</td>
<td>4</td>
</tr>
<tr>
<td>EET 104</td>
<td>Electrical Studies II</td>
<td>3</td>
</tr>
</tbody>
</table>

Unmanned Ground Vehicles (UGV) Technology Credits: 17

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT 130</td>
<td>Engine Performance I</td>
<td>5</td>
</tr>
<tr>
<td>AT 220</td>
<td>Automotive Electrical II</td>
<td>5</td>
</tr>
<tr>
<td>AT 240</td>
<td>Unmanned Ground Vehicles</td>
<td>4</td>
</tr>
<tr>
<td>EET 260</td>
<td>System Engineering in Practice</td>
<td>3</td>
</tr>
</tbody>
</table>

Please consult an NMC Engineering Technology program advisor for scheduling guidelines.

Note: Internship opportunities will be available for additional credits.

Program Requirements Minimum credit hours: 60

Program Information

To apply, use the three-digit NMC Code on your admissions application.

www.nmc.edu
Entrepreneurship Certificate
Certificate of Achievement (Level I)  
NMC Code 051

The Entrepreneurship certificates help students manage and market a business and take an entrepreneurial perspective of business management. They offer an entrepreneur tool set of business knowledge and practices needed for competing in today’s global marketplace. These certificate courses also apply to the course requirements for the Business Administration AAS degree.

Certificate Requirements  
Credits: 16

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 121</td>
<td>Accounting Principles I</td>
<td>4</td>
</tr>
<tr>
<td>BUS 101</td>
<td>Introduction to Business</td>
<td>3</td>
</tr>
<tr>
<td>BUS 105</td>
<td>Business Math</td>
<td>3</td>
</tr>
<tr>
<td>MGT 245</td>
<td>Principles of Entrepreneurship</td>
<td>3</td>
</tr>
<tr>
<td>MKT 201</td>
<td>Principles of Marketing</td>
<td>3</td>
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</tbody>
</table>

Entrepreneurship Certificate
Certificate of Achievement (Level II)  
NMC Code 052

Level I Certificate Requirements  
Credits: 16

Certificate Requirements  
11

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 155</td>
<td>Interpersonal Communications</td>
<td>3</td>
</tr>
<tr>
<td>BUS 261</td>
<td>Business Law I</td>
<td>3</td>
</tr>
<tr>
<td>CIT 216</td>
<td>Computerized Accounting Systems</td>
<td>2</td>
</tr>
<tr>
<td>MKT 241</td>
<td>Principles of Advertising</td>
<td>3</td>
</tr>
</tbody>
</table>

Required Elective  
Any one of the following:  
3-4

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIT 233</td>
<td>Project Management</td>
<td>3</td>
</tr>
<tr>
<td>MGT 241</td>
<td>Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>MGT 246</td>
<td>Entrepreneur Marketing/Finance</td>
<td>4</td>
</tr>
<tr>
<td>MGT 251</td>
<td>Human Resource Management</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits for Level II  
30-31

NMC. Find it here.
# Freshwater Studies

**Associate in Applied Science Degree**

**Economy and Society** .................................................. NMC Code 492

**Global Freshwater Policy and Sustainability** ... NMC Code 491

**Science and Technology** .................................................. NMC Code 493

**General** .................................................. NMC Code 490

The Freshwater Studies program is offered by NMC’s Great Lakes Water Studies Institute. The program is designed to prepare students for both current and emerging career pathways in water related fields. Students have a choice of 4 general streams or emphasis areas: Global Freshwater Policy and Sustainability, Economy and Society, Science and Technology and General. The Freshwater Studies degree program combines unique courses and opportunities for field experiences available through Northwestern Michigan College and our University partners. In addition to the partners in the Great Lakes region, our program has collaborators in selected sites overseas. This freshwater focused program has an interdisciplinary approach designed to offer students the ability to gain unique competencies and credentials of value. The core program of study includes Introduction to Freshwater Studies, Watershed Science, Geographic Information Systems (GIS), Oceanography, Meteorology and Climatology, Water Policy and Sustainability, and an Internship experience either locally or overseas. The degree is intended both for students who plan to enter professional fields as well as those who wish to further their studies and complete a bachelor’s degree with university partners located in Traverse City and offsite.

**General Education Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
<th>17-18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications: ENG 111 and either BUS 231 or ENG 112 or ENG 220</td>
<td>7-8</td>
</tr>
<tr>
<td>Humanities: Group 1 course</td>
<td>3</td>
</tr>
<tr>
<td>Math competency: Placement into MTH 111 or higher, or completion of MTH 23 or MTH 23A and MTH 23B</td>
<td></td>
</tr>
<tr>
<td>Science: Science Group 1 course with a lab</td>
<td>4</td>
</tr>
<tr>
<td>Social Sciences: Group 1 course</td>
<td>3</td>
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</tbody>
</table>

**Core Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
<th>27</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENV 117</td>
<td>Meteorology and Climatology</td>
</tr>
<tr>
<td>ENV 131</td>
<td>Oceanography</td>
</tr>
<tr>
<td>ENV 140</td>
<td>Watershed Science</td>
</tr>
<tr>
<td>GEO 115</td>
<td>Intro to GIS</td>
</tr>
<tr>
<td>PHL 105</td>
<td>Critical Thinking or</td>
</tr>
<tr>
<td>PHL 202</td>
<td>Contemporary Ethical Dilemmas</td>
</tr>
<tr>
<td>WSI 105</td>
<td>Introduction to Freshwater Studies</td>
</tr>
<tr>
<td>WSI 230</td>
<td>Water Policy and Sustainability</td>
</tr>
<tr>
<td>WSI 290</td>
<td>Freshwater Studies Internship</td>
</tr>
</tbody>
</table>

**Areas of Concentration:**

**Economy and Society**

<table>
<thead>
<tr>
<th>Credits</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 110</td>
<td>Essential Biology</td>
</tr>
<tr>
<td>BUS 101</td>
<td>Introduction to Business</td>
</tr>
<tr>
<td>ECO 201</td>
<td>Principles of Macroeconomics</td>
</tr>
<tr>
<td>MGT 241</td>
<td>Principles of Management</td>
</tr>
<tr>
<td>MGT 245</td>
<td>Principles of Entrepreneurship</td>
</tr>
<tr>
<td>MTH 131</td>
<td>Intro to Probability and Statistics</td>
</tr>
</tbody>
</table>

**Global Freshwater Policy and Sustainability**

<table>
<thead>
<tr>
<th>Credits</th>
<th>3-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 110</td>
<td>Essential Biology</td>
</tr>
<tr>
<td>GEO 109</td>
<td>World Regional Geography</td>
</tr>
<tr>
<td>MTH 131</td>
<td>Intro to Probability and Statistics</td>
</tr>
<tr>
<td>SPN 202</td>
<td>Intermediate Spanish II or</td>
</tr>
<tr>
<td>SPN 227A</td>
<td>Spanish for Environmental Mgmt</td>
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</table>

**Science and Technology**

<table>
<thead>
<tr>
<th>Credits</th>
<th>3-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 115</td>
<td>Cell, Plant &amp; Ecosystem Biology or</td>
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<tr>
<td>CHM 150</td>
<td>General Chemistry I or</td>
</tr>
<tr>
<td>BIO 116</td>
<td>Genetic, Evolution, Animal Biology</td>
</tr>
<tr>
<td>CHM 150</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>ECO 202</td>
<td>Principles of Microeconomics</td>
</tr>
<tr>
<td>MTH 121</td>
<td>College Algebra</td>
</tr>
<tr>
<td>MTH 131</td>
<td>Intro to Probability and Statistics</td>
</tr>
<tr>
<td>ASL 101</td>
<td>American Sign Language I and</td>
</tr>
<tr>
<td>ASL 102</td>
<td>American Sign Language II or</td>
</tr>
<tr>
<td>FRN 101</td>
<td>Elementary French I and</td>
</tr>
<tr>
<td>FRN 102</td>
<td>Elementary French II or</td>
</tr>
<tr>
<td>SPN 101</td>
<td>Elementary Spanish I and</td>
</tr>
<tr>
<td>SPN 102</td>
<td>Elementary Spanish II</td>
</tr>
</tbody>
</table>

**Core and Concentration credits can also be applied to General Education requirements.**

Please consult an NMC Freshwater Studies program advisor for scheduling guidelines.

**Program Requirements**

| Minimum credit hours | 60 |

[www.nmc.edu](http://www.nmc.edu)
Law Enforcement

**Associate in Applied Science Degree**  
NMC Code 352

Graduates of this program are eligible to take the state law enforcement officer examination. Students who anticipate transferring to a four-year college or university need to see an NMC advisor during their first semester, as some courses may be acceptable for transfer credit. Students may enroll in the Law Enforcement Preservice Police Academy upon completing first year requirements or with a college degree. Completion of the Police Academy (LWE courses) must occur within two semesters, beginning fall semester and completed the following spring semester. A minimum grade of 2.0 must be achieved in each LWE course, satisfying prerequisites for licensing and qualifying the student to take the state examination to be hired by a law enforcement agency, which activates the license. The Police Academy is approved and regulated by the Michigan Commission on Law Enforcement Standards (MCOLES).

It is mandatory that students meet with the Law Enforcement Coordinator prior to beginning LWE courses to register with MCOLES. Students must pass MCOLES reading/writing and physical agility tests prior to starting the LWE courses. Visit www.michigan.gov/mcoles for online registration or call (231) 995-1283 with questions.

**General Education Requirements**  
Credits: 18

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 111 and ENG 112</td>
<td>Communications</td>
<td>8</td>
</tr>
<tr>
<td>PHL 201 or PHL 202</td>
<td>Humanities</td>
<td>3</td>
</tr>
<tr>
<td>MTH 111 or MTH 23</td>
<td>Math competency</td>
<td>3</td>
</tr>
<tr>
<td>MTH 23A or MTH 23B</td>
<td>Science</td>
<td>4</td>
</tr>
<tr>
<td>PLS 101 or PLS 132</td>
<td>Social Sciences</td>
<td>3</td>
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</table>

**Core Requirements**  
13

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>CJ 101</td>
<td>Introduction to Criminal Justice</td>
<td>4</td>
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<tr>
<td>PSY 101</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSY 250</td>
<td>Abnormal Psychology or</td>
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<tr>
<td>SOC 231</td>
<td>Deviance and Criminal Behavior</td>
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</tr>
<tr>
<td>SOC 101</td>
<td>Introduction to Sociology</td>
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</table>

**Occupational Specialty Requirements**  
39

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>HAH 200</td>
<td>Emergency Assessment and Intervention</td>
<td>3</td>
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<tr>
<td>LWE 102</td>
<td>Police Operations</td>
<td>4</td>
</tr>
<tr>
<td>LWE 210</td>
<td>Cultural Awareness/Diversity</td>
<td>2</td>
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<td>LWE 212</td>
<td>Criminal Investigation</td>
<td>3</td>
</tr>
<tr>
<td>LWE 214</td>
<td>Firearms</td>
<td>4</td>
</tr>
<tr>
<td>LWE 215</td>
<td>Defensive Driving</td>
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<tr>
<td>LWE 216</td>
<td>Traffic Enforcement and Investigation</td>
<td>3</td>
</tr>
<tr>
<td>LWE 218</td>
<td>Physical Training/Wellness</td>
<td>4</td>
</tr>
<tr>
<td>LWE 225</td>
<td>Defensive Tactics</td>
<td>3</td>
</tr>
<tr>
<td>LWE 226</td>
<td>Michigan Criminal Law</td>
<td>3</td>
</tr>
<tr>
<td>LWE 227</td>
<td>Criminal Procedures</td>
<td>3</td>
</tr>
<tr>
<td>LWE 228</td>
<td>Speed Measurement/PBT</td>
<td>3</td>
</tr>
</tbody>
</table>

**Recommended Course:**

LWE 195* | Police Practicum | 4

*Recommended for students with no police field experience.

**Program Requirements**  
70

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Manufacturing Technology

**Associate in Applied Science Degree**  
NMC Code 584

The Manufacturing Technology program is designed to provide a multi-disciplined technical background in fields for which NMC does not offer a specific program. For instance, students interested in pursuing careers in Advanced Manufacturing or Welding may enroll in the Manufacturing Technology program and design a model schedule that emphasizes their major area of interest. The program has the flexibility to match the student’s interest with the skills necessary for job entry.

Students, with assistance from an advisor, will select a major area of technical emphasis. These technical courses plus supporting courses from other disciplines comprise the Manufacturing Technology degree requirements.

Each student’s proposed Manufacturing Technology program must be approved by a committee consisting of the appropriate Department Head, the Academic Chair, and the Registrar.

**General Education Requirements**  
Credits: 17-18

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 111 and either BUS 231 or ENG 112</td>
<td>Communications</td>
<td>7-8</td>
</tr>
<tr>
<td>Humanities</td>
<td>Any Group 1 course</td>
<td>3</td>
</tr>
<tr>
<td>Science</td>
<td>Any Group 1 course with lab</td>
<td>4</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>Any Group 1 course</td>
<td>3</td>
</tr>
<tr>
<td>MTH 111 or higher, or completion of MTH 23 or MTH 23A and MTH 23B</td>
<td>Math competency</td>
<td>3</td>
</tr>
</tbody>
</table>
| *Students intending to transfer to another college or university should take ENG 112.*

**Occupational Specialty Requirements**  
39

**Electives**  
4-9

Choose any courses from Group 1 and/or Group 2.

**Program Requirements**  
60-65
Marine Technology

Bachelor of Science in Maritime Technology

NMC Code 870

The Marine Technology major at NMC prepares students to meet the needs of the global marine industry. Graduates will be in high demand for global employment opportunities in extremely diverse and fast-growing industries. This four-year bachelor’s program builds on NMC’s Marine Technology concentration of the Engineering Technology associate degree. Technical training will occur at numerous campus labs, NMC’s Great Lakes campus harbor and aboard research vessels operating throughout the Great Lakes. Program emphasis is focused on project management, technical competencies and hands-on learning with students having direct access to remotely operated vehicles, multiple SONAR platforms, marine instrumentation and marine data processing software. Instruction will be provided by highly trained instructors with experience in the industry.

Students must also complete First Aid/CPR certification and HAZWOPER certification.

General Education Requirements

Credits: 42

- Communications: ENG 111 and ENG 220 ......................7
- Humanities: PHL 105 or PHL 202 ..............................6
- Math competency: MTH 121, MTH 122, MTH 131 and
  MTH 141 ..............................................................15
- Science: PHY 121 and PHY 122 .................................8
- Social Science: ECO 202 and GEO 115 .......................6

Marine Technology Requirements

Credits: 78

- CIT 110 Programming Logic & Design .......................3
- DD 170 CADD/Computer Modeling ..........................4
- EET 102 Intro to Engineering Technology ..................2
- EET 103 Electrical Studies I ....................................3
- EET 104 Electrical Studies II ...................................3
- EET 304 Marine Electronics ................................. 3
- ENV 107 Meteorology & Climatology ........................4
- ENV 131 Oceanography .........................................4
- MFG 103 Manufacturing Processes ..........................3
- MFG 104 Fluid Power ...........................................4
- MFG 304 Marine Hydraulics ....................................4
- RAM 120 Robotics & Automation I ...........................3
- WSI 200 GL Research Technologies ........................3
- WSI 210 Underwater Acoustics and Sonar .................3
- WSI 215 Marine GIS & Data Processing ....................3
- WSI 240 ROV Systems & Operations .......................3
- WSI 300 Remote Sensing and Sensors ........................3
- WSI 310 Sonar Systems & Operations ........................4
- WSI 315 Advanced Marine Survey & Data .................3
- WSI 390 Internship ..............................................3
- WSI 400 Marine Technology Capstone ....................4
- WSI 405 Marine Industry ........................................3
- WSI 433 Marine Project Management ......................3
- WSI 440 AUV Systems & Operations ........................3

Program Requirements

Minimum credit hours: 120
Maritime
Great Lakes Maritime Academy
Bachelor of Science in Maritime Technology

NMC Code 850 / 851

The Great Lakes Maritime Academy is more than just a college experience. As Michigan’s State Maritime Academy, our college educates and trains the finest Deck and Engineering Officers available to the commercial shipping industry.

As you learn more about us, you will discover a professional environment based on pride and tradition. The Academy prepares future merchant marine officers/business professionals for the challenge of operating ships of unlimited tonnage. Our training ship, State of Michigan, is utilized daily as a floating classroom and hands on learning environment. We set sail with our ship at various times throughout the academic year to reinforce the skills taught shoreside. As cadets progress through the Academy, they learn our industry first hand by completing essential sea time aboard the training ship and commercial vessels of the Great Lakes and oceans.

Cadets earn their maritime credentials and a Bachelor’s degree. We offer a condensed core curriculum for those who enter with a Bachelor’s degree. Cadets are prepared to write the U.S. Coast Guard examination for licensing as Third Mate Great Lakes and Oceans Unlimited Tonnage and First Class Great Lakes Pilot (Deck Officer), or Third Assistant Engineer, Steam and Motor Vessels of any Horsepower (Engineering Officer). Graduates are fully compliant with Standards of Training, Certification and Watchkeeping (STCW).

Great Lakes Maritime Academy is proud of the quality education and training we have provided since 1969. Curriculum range from seamanship, navigation and piloting to steam and diesel engineering together with up to 300 days of sea time. Our alumni sail with the fleets of the Great Lakes and oceans with many having reached the pinnacle of their professions as a Captain or Chief Engineer. With exceptional employment and salaries upon graduation, the time is now to consider a career as a professional mariner. The Admissions Office is open weekdays from 8:00 am to 5:00 pm. Please visit www.nmc.edu/maritime for additional information.

This program is approved by the U.S. Maritime Administration, the U.S. Coast Guard, and the Michigan Department of Education. A new class begins each year in mid August (Pre-Fall semester).

ADMISSION REQUIREMENTS
Admission to the Great Lakes Maritime Academy requires candidates meet the following:

1. Minimum age 17, with high school diploma or GED.
2. United States Citizen
3. Academic placement at Freshman English and Intermediate Algebra level determined by minimum composite ACT score of 20, SAT score of 1440, transferrable college credits or COMPASS placement testing.
4. No misdemeanors, felonies or legal expungements.

Acceptance to the Great Lakes Maritime Academy is competitive, with the incoming class of 60 cadets beginning in the fall of each year. Admissions decisions are made without regard to age, sex, marital status, national origin, or ethical/racial background. Applicants may apply at www.nmc.edu/maritime to submit online application. An application checklist is provided. If you have questions, please call the Maritime Admissions Office at (231) 995-1213 or (231) 995-1209.

GENERAL PROGRAM REQUIREMENTS
In addition to NMC rules and regulations, Maritime cadets must comply with the rules and regulations specified under the “Maritime Cadet Rules and Regulations.”

DEPARTMENT OF NAVAL SCIENCE
The Department of Naval Science is staffed by an active duty Naval officer. The Department offers training designed to acquaint the cadet with the mutual dependence of the Navy and the Merchant Marine in accomplishing their common objectives through the MNS 100 course. Additionally, Strategic Sealift Officer Program (SSOP) Midshipmen will receive Navy professional development training through the MNS 200 and MNS 250 courses. Upon completion of the SSOP, graduates will be commissioned as an Ensign in the United States Navy Reserve.

GRADUATION REQUIREMENTS
In addition to NMC graduation requirements, Maritime Academy cadets must:

1. Successfully complete all components of the program.
2. Pass the U.S. Coast Guard license exam.
3. Achieve a 2.0 (76%) grade or higher in all courses.

CURRICULUM
The Great Lakes Maritime Academy and NMC offer two bachelor degree programs of study:

• Bachelor of Science - Maritime Technology: Deck Officer
• Bachelor of Science - Maritime Technology: Engineering Officer

Each program provides the cadet with a background in mathematics, physical science, humanities, and social studies in addition to the maritime curriculum.

Federal regulations require that each cadet obtain up to 300 sailing days of practical training as a cadet observer aboard ship. Sea time is arranged by the Academy and spread over the program. In addition to shipboard duties, the cadets are required to complete written assignments, sea projects, for evaluation and grading. Great Lakes Maritime reserves the right to revise the program in accord with industry needs and government agency requirements.

The following program requirements are for a high school graduate or a person without transfer credits from another institution. A condensed maritime curriculum for students with a bachelor’s degree is available.
# Maritime - Deck Officer
## Great Lakes Maritime Academy
### Bachelor of Science in Maritime Technology

**NMC Code 850**

**General Education Requirements**  
**Credits: 35**
- Communications: ENG 111 and ENG 112 ............................. 8
- Humanities: PHL 202 and one additional .............................. 6
- Math competency: Placement into MTH 141 or higher, or completion of MTH 121 and MTH 122 .......................... 7
- Science: ENV 117 and PHY 105 ........................................... 8
- Social Science: ECO 201 and ECO 202 ................................. 6

**Maritime Requirements**  
**82**
- MDK 100 Survival at Sea ..................................................... 1
- MDK 104 Rigging and Ship Maintenance Lab ......................... 1
- MDK 106 Watchstanding I ................................................... 1
- MDK 112 Rules of the Nautical Road ............................... 2
- MDK 121 Navigation I ............................................................ 3
- MDK 122 Navigation I Lab .................................................... 1
- MDK 149 Damage Control & Safety ................................. 2
- MDK 200 Ship Business & Labor Relations ......................... 3
- MDK 206 Watchstanding II ................................................. 1
- MDK 210 Sea Project Deck .................................................. 6
- MDK 221 Lakes Piloting ....................................................... 2
- MDK 222 River Piloting ...................................................... 3
- MDK 242 Ship Stability ........................................................... 3
- MDK 311 Sea Project Deck ................................................... 6
- MDK 312 Sea Project Deck ................................................... 6
- MDK 324 Navigation III ........................................................... 3
- MDK 330 STCW Elementary First Aid .................................... 2
- MDK 331 Electronic Navigation .............................................. 3
- MDK 332 Electronic Navigation Lab ....................................... 1
- MDK 333 Automatic Radar Plotting Aids .............................. 1
- MDK 341 Ship Construction ..................................................... 2
- MDK 345 Dry Cargo Stowage ................................................ 3
- MDK 404 Marine Supervisory Lab ........................................ 1
- MDK 411 Marine Communications ........................................ 2
- MDK 431 ECDIS ................................................................. 3
- MDK 444 Cargo Systems ....................................................... 2
- MDK 445 Liquid Cargo Stowage ............................................. 2
- MDK 446 Bridge Team Management ...................................... 3
- MDK 448 Pilot/Mate License Prep ........................................... 4
- MDG 454 GMDSS ............................................................... 3
- MNG 100 Intro to Marine Engineering .................................. 1
- MNG 105 Shipboard Systems ............................................... 3
- MNS 100 Naval Science ....................................................... 2

**Occupational Specialty Requirements**  
**3**
- MGT 241 Principles of Management .................................... 3

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# Maritime - Engineering Officer
## Great Lakes Maritime Academy
### Bachelor of Science in Maritime Technology

**NMC Code 851**

**General Education Requirements**  
**Credits: 30-31**
- Communications: ENG 111 and either ENG 112 or ENG 220 ..................................................... 7-8
- Humanities: PHL 202 .............................................................. 3
- Math competency: Placement into MTH 141 or higher, or completion of MTH 121 and MTH 122 ...................... 7
- Science: CHM 101 ............................................................... 4
- Social Science: PLS 101 ........................................................ 3
- Any Group I course(s) from approved Maritime program electives ......................................................... 6

**Occupational Specialty Requirements**  
**89-90**
- MDK 100 Survival at Sea ..................................................... 1
- MDK 149 Damage Control & Safety ....................................... 2
- MDK 250 Stability for the Engineer ....................................... 1
- MDK 330 STCW Elementary First Aid .................................... 2
- MDK 341 Ship Construction ................................................... 2
- MNG 100 Intro to Marine Engineering .................................. 1
- MNG 104 Engine Systems Graphics ....................................... 3
- MNG 105 Shipboard Systems ............................................... 3
- MNG 110 Engineering Mechanics ......................................... 3
- MNG 234 Electronic Fundamentals ....................................... 4
- MNG 250 Unloading Systems ................................................ 3
- MNG 260 Maritime Machining .............................................. 2
- MNG 271 Maritime Welding ................................................ 2
- MNG 275 Refrigeration ........................................................ 3
- MNG 314 Diesel Engineering ............................................... 7
- MNG 317 Engineering Sea Project I ..................................... 3
- MNG 318 Engineering Sea Project II .................................... 6
- MNG 319 Engineering Sea Project III ................................... 6
- MNG 321 Marine Boilers ..................................................... 3.5
- MNG 322 Marine Turbines ................................................... 2.5
- MNG 323 Steam Lab ............................................................... 1
- MNG 335 Electric Machines and Controls ............................ 4
- MNG 336 Electric Machines & Controls Lab ........................... 2
- MNG 455 Watchstanding ....................................................... 2
- MNG 466 Engine Room Business .......................................... 2
- MNG 496 License Preparation Engine .................................... 2
- MNS 100 Naval Science ....................................................... 2
- GLMA Program Electives .................................................... 14-15

**Program Requirements**  
**Minimum credit hours: 120**

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*To apply, use the three-digit NMC Code on your admissions application.*

*www.nmc.edu*
Maritime - Power Plant Facilities Operator
Great Lakes Maritime Academy

Associate in Applied Science Degree  NMC Code 554

The Power Plant Facilities Operator Program is designed to prepare individuals for the maintenance and power production industries such as power plants, hospitals, industrial plants, and manufacturing plants. Operators in such industries read, interpret and adjust meters and gauges to make sure plant equipment and processes are working properly. Some operate chemical-feeding devices, take samples of the water or liquid waste, perform chemical and biological laboratory analysis and adjust the amount of chemicals such as chlorine in the water. Some use a variety of instruments to sample and measure water quality and common hand and power tools to make repairs. Operators also make repairs to valves, pumps and other equipment. As facilities become more sophisticated and industry demands more from those individuals who maintain and operate these physical plants, there is a need for intense technical training for these positions. Students at the Great Lakes Maritime Academy obtain these goals through classes in mathematics, science and occupational courses. Cadets also have hands-on experience through labs and internships for practical training.

**General Education Requirements**  
Credits: 24-25

- Communications: ENG 111 and either ENG 112 or ENG 220 ......................................................... 7-8
- Humanities: Any Group 1 Course ................................................................. 3
- Math competency: Placement into MTH 141 or higher, or completion of MTH 121 and MTH 122 ......................... 7
- Science: CHM 101 or PHY 105 ......................................................... 4
- Social Science: Any Group 1 Course ......................................................... 3

**Occupational Specialty Requirements**  
54

- MGT 241 Principles of Management ......................................................... 3
- MNG 100 Intro to Marine Engineering ......................................................... 1
- MNG 104 Engine Systems Graphics ......................................................... 3
- MNG 105 Shipboard Information Systems ......................................................... 3
- MNG 110 Engineering Mechanics ......................................................... 3
- MNG 234 Electronic Fundamentals ......................................................... 4
- MNG 250 Unloading Systems ......................................................... 3
- MNG 270 Issues in Power Production ......................................................... 3
- MNG 275 Refrigeration ......................................................... 3
- MNG 290 Power Systems Internship ......................................................... 5
- MNG 314 Diesel Engineering ......................................................... 7
- MNG 321 Marine Boilers ......................................................... 3.5
- MNG 322 Marine Turbines ......................................................... 2.5
- MNG 323 Marine Steam Lab ......................................................... 1
- MNG 335 Electric Machines and Controls ......................................................... 4
- MNG 336 Electric Machines and Controls Lab ......................................................... 2
- Elective Credits ......................................................... 3

**Recommended Elective**  
3

- MGT 251 Human Resource Management ......................................................... 3

**Program Requirements**  
76-79
Nursing - Associate Degree Program Requirements

NMC Code 302

Nursing Students admitted to the nursing program prior to fall 2009 must follow the catalog requirements in effect the year they began unless they are returning as re-admitted students.

The NMC Associate Degree in Nursing (ADN) offers students the advantage of college-level academic and professional instruction in the classroom and clinical areas, and the preparation needed for employment after graduation. The associate degree program is a two-year course of study that begins each fall and spring semesters. All nursing courses in the ADN program must be completed within five years. Student clinical experiences may include assignments at Munson Medical Center and a variety of other agencies.

The program is approved by the Michigan Board of Nursing. Graduates are eligible to apply for the National Council Licensure Examination (NCLEX-RN) for licensing as a registered nurse.

ADMISSION REQUIREMENTS

Enrollment in any Nursing (HNR) course requires admission to the nursing program OR approval of the nursing department director. HNR 100 and HNR 108 may be taken ahead of program admission if course prerequisites are met. Consideration for admission is on a “competitive” basis and requires satisfactory completion of program prerequisites. Space in the nursing program is limited. Completion of prerequisites does not guarantee admission to the nursing program. Submit completed applications to the Admissions Office by February 1 for Fall semester (August) and July 1 for Spring semester (January).

The following are required for application:

1. A 2.5 college GPA.
2. A 2.0 grade or above in each of the following prerequisite courses and/or demonstrated competency or equivalent college course transfer:
   - English Composition (ENG 111)
   - Introduction to Psychology (PSY 101)
   - Introductory Chemistry (CHM 101) or equivalent college chemistry course with a 2.0 GPA or above within ten years of program entry. Students with a year of high school chemistry (with a combined GPA of 2.5 or above) or college chemistry older than 10 years may waive the CHM 101 requirement by passing the Chemistry competency examination.
3. Human Anatomy and Physiology I (BIO 227), with a 2.5 GPA, within five years of program entry or successfully complete a competency exam.
4. COMPASS Test Scores:
   - Math-66 or above in Algebra
   - COMPASS students must place into MTH 121-College Algebra. If not, students must take MTH 111-Intermediate Algebra (or equivalent course work) within five years of program entry.
5. ACT Test Scores:
   - ACT of 24 in math within five years of program entry.
   - ACT of 19 in reading and 18 in writing, (or equivalent course work) within five years of program entry.

Note: Any math and/or science class may only be repeated once. This includes fails, drops, audits or transferred classes.

Recommended courses to take prior to Nursing Program Admission

- BIO 228 Human Anatomy and Physiology II with a 2.5 GPA, within five years of program entry.
- BIO 240 Normal and Clinical Nutrition
- PHL 202 Contemporary Ethical Dilemmas
- ENG 112 English Composition
- HPD 110 Basic Life Support for Health Care Workers (CPR) Equivalent classes are: American Red Cross Professional Rescuer or AHA Health Care Provider. Current CPR certification must be documented by the start of the first clinical day, and maintained throughout the program.

GENERAL INFORMATION

- A physical examination and completion of the Certificate of Health documenting good mental and physical health is required prior to clinical course work.
- Criminal Background Checks are now required on all students entering the Associate Degree of Nursing and the Practical Nursing programs at Northwestern Michigan College. This is due to the change in legislation that requires Criminal Background Checks be completed for certain health care institutions. The background check will be required by Northwestern Michigan College upon admission to the program and prior to the beginning of the first course. The costs associated with this background check will be the sole responsibility of the nursing student.
- The Board of Nursing may deny a license for a previous felony conviction, previous treatment for drug or alcohol abuse or after finding the existence of one or more grounds for board action listed in 333.16221 of the Public Health Code, Act 368 of 1978.
- The clinical facilities have the right to accept or reject a student. This action could result in a student being delayed or unable to complete the nursing program. This decision may be made just prior to the clinical rotation.
- Nursing program tuition is charged by the contact hour.

General Education Requirements Credits: 23-25

Communications: ENG 111 and ENG 112 ..........................6-8
Humanities: PHL 202.........................................................3
Math competency: Placement into MTH 121 or higher, or completion of MTH 111
Science: BIO 227, BIO 228**, BIO 240 ............................11
Social Sciences: PSY 101 .................................................3
Nursing Specialty Requirements  Credits: 45

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAH 100C</td>
<td>Informatics Essentials</td>
<td>1</td>
</tr>
<tr>
<td>HNR 100</td>
<td>Introduction to Nursing</td>
<td>1</td>
</tr>
<tr>
<td>HNR 101</td>
<td>Fundamentals of Nursing-Lecture</td>
<td>4</td>
</tr>
<tr>
<td>HNR 102</td>
<td>Fundamentals of Nursing-Clinical</td>
<td>4</td>
</tr>
<tr>
<td>HNR 108</td>
<td>Pharmacology</td>
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<tr>
<td>HNR 125</td>
<td>Nursing Across the Lifespan-Lecture</td>
<td>5</td>
</tr>
<tr>
<td>HNR 126</td>
<td>Nursing Across the Lifespan-Clinical</td>
<td>5</td>
</tr>
<tr>
<td>HNR 241</td>
<td>Adv. Maternal Child Nursing-Lecture</td>
<td>3</td>
</tr>
<tr>
<td>HNR 242</td>
<td>Adv. Maternal Child Nursing-Clinical</td>
<td>2</td>
</tr>
<tr>
<td>HNR 247</td>
<td>Nrsg Mgmt of Complex Patients I-Lecture</td>
<td>3</td>
</tr>
<tr>
<td>HNR 248</td>
<td>Nrsg Mgmt of Complex Patients I-Clinical</td>
<td>4</td>
</tr>
<tr>
<td>HNR 251</td>
<td>Mental Health Nursing-Lecture</td>
<td>2</td>
</tr>
<tr>
<td>HNR 252</td>
<td>Mental Health Nursing-Clinical</td>
<td>1</td>
</tr>
<tr>
<td>HNR 261</td>
<td>Nrsg Mgmt of Complex Patients II-Lecture</td>
<td>3</td>
</tr>
<tr>
<td>HNR 262</td>
<td>Nrsg Mgmt of Complex Patients II-Clinical</td>
<td>4</td>
</tr>
<tr>
<td>HPD 110</td>
<td>Basic Life Support for Health Care Providers*</td>
<td></td>
</tr>
</tbody>
</table>

* Equivalent classes are: American Red Cross Professional Rescuer or AHA Health Care Provider
**These credits do not count toward degree requirements.

Note: A 2.0 grade or higher is required in all Nursing (HNR) courses. A minimum of 68 credits are required to receive the Associate Degree in Nursing. Any HNR course failure counts as a program fail and requires readmission. A second course failure is a program dismissal.

Program Requirements  68-70

Online Nursing Option

NMC admits students to an online version of its tradition-
al nursing curriculum each fall. This option is intended for
full-time ADN students. It provides all of the nursing theory
of academic classes available in an online format. It will still
require attendance in person for the lab and clinical courses. The
labs and clinical courses are generally scheduled in the Traverse
City area and will require 2-3 days per week of attendance.

Once you begin the online option, the college will ensure that
the online courses will be available until you complete the
program as long as the full-time model schedule is followed.

If you need to change from the full-time plan or your studies
become out of sequence for any reason, you will need to move
into the traditional program.

Nursing - ADN Completion Program

Completion Program for Licensed Practical Nurses

The ADN-Completion Program for Licensed Practical Nurses is
designed to expand upon the previous education of the
LPN. Upon completion of all non-nursing required course
work, the LPN who has current clinical work experience in
acute or extended care or who has graduated within the past
three years can complete the nursing course work in two
semesters. The technology and patient acuity in the agencies
utilized for clinical course work have changed greatly in recent
years. Recent experience in these settings is important to the
success of students pursuing this course work.

Student clinical experiences may include assignments at
Munson Medical Center and a variety of other agencies.
The program is approved by the Michigan Board of Nursing.
Graduates are eligible to apply for National Council Licensure
Examination (NCLEX-RN) for licensing as a registered nurse.
NMC utilizes hospital and non-hospital based clinical sites to
meet the requirements for completion of the program.

NMC’s program is approved by the Michigan Board of
Nursing. Graduates are eligible to apply for the National Council Licensure Examination (NCLEX-RN) for licensing
as a registered nurse.

ADMISSION REQUIREMENTS

Enrollment in any Nursing (HNR) course requires admission
to the nursing program and/or approval of the nursing de-
partment director. Consideration for admission is on a rolling
basis and requires satisfactory completion of program prereq-
usites. Space in the program is limited. Completion of prereq-
usites does not guarantee admission to the nursing program.
Should qualified applicants exceed space available, competitive
admission criteria may apply. Completed applications must
be submitted to the Admissions Office by February 1 for Fall
semester (August) and July 1 for Spring semester (January).

The following are required for application:

2. Graduation from an accredited Practical Nursing Program
with evidence of an official transcript with an overall GPA
of 2.0 or above. Applicants must have work experience in
the field of nursing or clinical coursework within the last
three (3) years. Applicants who do not meet the work
experience criteria will be required to complete the first
year nationally normed nursing exam with a minimum
competency as identified by the testing service before
progressing in the program. If this minimum competency
is not achieved, HNR 126 will be required. Additional
assessments may be used to determine course placement.
3. CHM 101 or equivalent college chemistry course at 2.0
GPA or higher within ten years of program entry. Students
with a year of high school chemistry (with a combined
grade of 2.5 or above) or college chemistry older than ten
years may waive the CHM 101 requirement by passing the
Chemistry competency examination.

(continued)
4. COMPASS Test scores: Math-66 or above in Algebra (or equivalent course work) within five years of program entry. Students must place into MTH 121-College Algebra. If not, students must take MTH 111-Intermediate Algebra.

5. Completion of all General Education Requirements, as identified on the following pages, with an overall GPA of 2.0 or above. In addition to the overall GPA requirement, a minimum of 2.5 or higher in BIO 227 and BIO 228 (BIO 227 and BIO 228 within five years of program entry or successful completion of a competency exam), a minimum grade of 2.0 is required in ENG 111 and PSY 101.

Note: Any math and/or science class may only be repeated once. This includes fails, drops, or transferred classes.

**GENERAL INFORMATION**

- A physical examination and completion of the Certificate of Health documenting good mental and physical health is required prior to clinical course work.

- Criminal Background Checks are now required on all students entering the Associate Degree of Nursing and the Practical Nursing programs at Northwestern Michigan College. This is due to the change in legislation that requires Criminal Background Checks be completed for certain health care institutions. The background check will be required by Northwestern Michigan College upon admission to the program and prior to the beginning of the first course. The costs associated with this background check will be the sole responsibility of the nursing student.

- The Board of Nursing may deny a license for a previous felony conviction, previous treatment for drug or alcohol abuse or after finding the existence of one or more grounds for board action listed in 333.16221 of the Public Health Code, Act 368 of 1978.

- The clinical facilities have the right to accept or reject a student. This action could result in a student being delayed or unable to complete the nursing program. This decision may be made just prior to the clinical rotation.

- Nursing program tuition is charged by the contact hour.

**General Education Requirements**

<table>
<thead>
<tr>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Credits: 23-25</strong></td>
</tr>
</tbody>
</table>

- Communications: ENG 111 (2.0 or higher) and ENG 111 ................................. 6-8
- Humanities: PHL 202 ......................................................... 3
- Math competency: Placement into MTH 121 or higher, or completion of MTH 111
- Science: BIO 227, 228**, 240 ............................................. 11
- Social Sciences: PSY 101 .................................................... 3

* These credits do not count toward degree requirements.

** For an equivalent transfer of BIO 227 and BIO 228 from another institution, students must have completed a full year of Anatomy and Physiology, and one semester of Microbiology with a 2.5 grade or higher within five years of program entry.

**Nursing Specialty Requirements**

<table>
<thead>
<tr>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Credits: 45</strong></td>
</tr>
</tbody>
</table>

- Level One Nursing Coursework ............................................. 23

**Note:** Credit for the practical nursing level course work (HNR 100-145) must be established prior to admission to the program. At least 23 nursing credits must be established through NMC course completion or transfer equivalencies to meet the program requirements. Additional course work may be required and will be arranged by the Nursing Director if needed.

- HAH 100C Informatics Essentials ......................... (1)
- HNR 242 Adv. Maternal Child Nursing-Clinical ...... 2
- HNR 247 Nursing Management of Complex Patients I-Lecture .................................. 3
- HNR 248 Nursing Management of Complex Patients I-Clinical .................................. 4
- HNR 251 Mental Health Nursing-Lecture .................. 2
- HNR 252 Mental Health Nursing-Clinical ................. 1
- HNR 261 Nursing Management of Complex Patients II-Lecture ......... 3
- HNR 262 Nursing Management of Complex Patients II-Clinical ......................... 4
- HPD 110 Basic Life Support for Health Care Providers* ................................ (0.2)

* Equivalent classes are: American Red Cross Professional Rescuer or AHA Health Care Provider

**Note:** A 2.0 grade or higher is required in all Nursing (HNR) courses. A minimum of 70-72 credits are required to receive the Associate Degree in Nursing.

**Program Requirements**

<table>
<thead>
<tr>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>68-70</strong></td>
</tr>
</tbody>
</table>

To apply, use the three-digit NMC Code on your admissions application.
Nursing - Practical
Certificate of Achievement (Level II)  NMC Code 010

Northwestern Michigan College's Practical Nursing Program is a two-semester certificate program after prerequisites are met. It is designed to give the student basic health care provider skills which will enable them to become eligible to take the National Council Licensure Examination (NCLEX-PN). After successfully completing the NCLEX-PN exam, students are able to enter the work force in various healthcare settings.

License Practical Nurses often work in offices, long-term care and home health care facilities. All nursing courses must be completed within five years.

The program is approved by the Michigan Board of Nursing.

Graduates of this program are eligible to apply for the National Council Licensure Examination (NCLEX-PN) for licensing as a Practical Nurse.

ADMISSION REQUIREMENTS

Enrollment in any Nursing (HNR) course requires admission to the nursing program OR approval of the Nursing Program Director. HNR 100 and HNR 108 may be taken ahead of program admission if course prerequisites are met and space available. Program admission is on a competitive basis and requires satisfactory completion of all program prerequisites. Space in the program is limited. Completion of prerequisites does not guarantee admission to the Nursing Program.

Should qualified applicants exceed space available, competitive admission criteria may apply. Completed applications must be submitted to the College Admission Office by February 1 for Fall semester (August) and July 1 for Spring semester (January).

The following are required for application:
1. *2.0 college GPA.
2. *COMPASS test scores: Reading-82 or above, Writing-70 or above, Math-66 on Algebra (or equivalent coursework) within five years of program entry. Students must place into MTH 121-College Algebra. If not, students must take MTH 111-Intermediate Algebra, OR have an ACT score of 19 for reading and writing, and math ACT of 24. (Reading and writing COMPASS scores are required for students who do not transfer equivalent courses)
3. Courses required for admission consideration.
   • *CHM 101 competency or equivalent college chemistry course at a 2.0 or higher within ten years of program entry. Students with a year of high school chemistry (with a combined grade of 2.5 or above) or with college chemistry older than 10 years, may waive the CHM 101 requirement by passing the Chemistry competency exam.
   • *BIO 227-Anatomy and Physiology I - 2.5 GPA required. Must be taken within five years of program entry. If not, students may retake BIO 227 and BIO 228 or successfully complete a competency exam. BIO 227 has specific prerequisites that may require additional coursework.
   • For an equivalent transfer of BIO 227 and BIO 228 from another institution, students must have completed a full year of Anatomy and Physiology, and one semester of Microbiology with a 2.5 grade or higher within five years of program entry.
4. Courses recommended to be completed prior to starting the PN program.
   • BIO 228-Anatomy and Physiology II with a 2.5 GPA required.
   • BIO 240-Normal and Clinical Nutrition
   • HPD 110-BLS for Health Care Providers

* Eligible for wait list once these prerequisites are completed.

Note: Any math and/or science class may only be repeated once. This includes fails, drops, or transferred classes.

GENERAL INFORMATION

• A physical examination and completion of the Certificate of Health documenting good mental and physical health is required prior to clinical course work.
• Criminal Background Checks are now required on all students entering the Associate Degree of Nursing and the Practical Nursing programs at Northwestern Michigan College. This is due to the change in legislation that requires Criminal Background Checks be completed for certain health care institutions. The background check will be required by Northwestern Michigan College upon admission to the program and prior to the beginning of the first course. The costs associated with this background check will be the sole responsibility of the nursing student.
• The Board of Nursing may deny a license for a previous felony conviction, previous treatment for drug or alcohol abuse or after finding the existence of one or more grounds for board action listed in 333.16221 of the Public Health Code, Act 368 of 1978.
• The clinical facilities have the right to accept or reject a student. This action could result in a student being delayed or unable to complete the nursing program. This decision may be made just prior to the clinical rotation.
• Nursing program tuition is charged by the contact hour.

Certificate Requirements Credits: 35

BIO 227 Human Anatomy & Physiology I with Lab ...
BIO 228 Human Anatomy & Physiology II with Lab...
BIO 240 Normal and Clinical Nutrition ..............
HNR 100 Introduction to Nursing .....................
HNR 101 Fundamentals of Nursing-Lecture ...........
HNR 102 Fundamentals of Nursing-Clinical ...........
HNR 108 Pharmacology ..............................
HNR 125 Nursing Across the Lifespan-Lecture ..... 5
HNR 126 Nursing Across the Lifespan-Clinical ..... 5
HNR 145 Practical Nursing Role & Issues .......... 1
HAH 100C Informatics Essentials ....................
HPD 110 Basic Life Support for Health Care Providers *

* Equivalent classes are: American Red Cross Professional Rescuer or AHA Health Care Provider

Note: A 2.0 grade or higher is required in all Nursing (HNR) courses.
Plant Science

Associate in Applied Science Degree

Agricultural Operations ........................................ NMC Code 583
Fruit and Vegetable Crop Management .......... NMC Code 581
Landscape Management .................................. NMC Code 582
Viticulture .................................................... NMC Code 580

NMC and MSU offer a joint program that can lead to an Associate in Applied Science Degree in the areas of Agricultural Operations, Fruit and Vegetable Crop Management, Landscape Management, or Viticulture through NMC. Students dual enroll with NMC and MSU at the University Center. After completing a minimum of 55 hours in the program, a certificate is awarded from the MSU, Institute of Agricultural Technology. Upon meeting the program requirements for the AAS, students may transfer to the MSU East Lansing Campus as a junior to complete a Bachelor of Science degree. The AAS Degree is awarded upon completion of the MSU certificate and the following additional NMC courses. See your MSU advisor prior to enrolling each semester.

College of Agriculture and Natural Resources
2200 Dendrinos Drive, Suite 203, Traverse City, MI 49684
Phone: (231) 995-1719
Email: matching@msu.edu

**General Education Requirements** 
Credits: 17-19
Communications: ENG 111 or BUS 231 or ENG 112 or ENG 220 ................................. 7-8
Humanities: Any Group 1 course ........................................ 3-4
Math competency: Placement into MTH 111 or higher, or completion of MTH 23 or MTH 23A and MTH 23B ................................. 4
Science: BIO 108 ......................................................... 4
Social Science: ECO 201 or ECO 202 ..................................... 3

**NMC Occupational Specialty Requirements** 
Credits: 27-35
CIT 100 Computers in Business-An Intro (or equivalent) ...................................... 3
NMC directed electives (see program coordinator for appropriate selection) .............. 5-12

**MSU Occupational Specialty Requirements** 
Credits: 8-15
(Select from the following MSU areas of interest.)

**MSU Agricultural Operations Requirements** 
Credits: 35
ABM 130 Farm Management I ......................... 3
AE 131 Agricultural Water Resource Management .......... 3
AE 143 Application of Precision Agriculture Technologies .................. 3
AT 202 Agricultural Regulation, Compliance and Safety .................. 3
AT 293 Professional Internship in Agricultural Technology .............. 3
CSS 101 Introduction to Crop Science .................. 3
CSS 105 Agricultural Industries Seminar ...................... 1
CSS 135 Crop Scouting and Investigations .................. 3
CSS 210 Fundamentals of Soil Science .................. 3
ENT 110 Applied Entomology of Economic Plants .......... 3
PLP 200 Plant Diseases and Their Pathogens .......... 3
A minimum of 4 additional CANR credits must be completed with approval from the Program Coordinator .... 4

**MSU Fruit and Vegetable Crop Management Requirements** 
Credits: 27
AT 202 Agricultural Regulation Compliance and Safety .................. 3
AT 293 Professional Internship in Agricultural Technology .............. 3
CSS 210 Fundamentals of Soil Science .................. 3
ENT 110 Applied Entomology of Economic Plants .......... 3
HRT 206 Training and Pruning Plants .................. 1
HRT 207 Horticulture Career Development .................. 1
HRT 218 Irrigation Systems for Horticulture .......... 3
PLP 200 Plant Diseases and Their Pathogens .......... 3
A minimum of 7 additional IAT approved CANR credits must be completed with approval from the Program Coordinator ................................................................. 7

**MSU Landscape Management Requirements** 
Credits: 27
AT 202 Agricultural Regulation Compliance and Safety .................. 3
AT 293 Professional Internship in Agricultural Technology .............. 3
CSS 210 Fundamentals of Soil Science .................. 3
ENT 110 Applied Entomology of Economic Plants .......... 3
HRT 211 Landscape Plants I .................. 3
HRT 212 Landscape Plants II .................. 3
HRT 213 Landscape Maintenance .................. 2
HRT 218 Irrigation Systems for Horticulture .......... 3
PLP 200 Plant Diseases and Their Pathogens .......... 3

**MSU Viticulture Requirements** 
Credits: 32
AT 202 Agricultural Regulation Compliance and Safety .................. 3
AT 293 Professional Internship in Agricultural Technology .............. 3
ENT 110 Applied Entomology of Economic Plants .......... 3
HRT 232 Principles & Practices of Grape Production I .................. 3
HRT 234 Current Issues in Viticulture & Enology .......... 1
PLP 200 Plant Diseases & Their Pathogens .......... 3
Viticulture and Enology Science and Technology Alliance (VESTA)
Required: Complete 16 credits through VESTA as approved by the Program Coordinator .................. 16

**Program Requirements**  
Minimum Credit Hours: 60

Note: Required – Complete 21 credits from NMC as approved by the Program Coordinator.

**MSU Transfer Students**: Students wishing to transfer to MSU as juniors must meet with the program coordinator during their first semester to alter general education courses to meet MSU requirements.
Respiratory Therapy - RT

Associate in Applied Science Degree through Muskegon Community College NMC Code 712

Northwestern Michigan College is a partner with Muskegon Community College and Munson Medical Center to offer a collaborative program leading to an Associate in Applied Science Degree. All liberal arts and science courses can be taken through NMC. All didactic respiratory classes will be offered at Munson Medical Center via live interactive television from Muskegon Community College. Most clinical courses can be completed at Munson Medical Center. This program is fully accredited by the Joint Review Committee for Respiratory Therapy Education.

The respiratory therapy program begins each fall semester. Enrollment in the program is based on the student meeting the following criteria: overall GPA of 2.0 and proficiency testing in Beginning Algebra and successful completion of ENG 111. Depending on placement test results and high school and/or college transcript evaluation, some prerequisite classes may be required. Class sizes generally begin with 8 students in the Munson interactive classroom.

After completing more than two years of instruction, the therapist student receives the Associate in Applied Science Degree (AAS) from Muskegon Community College. The student must pass the advanced practical examination given by the National Board for Respiratory Therapy in order to receive credentials.

Admission Requirements

Enrollment in any Respiratory Therapy (RT) course requires admission to the Respiratory Therapy program. Consideration for admission requires satisfactory completion of program prerequisites and admission to both Muskegon Community College and the Respiratory Therapy program. Space in the Respiratory Therapy program is limited. Completion of prerequisites does not guarantee admission to the Respiratory Therapy program. Students interested in pursuing a degree in Traverse City for Respiratory Therapy from Muskegon Community College would follow these guidelines for application to and registration in the program.

1. Submit an application to Northwestern Michigan College. Applications are available at www.nmc.edu/admissions or at the Admissions Office (231) 995-1054.
2. Meet with an NMC advisor or Health Occupations Respiratory Therapy Advisor to complete your educational development plan for completing your degree.
3. Complete the basic criteria for admissions to the Respiratory Therapy program including: overall GPA of 2.0 and proficiency testing in Beginning Algebra and successful completion of ENG 111.
4. Apply for Admission to Muskegon Community College and the Respiratory Therapy Program at www.muskegoncc.edu/pages/1928.asp or applications are also available by calling (231) 995-1235.

Technical Management Administration

Associate in Applied Science Degree NMC Code 573

Adding technical training to a business background has long been recognized as a powerful combination in the job market. Technicians often work with non-technical personnel such as accountants, managers, and data processors.

In order to obtain this successful combination of technical and business skills, students who have earned an Associate in Applied Science degree in a technical program may earn a second AAS degree in Technical Management Administration by completing 32 additional credits with a business emphasis.

Please note: This program is available only to students who have already completed an associate degree program in a technical area (Technical, Health, and Visual Communications programs). This program is not available to the student whose first degree is from a Business program.

Previous Technical focused AAS degree Credits: 60-64

Occupational Specialty Requirements 32

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 121</td>
<td>Accounting Principles I</td>
<td>4</td>
</tr>
<tr>
<td>ACC 122</td>
<td>Accounting Principles II</td>
<td>4</td>
</tr>
<tr>
<td>BUS 101</td>
<td>Introduction to Business</td>
<td>3</td>
</tr>
<tr>
<td>BUS 231</td>
<td>Professional Communications</td>
<td>3</td>
</tr>
<tr>
<td>BUS 261</td>
<td>Business Law I</td>
<td>3</td>
</tr>
<tr>
<td>CIT 100</td>
<td>Computers in Business-An Intro</td>
<td>3</td>
</tr>
<tr>
<td>MGT 241</td>
<td>Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>MGT 251</td>
<td>Human Resource Management</td>
<td>3</td>
</tr>
<tr>
<td>MKT 201</td>
<td>Principles of Marketing</td>
<td>3</td>
</tr>
<tr>
<td>Any Business Area Elective (BUS, MGT, MKT)</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Program Information

www.nmc.edu

2015 - 2016 NMC CATALOG 

To apply, use the three-digit NMC Code on your admissions application.
# Visual Communications

## Associate in Applied Science Degree  
**NMC Code 351**

Students in this program explore a full range of skills: drawing, typography, photography, graphic design, illustration technique, animation, film, new media and social media design. In unique, studio like classrooms there are plentiful opportunities for hands-on work including customized projects based on portfolio goals and real-world pieces published in the community. They participate and lead critiques and reviews with peers as well as clients/instructors. Several of the digital courses are led by Apple and Adobe Certified trainers. Apple and Adobe Certification and testing is available and is part of the Time Based Media, Digital Imaging, Digital Graphic Design and Typography classes.

## General Education Requirements  Credits: 18-19

<table>
<thead>
<tr>
<th>Course</th>
<th>Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications: ENG 111 and ENG 112</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Humanities: ART 111 or ART 112 (preferred) or ART 213</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>Math competency: Placement into MTH 111 or higher, or completion of MTH 25 or MTH 23A and MTH 23B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science: Any Group 1 course with a lab</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Social Sciences: Any Group 1 course</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

## Occupational Specialty Requirements  Credits: 45

<table>
<thead>
<tr>
<th>Course</th>
<th>Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 121</td>
<td>Drawing I</td>
<td>3</td>
</tr>
<tr>
<td>ART 131</td>
<td>2-D Design</td>
<td>3</td>
</tr>
<tr>
<td>VCA 100</td>
<td>Materials and Techniques</td>
<td>3</td>
</tr>
<tr>
<td>VCA 125</td>
<td>Typography I</td>
<td>3</td>
</tr>
<tr>
<td>VCA 126</td>
<td>Typography II</td>
<td>3</td>
</tr>
<tr>
<td>VCA 127</td>
<td>Digital Imaging</td>
<td>3</td>
</tr>
<tr>
<td>VCA 146</td>
<td>Interactive Animation or Digital Photography</td>
<td>3</td>
</tr>
<tr>
<td>ART 147</td>
<td>Web Design I</td>
<td>3</td>
</tr>
<tr>
<td>VCA 150</td>
<td>Digital Graphic Design</td>
<td>3</td>
</tr>
<tr>
<td>VCA 200</td>
<td>Visual Communications II</td>
<td>3</td>
</tr>
<tr>
<td>VCA 220</td>
<td>Visual Communications III</td>
<td>3</td>
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<tr>
<td>VCA 225</td>
<td>Visual Communications Studio</td>
<td>3</td>
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<tr>
<td>VCA 230</td>
<td>Visual Communications V</td>
<td>3</td>
</tr>
<tr>
<td>VCA 235</td>
<td>Visual Communications Portfolio</td>
<td>3</td>
</tr>
<tr>
<td>VCA 250</td>
<td>Time Based Media I</td>
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</tbody>
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## Program Requirements  Credits: 63-64

<table>
<thead>
<tr>
<th>Course</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>ART 174</td>
<td>Digital Photography or Interactive Animation</td>
<td>3</td>
</tr>
<tr>
<td>VCA 146</td>
<td>Color Photography I</td>
<td>3</td>
</tr>
<tr>
<td>ART 181</td>
<td>Printmaking I</td>
<td>3</td>
</tr>
<tr>
<td>ART 213</td>
<td>Modern Art History</td>
<td>3</td>
</tr>
<tr>
<td>BUS 155</td>
<td>Interpersonal Communications or Technical Writing</td>
<td>3</td>
</tr>
<tr>
<td>BUS 231</td>
<td>Professional Communications</td>
<td>3</td>
</tr>
<tr>
<td>CIT 180</td>
<td>HTML and CSS Programming</td>
<td>3</td>
</tr>
<tr>
<td>ENG 220</td>
<td>Technical Writing or Creative Writing</td>
<td>3</td>
</tr>
<tr>
<td>ENG 221</td>
<td>Popular Culture</td>
<td>3</td>
</tr>
<tr>
<td>COM 201</td>
<td>Mass Communication and Culture</td>
<td>3-4</td>
</tr>
<tr>
<td>MKT 201</td>
<td>Principles of Marketing or Principles of Advertising</td>
<td>3</td>
</tr>
<tr>
<td>VCA 290</td>
<td>Visual Communications Internship</td>
<td>4</td>
</tr>
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</table>
Welding Technology
Certificate of Achievement (Level II)  NMC Code 036

The Welding Technology courses are designed to meet the needs of the beginning welding students as well as the needs of people who are upgrading their welding skills. Students will develop their skills in this area through laboratory experience using equipment representative of the welding industry. Welding classes can prepare students to be a certified welder, provide a certificate in Welding Technology, or an Associate in Applied Science degree through the Manufacturing Technology program. The welding curriculum includes Oxy-acetylene, Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW), and Gas Tungsten Arc Welding (GTAW), on both ferrous and nonferrous materials.

Certificate Requirements  Credits: 30

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<tr>
<td>MFG 111</td>
<td>Math for Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>WPT 110</td>
<td>Oxy-Fuel Processes Thermal Cutting</td>
<td>3</td>
</tr>
<tr>
<td>WPT 120</td>
<td>GTAW (TIG) Welding I</td>
<td>2</td>
</tr>
<tr>
<td>WPT 121</td>
<td>GTAW (TIG) Welding II</td>
<td>2</td>
</tr>
<tr>
<td>WPT 130</td>
<td>SMAW (Arc) Welding I</td>
<td>3</td>
</tr>
<tr>
<td>WPT 131</td>
<td>SMAW (Arc) Welding II</td>
<td>3</td>
</tr>
<tr>
<td>WPT 140</td>
<td>GMAW (MIG) Welding I</td>
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</tr>
<tr>
<td>WPT 141</td>
<td>GMAW (ARC) Welding II</td>
<td>2</td>
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<td>WPT 142</td>
<td>Flux Cored Arc Welding</td>
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<tr>
<td>WPT 160</td>
<td>Welding Qualification Prep</td>
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<tr>
<td>WPT 160A</td>
<td>Welding Qualification Prep (GMAW)</td>
<td>2</td>
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<tr>
<td>WPT 160B</td>
<td>Welding Qualification Prep (GTAW)</td>
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<tr>
<td>WPT 160C</td>
<td>Welding Qualification Prep (FCAW)</td>
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</tbody>
</table>

Approved elective .................................................... 3

* Level II certificate is set up for students to complete the program requirements in two semesters.

Welding Technology
Certificate of Achievement (Level III)  NMC Code 016

Certificate Requirements  Credits: 45

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>DD 101</td>
<td>Print Reading and Sketching</td>
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<tr>
<td>DD 110</td>
<td>Basic Metallurgy</td>
<td>3</td>
</tr>
<tr>
<td>MFG 111</td>
<td>Math for Manufacturing</td>
<td>3</td>
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<tr>
<td>MFG 113</td>
<td>Machining I</td>
<td>3</td>
</tr>
<tr>
<td>WPT 110</td>
<td>Oxy-Fuel Processes</td>
<td>3</td>
</tr>
<tr>
<td>WPT 120</td>
<td>GTAW (TIG) Welding I</td>
<td>2</td>
</tr>
<tr>
<td>WPT 121</td>
<td>GTAW (TIG) Welding II</td>
<td>2</td>
</tr>
<tr>
<td>WPT 130</td>
<td>SMAW (Arc) Welding I</td>
<td>3</td>
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<tr>
<td>WPT 131</td>
<td>SMAW (Arc) Welding II</td>
<td>3</td>
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<tr>
<td>WPT 140</td>
<td>GMAW (MIG) Welding I</td>
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<tr>
<td>WPT 141</td>
<td>GMAW (MIG) Welding II</td>
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<td>WPT 142</td>
<td>Flux Cored Arc Welding</td>
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<td>WPT 160</td>
<td>Welding Qualification Prep</td>
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<td>WPT 160C</td>
<td>Welding Qualification Prep (FCAW)</td>
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<tr>
<td>WPT 210</td>
<td>Welding Fabrication and Repair</td>
<td>3</td>
</tr>
</tbody>
</table>

Approved elective .................................................... 3

To apply, use the three-digit NMC Code on your admissions application.

NMC. Find it here.
Course Prefixes by Academic Area

Aviation
AVF  Aviation Flight
AVG  Aviation Ground

Business
ACC  Accounting
BUS  Business Administration
CIT  Computer Information Technology
CUL  Culinary Arts
MGT  Management
MKT  Marketing

Communications
ASL  World Language - American Sign Language
COM  Communications
ENG  English
FRN  World Language - French
SPN  World Language - Spanish

Construction Technology
CAR  Carpentry Technology
CMT  Construction Management
EET  Electronical/Electronics Technology
EGY  Renewable Energy
ELE  Electrical Technology
HVA  HVAC/R Technology
PLU  Plumbing Technology

Health Occupations
HAH  Allied Health
HDA  Dental Assistant
HNR  Nursing
HPD  Health Professional Development

Humanities
ART  Art
AUD  Audio Technology
DNC  Dance
HST  History
HUM  Humanities
MUS  Music
PHL  Philosophy
VCA  Visual Communications

Maritime
MDK  Maritime-Deck
MNG  Maritime-Engineering
MNS  Naval Science

Physical Education
HF  Health and Fitness
OUT  Outdoor Pursuits
PE  Physical Education

Science and Mathematics
AST  Astronomy
BIO  Biology
CHM  Chemistry
EGR  Engineering
ENV  Environmental Science
MTH  Mathematics
PHY  Physics

Social Sciences
ANT  Anthropology
CD  Child Development
CJ  Criminal Justice
ECO  Economics
EDU  Education
GEO  Geography
LWE  Law Enforcement
PLS  Political Science
PSY  Psychology
SOC  Sociology
SWK  Social Work

Technical
AT  Automotive
DD  Drafting and Design
MFG  Manufacturing Technology
RAM  Robotics and Automation
WPT  Welding Process Technology

Water Studies
WSI  Water Studies
Reading a Course Description

The semester credit hours followed by (contact hours) are listed on the first line of the course description. Student tuition, in most cases, is based on the course contact hour. Exceptions are MDK, MNG, MNS, Applied Music, Ensembles and private lessons. At the end of the description the course is identified by group number. See graduation requirements on page 48.

In addition to the courses listed in this section, each instructional area within Northwestern Michigan College may offer the following courses:

291 Special Topics
Seminars, lectures, etc. on a selected topic within a field are sometimes offered as special courses. Students may enroll in more than one Special Topics offering but not all four-year schools accept special topics credits. Group 2 course.

NMC Course Descriptions

ACC Accounting

ACC 121 Accounting Principles I ......................... 4.0 (4)
Required prerequisite(s): MTH 23 or placement into MTH 111
Recommended prerequisite(s): BUS 105
This course covers basic principles and procedures in accounting for both a service and merchandising business. It includes the accounting cycle, financial statement preparation, manual accounting systems, petty cash, bank reconciliations, receivables, inventories, and property, plant and equipment. Group 2 course.

ACC 122 Accounting Principles II ..................... 4.0 (4)
Required prerequisite(s): ACC 121
Second semester accounting continues with payroll, current liabilities, partnerships, corporations, bonds, cash flow statements, and statement analysis. Group 2 course.

ACC 221 Intermediate Accounting I .................... 4.0 (4)
Required prerequisite(s): ACC 122
A detailed analysis of the content of financial statements covering problems related to revenue recognition, time value of money, cash, receivables, and inventories including calculation and analysis of financial ratios. US and international reporting standards are compared. This course begins with a brief review of the fundamental accounting process. Group 2 course.

ACC 222 Intermediate Accounting II .................... 4.0 (4)
Required prerequisite(s): ACC 122
A detailed analysis of the content of financial statements covering problems related to property, plant and equipment, investments, current liabilities and contingencies, bonds and long-term notes, leases, income taxes, and shareholders’ equity. US and international reporting standards are compared. Group 2 course.

297 Independent Study
Independent Study provides students the opportunity to explore a topic of study in greater breadth and depth than would be possible in an established College course. Students must seek faculty approval and complete a formal contract that stipulates the student learning outcomes, the activities that will help the student meet those outcomes, and the methods and measures to be employed to assess the student’s performance. The Independent Study will appear on the student’s transcript under the appropriate disciplinary prefix followed by 297. Group 2 course.

ACC 225 Cost/Management Accounting............... 3.0 (3)
Required prerequisite(s): ACC 121
Recommended prerequisite(s): ACC 122, MTH 111
This course introduces the basic concepts and terminology of managerial cost accounting, its nature and tasks. Both job order cost systems and process cost systems are analyzed. The student begins building a knowledge base for managerial cost accounting through the analysis of the theory and practical applications of cost-volume-profit analysis, job costing, budgets and standard costing, and study of internal control systems in a manufacturing setting. Group 2 course.

ACC 231 Federal Income Tax Problems ............... 3.0 (3)
Required prerequisite(s): ACC 122
In this course, the student will learn income tax practices and procedures necessary to prepare an accurate individual income tax return. Basic tax research and planning will be incorporated. Payroll tax laws and procedures will be examined including computing wages and withholdings, computing unemployment taxes and analyzing and journalizing payroll transactions. The course includes preparation of individual and payroll tax returns. Group 2 course.

ACC 241 Principles Fraud Examination............... 3.0 (3)
Required prerequisite(s): ACC 122 with grade of 2.0 or higher
Recommended prerequisite(s): ACC 221, ACC 222, ENG 112
This course is an introduction to the field of forensic accounting. Topics include the history of forensic accounting, the fraud triangle theory, financial statement misrepresentation, and fraud examination techniques, including fraud prevention and control. Students will be exposed to real-world cases in the area of forensic accounting. Group 2 course.

For course availability, refer to www.nmc.edu/class-search | 55
ACC 290  Accounting Internship .......................... 3.0 (3)
Required prerequisite(s): 12 semester credits of accounting in addition to a spreadsheet course. This internship requires the approval of the accounting instructor, a GPA of 3.0 in accounting and a minimum of eight hours per week spent on-site.
Recommended prerequisite(s): ENG 99 or placement into ENG 11/111
The accounting work experience is an elective of the two-year Associate in Applied Science degree in Accounting. The purpose of this work experience course is to provide an opportunity for students to acquire accounting work experience, to apply their skills in a real work setting, and to build ties with the business/professional community. Students spend 10 hours per week in this paid or non-paid, supervised on-the-job training experience. In addition to the required 150 hours in an accounting site, students participate in brief, reflective writing assignments. Students must apply one month prior to the semester in which they will complete the internship. Group 2 course.

ANT  Anthropology

ANT 102  Underwater Archaeology .......................... 3.0 (3)
Recommended prerequisite(s): ENG 99 or placement into ENG 11/111
This course will provide students with an introduction to theory, method, technologies, and practice in underwater archaeology, with case studies of prehistoric and historical sites worldwide, including the Michigan Great Lakes. This is a lecture-based course that provides a specialization in anthropology and the applied social sciences. This course also qualifies for NAS Part 3 credits. No diving is required. Group 2 course.

ANT 113  Intro to Cultural Anthropology .......................... 3.0 (3)
Required prerequisite(s): ENG 99 or placement into ENG 11/111
The study of the role of society and culture in humankind’s adaptation to a variety of environments is the focus of this course. A variety of cultures are studied, utilizing cross-cultural comparisons. This is an introductory course which provides a broad overview of the four fields of anthropology with some concentration on archaeology. Among topics considered are field methods, theories of cultural evolution, the family, kinship, economics, religion, political organization and language. Group 1 course.

ANT 201  Nautical Archaeology I .......................... 3.0 (3)
Required prerequisite(s): ENG 99 or placement into ENG 11/111
Recommended prerequisite: ANT 102
This is an entry level course to the Nautical Archaeology Society Training Program and is aimed at introducing nautical archaeology to divers and non divers, and promoting their interest in the subject. It provides the basic training in archaeological survey and project management with the aim of teaching students how to design, plan and run their own field work projects. The curriculum will be presented in the classroom and in an open water setting (or onshore site for non-divers) in the field. Group 2 course.

ART  Art/Fine Arts

ART 100  Art Appreciation .......................... 3.0 (3)
This course prepares the student to make sense of the visual arts, with the emphasis on the process of evaluating meaning and value. The student is exposed to the various media and forms with which the artist works. In addition, the student is given a brief overview of the history of art from classical to the present. Group 1 course.

ART 111  History of Western Art I .......................... 4.0 (4)
Recommended prerequisite(s): ENG 111
This course will introduce major trends of Western Art from Pre-History through Greece, Rome and the Middle Ages. Significant works of painting, sculpture and architecture will be presented within the social, political and cultural context of each period. Group 1 course.

ART 112  History of Western Art II .......................... 4.0 (4)
Recommended prerequisite(s): ENG 111
This course is designed to introduce major trends in Western Art from the Renaissance through Modernism to the present. Significant works of painting, sculpture and architecture will be presented within the social, political and cultural context of each period. Group 1 course.
**ART 121  Drawing I** .................................................. 3.0 (4)

*Recommended prerequisite(s): Students are encouraged to have good reading skills or seek help.*

Drawing I introduces the students to basic drawing skills and techniques through the use of line, form, composition, perspective and the use of chiaroscuro. The course emphasis is on using drawing as a vehicle for seeing and communicating. Students will learn to judge proportions, create volume, depict the illusion of space and to analyze their own work as well as others. Black and white dry medium will be used for all assignments. **Group 2 course.**

**ART 122  Drawing II** .................................................. 3.0 (4)

*Recommended prerequisite(s): ART 121

**Required prerequisite(s): Students are encouraged to have good reading skills or seek help.***

Course will explore advanced methods in drawing including the effects of lighting, multiple panel design and conceptualizing of compositions with an emphasis on the use of new media and developing a personal style. Advanced use of color media and theory will also be explored in this course. Assignments will include still life and object studies designed by both the instructors and students. **Group 2 course.**

**ART 131  2-D Design** .................................................. 3.0 (4)

*Recommended prerequisite(s): Students are encouraged to have good reading skills or seek help.*

Course will study the concepts and theory of two-dimensional design, pattern, and color as they apply to visual perception and communication. Students will study visual structure, color and their application. **Group 2 course.**

**ART 132  3-D Design** .................................................. 3.0 (4)

*Recommended prerequisite(s): ART 131

**An introduction to the elements of construction and production of three-dimensional design. Shape, volume, mass, and interaction of forms and colors will be studied within a variety of conceptual models, e.g. architecture, sculpture, package design, display, etc. Group 2 course.**

**ART 151  Ceramics I** .................................................. 3.0 (4)

This is an introductory course consisting of instruction and development of hand-building skills and basic ceramic design. Students prove critical thinking and development of technical skills by completing hand building projects that include: sets, complex shapes (made from multiple shapes), relief, pouring vessels, and a detailed sketchbook that includes research and design focused on each project. Functional pottery, sculpture, and hybrids of these forms will be the focus of this course. **Group 2 course.**

**ART 152  Ceramics II** .................................................. 3.0 (4)

*Recommended prerequisite(s): ART 151

**This course is an advanced studio intensive class that builds on the skills and knowledge developed in Ceramics I. Advanced projects using hand building and wheel throwing techniques will be completed for assessment. Projects will include the concepts of sets, bottle forms, wheel throwing, the human figure, and large stacking forms. Sketchbook/sourcebook documentation of research and design will be required. Group 2 course.**

**ART 161  Painting I** .................................................. 3.0 (4)

*Recommended Prerequisite(s): Students are encouraged to have good reading skills or seek help.*

This course will introduce concepts of painting as well as principles of design, and the development of painting techniques. Students will be given projects/problems throughout the semester ending with a painting that incorporates the combined skills. Oil and/or acrylic paints will be used. **Group 2 course.**

**ART 162  Painting II** .................................................. 3.0 (4)

*Recommended prerequisite(s): ART 161

**Recommended Prerequisite(s): Students are encouraged to have good reading skills or seek help.***

This course will continue to investigate the concepts of Painting I as well as elements of design, including the development of a personal style. Students will deal with more complex painting concepts, including a deeper understanding of color challenges. This course is designed to give a more independent/individual approach (than Painting I). Students will work in oil or acrylic paint. **Group 2 course.**

**ART 165  Watercolor Painting I** .................................. 3.0 (4)

An introduction to the techniques and materials of watercolor painting. Includes use of creative effects, additive and subtractive approaches, and mixing of color to create effective paintings in a step-by-step manner. **Group 2 course.**

**ART 166  Watercolor Painting II** .................................. 3.0 (4)

*Recommended prerequisite(s): ART 165

**Watercolor II deals with advanced problems in watercolor painting with special emphasis on individual development and creativity particularly in the area of compositional conceptualization. Group 2 course.**

**ART 174  Digital Photography** .................................... 3.0 (4)

*Recommended Prerequisite(s): College level reading and writing

**The learner will gain a strong understanding of light, and how it illuminates the subject, become proficient in the use of the adjustable digital camera and demonstrate, explain and craft both the history and the creative process of photography. Visual learning will allow the development of a b+w and color core of composition. Group 2 course.**

**ART 175  Color Photography I** .................................... 3.0 (4)

*Recommended prerequisite(s): ART 174

**Recommended prerequisite(s): College level reading and writing**

**Color Photography I is an intermediate photography course covering the basics of working with photographs in digital color form. Specific topics will include understanding the digital process and the controls available to maximize image quality, image enhancement using software programs (Adobe Photoshop), color theory as it applies to both image making and image enhancement, color management, and output to digital prints. Group 2 course.**
ART 181  Printmaking I ................................. 3.0  (4)
Printmaking I is an introductory survey course that introduces the students to a wide variety of print media: relief, intaglio, embossing and monotype. Students will gain knowledge of the history, conception, production and presentation of achromatic prints. Group 2 course.

ART 182  Printmaking II .................................. 3.0  (4)
Required prerequisite(s): ART 181
Recommended prerequisite(s): Students are encouraged to have good reading skills or seek help.
Printmaking II expands on processes and concepts explored in Printmaking I with the emphasis on more complex techniques, including lithography, drypoint, and collagraphs. Students will refine their technical skills and concepts begun in Printmaking I. Students will explore contemporary printing techniques and issues. Group 2 course.

ART 213  Modern Art History ............................ 3.0  (3)
Recommended prerequisite(s): ENG 111
This course examines the history of art from the beginning of the 20th century to the present. Emphasis is placed on the continuing connection between modern art movements and the relationship of art to current social and cultural contexts. Group 1 course.

ART 221  Life Drawing I .................................... 3.0  (4)
Required prerequisite(s): ART 121
Recommended prerequisite(s): ART 122
Life Drawing I involves comprehensive studies in drawing the human figure with a variety of materials and discusses the solution of the problems of figure drawing used to advance the general qualities of grace, rhythm, and form. Explorations include gesture drawing, contour drawing and drawing the figure in motion. Life Drawing I will work primarily in charcoal and pencil. Group 2 course.

ART 222  Life Drawing II .................................... 3.0  (4)
Required prerequisite(s): ART 221
Recommended prerequisite(s): Students are encouraged to have good reading skills or seek help.
Life Drawing II is an advanced study of problems in drawing the human figure in multiple views and in longer studies with an accent on composition and dealing not only with the model but the environment the model is in. Life Drawing II will include the introduction of color and wet media. Group 2 course.

ART 275  Color Photography II .................................. 3.0  (4)
Required prerequisite(s): ART 175
Recommended prerequisite(s): College level reading and writing
Color Photography II is an advanced photography course dealing with the use of digital photographic tools and techniques to create artistic work. On the technical side, specific topics will include advanced tools for image control, advanced features in software digital imaging programs (Adobe Photoshop, plugins), color management in the digital environment and multiple options for the output of work in a variety of forms. On the artistic side, the work will be to create an extended, coherent visual project that reflects the vision of the student. Group 2 course.

ASL 101  American Sign Language I .................. 4.0  (4)
Recommended prerequisite(s): You will be required to communicate in sign language; need a minimal amount of technological knowledge and skill to take advantage of outside-of-class requirements; need to be able to play a course-required DVD; and need internet access as much of the course is supported by Moodle.
ASL 101 introduces students to the language and culture of Deaf people in the United States and most of Canada. This course will focus on building vocabulary and dialogue structures needed for introductory conversation about purposeful topics, the use of non-manual grammatical markers such as facial expression, use of finger spelling and numbers, and an introduction to the rich history and culture of the Deaf community. Students will participate in interactive classroom activities using a “voices off” policy to ensure ASL immersion. Group 2 course.

ASL 102  American Sign Language II .................. 4.0  (4)
Required prerequisite(s): ASL 101 or instructor permission
Recommended prerequisite(s): You will be required to communicate in sign language; need a minimal amount of technological knowledge and skill to take advantage of outside-of-class requirements; need to be able to play a course-required DVD; and need internet access as much of the course is supported by Moodle.
ASL 102 furthers student knowledge and experiences of the language and culture of Deaf people in the U.S. and much of Canada. The introduction of additional vocabulary and grammar structures furthers students’ ability to communicate meaningfully with ASL users. Students will develop greater insight into the Deaf culture through the context of ASL literature, and current topics relevant to the Deaf community are explored. “Voice off” policy is used for more extended periods of time. While developing communications skills, students will simultaneously mature in their understanding of the Deaf experience. Group 2 course.

ASL 103  American Sign Language III .................. 4.0  (4)
Required prerequisite(s): ASL 102 or instructor permission
Recommended prerequisite(s): You will be required to communicate in sign language; need a minimal amount of technological knowledge and skill to take advantage of outside-of-class requirements; need to be able to play a course-required DVD; and need internet access as much of the course is supported by Moodle.
ASL 103 is a continuation of ASL 101 and 102, expanding the emphasis on ASL grammar, vocabulary development, and Deaf culture. Dialogue, short stories narratives, and short conversation, both receptive and expressive, will be featured through the course. Meaningful conversational topic development is emphasized. Group 2 course.
ASL 104 American Sign Language IV ............... 4.0 (4)
Required prerequisite(s): ASL 103 or instructor permission
Recommended prerequisite(s): You will be required to communi-
cate in sign language; need a minimal amount of technological
knowledge and skill to take advantage of outside-of-class re-
quirements; need to be able to play a course-required DVD; and need
internet access as much of the course is supported by Moodle.
ASL 104 is a continuation of ASL 101, 102 and 103. Students
will further develop ASL grammar, vocabulary development,
and Deaf culture. Dialogue, short stories, narratives, and short
conversation, both receptive and expressive, will be featured
through the course. Meaningful conversational topic develop-
ment is emphasized. Group 2 course.

AST  Astronomy

AST 100 Observational Astronomy ..................... 2.0 (2)
Recommended prerequisite(s): Students are encouraged to have
high school reading and writing skills, mathematical skills to
perform simple single-variable computations, and minimal
geometric understanding.
This is an introduction to astronomy. The goal of this course
is to acquaint the student with the constellations, solar system
objects and their motions, the celestial sphere concept and
coordinate system. Stars, star clusters, nebulae and galaxies are
also studied. Students will use naked-eye observations as well
as telescopes, spectrograph, photometer and CCD camera to
observe and report findings. Each session includes training in
the operation of equipment. Group 2 course.

AST 109 Planetary Astronomy ............................ 4.0 (3)
AST 109L Planetary Astronomy Lab .................. 0.0 (2)
Required prerequisite(s): ENG 99
Recommended prerequisite(s): ENG 11/111, may be taken
concurrently and MTH 111
Corequisite(s): AST 109 and AST 109L
Characteristics and properties of the solar system and its com-
ponents are presented to students in the context of the history
of discovery. This information is integrated with student
observational data to develop a mathematical model in the
laboratory. The model is developed by incorporating equations
used to compute characteristics and properties of solar system
components. The model is utilized by students to encour-
age understanding of why the solar system has evolved to its
current state by evaluating the effects of changes in values of
fundamental measured properties and characteristics.
Group 1 lab course.

AST 119 Astronomy ......................................... 4.0 (3)
AST 119L Astronomy Lab ............................... 0.0 (2)
Required prerequisite(s): ENG 99
Recommended prerequisite(s): ENG 11/111, may be taken
concurrently and MTH 111
Corequisite(s): AST 119 and AST 119L
History of discovery of the nature of the cosmos and its con-
tents is the format utilized to develop understanding of the
nature of stars and the universe, and the physical principles
determining this nature. These principles underlie our pro-
ficiency for prediction of the nature of the universe and our
ability to make observations of our universe. The principles
are analyzed by means of a student developed mathematical
model incorporating the quantitative relationships derived
by physicists and astronomers. Observations provide students
with the sky knowledge and data necessary for prediction of
stellar characteristics. Group 1 lab course.

Visit www.nmc.edu/science-math
for detailed information.

AT  Automotive Technology

AT 100 Automotive Service Basics ..................... 2.0 (2)
Required prerequisite(s): ENG 99, MTH 08
This is the first course in the Automotive Service Program.
Engine theory, cooling systems, and lube requirements will
be covered. Bolts, micrometers and basic specialty tools are
integrated into the class. Training in the use of acetylene torch
equipment will be taught along with it’s use in the automotive
field. Students who passed a prior approved high school tech
prep program will not be required to take this course. This
course is designed to prepare the student to enter the auto-
motive program. Group 2 course.

AT 110 Automotive Brake Systems .................... 5.0 (7)
Required prerequisite(s): AT 100, may be taken concurrently
This course covers theory, components, nomenclature, and
service of automotive brake systems. Students will use standard
skills to diagnose hydraulic systems, drum and disk brakes,
power assist units and systems. The study and repair of mod-
ern A.B.S. systems along with the replacement of associated
parts such as wheel bearings will also be covered. Lab work
will include procedures such as the use of brake lathes, brake
line cutting and flaring procedures and the use of electronic
test equipment. Group 2 course.

AT 120 Automotive Electrical I .......................... 5.0 (8)
Required prerequisite(s): AT 100, may be taken concurrently
This course covers basic electricity, circuits, testing equipment,
and solid state electronics. In addition, this course will also
familiarize the student with the operation, testing, and service
of the automotive starting and charging system. This is a com-
bination lecture and lab course using both components and
vehicles for demonstration. Group 2 course.

AT 130 Engine Performance I ........................... 5.0 (8)
Required prerequisite(s): AT 220
This course is designed to familiarize students with the theory
and operation of the automotive ignition and fuel systems.
Topics include: distributors, electronic ignition, distributorless
systems, fuel injection systems, turbochargers and supercharg-
ers. The lab portion provides the student with actual hands
on experience with tune-up, ignition, and fuel system service.
Modern test equipment will be provided and proper diagnos-
tic techniques will be stressed. Group 2 course.
AT 140  Suspension and Steering ……………… 4.0  (6)
Required prerequisite(s): AT 100, may be taken concurrently
This course is designed to familiarize the student with the nomenclature, theory, and service techniques for the modern steering and suspension system. Includes the the repair of MacPherson struts and rack and pinion service. The course will provide the student with actual experience with alignment and tire balancing equipment. Group 2 course.

AT 150  Automatic Transmissions ……………… 6.0  (9)
Required prerequisite(s): Instructor permission required
This course is designed to familiarize the student with hydraulic theory, internal transmission powerflow, electronic control and torque converter operation. All aspects of transmission operation will be covered as well as removal, overhaul and installation procedures. Students will remove, overhaul, dynotest and install actual failed units in the lab. The cause of the failure of these units will be explored in detail. Factory and aftermarket updates to prevent future failures will be taught. Group 2 course.

AT 160  Engine Repair ………………………… 6.0  (8)
Required prerequisite(s): AT 100, may be taken concurrently
This course covers the theory, construction, and repair of the four stroke automotive engine. This will include the proper use of compression and leakage test equipment, precision measuring tools, special engine tools and valve grinding equipment. Lab work includes diagnosis, replacement of external parts and tear down and overhaul of actual failed engines. Group 2 course.

AT 170  Heating and Air Conditioning ………… 4.0  (6)
This course covers the principles of refrigeration with emphasis on the particular problems of application to automotive air conditioning. The course also covers automotive heating systems which include heater cores, blower motors, vent systems and electronic controls for them. The student will learn how to use refrigerant recovery and charging equipment and will have hands on experience in the lab with that equipment. Group 2 course.

AT 180  Manual Drivetrain and Axles ………… 6.0  (9)
Required prerequisite(s): AT 100, may be taken concurrently
This course covers the basic operating principles, construction, power flow and repair of clutches, manual transaxles and drive shafts. Different theory and overhaul will be covered including ring and pinion replacement and set up. Lab work will include hands on repair of late model vehicles including four wheel drive. Group 2 course.

AT 200  Service Dept. Management …………… 2.0  (2)
This course is designed to acquaint the student who plans a career in the automotive service industry with the duties, responsibilities, qualifications, and problems of service department manager. The student will learn general shop organization, types of service, and cost and returns by department.

Time will be devoted to employer-employee and customer relations and instruction in the use of the service manual. Also includes practice in writing and administering various forms such as work orders, rate sheets, etc. Group 2 course.

AT 210  Hybrid Technology …………………… 5.0  (8)
Required prerequisite(s): AT 130 or Certification in Electrical and Engine Tune Up
This course provides a comprehensive systems overview of the operating principles, maintenance, and service of hybrid electric vehicles. Group 2 course.

AT 220  Automotive Electrical II ……………… 5.0  (8)
Required prerequisite(s): AT 120
This course covers advanced automotive electronics with the emphasis placed on operation, troubleshooting, and repair of lighting, gauges, accessories, and power option circuits. Body hardware is covered including diagnostics of modern systems with body control modules. Group 2 course.

AT 230  Engine Performance II ………………. 4.0  (6)
Required prerequisite(s): AT 130
This course covers computerized engine controls including the latest emission control systems. The student will become proficient with the use of scanners, scopes and the latest engine analyzers. The art of diagnostics and troubleshooting will be stressed. The student will have hands on experience in this area including practice using the computer as a source of information. Group 2 course.

AT 240  Unmanned Ground Vehicles ………… 4.0  (5)
Required prerequisite(s): AT 130, AT 220, ENG 111, MTH 111, RAM 120
Recommend prerequisite(s): ENG 112, MTH 121
This course is designed to be a capstone project for students in the Engineering Technology unmanned ground vehicle curriculum specialization. Students enrolled in this project will design and build an unmanned vehicle. The specifics on the type of vehicle will be developed by the instructor and students as part of the course. Students will gain experience in all areas of engineering technology, including design, project management, scheduling, budgeting and fundraising. Group 2 course.

AT 290  Automotive Internship ……………… 3.0  (3)
Required prerequisite(s): 30 credits of program specific courses with GPA of 2.0 or higher
The purpose of the internship is to provide on-the-job training for the student who wishes to pursue a career in a technical field of study. The internship will be customized to meet the learning needs of the student and the job requirements of the sponsoring firm. Students spend 10 hours per week in the paid, supervised on-the-job training experience. In addition to the required 150 hours in a work site, students participate in semi-monthly seminars. Students must apply one month prior to the semester in which they will complete the internship. Group 2 course.
AUD  Audio Technology

AUD 100  Intro to Audio Tech  ........................................... 2.0 (2)
This course consists of one-on-one mentoring in audio technology with our NMC Audio Technology Staff. It is designed to customize the audio tech training experience for each student, helping to identify interests and aptitude, or to provide tutoring as needed. Group 2 course.

AUD 101  Theory for Sound Engineers  .............................. 2.0 (2)
This course is a study of song forms, notation of rhythms, chord symbols, key and time signatures, and familiarization with lead sheets and scores as commonly used in Pop and Jazz. This course will provide students with the knowledge to work in a variety of musical genres and mediums. Group 2 course.

AUD 110  Studio Recording I ............................................. 2.0 (2)
Required prerequisite(s): AUD 100, may be taken concurrently
This course is a combination of the study of audio and recording theory with instruction and practice in audio studio recording techniques. There is an emphasis on developing skills in the use of current technology. Group 2 course.

AUD 111  Studio Recording II ............................................. 2.0 (2)
Required prerequisite(s): AUD 110
This course is a study of audio signal processing theory, history, and application using current industry standard technology. There is an emphasis on developing skills in the operation of hardware and software to manipulate digital audio recordings. Group 2 course.

AUD 120  Digital Audio I .................................................. 2.0 (2)
Required prerequisite(s): AUD 100, may be taken concurrently
This course includes a brief history of MIDI, the MIDI specification and setting up a MIDI studio. Students will learn techniques of MIDI and audio recording and editing, creating MIDI and audio tracks using MIDI software sequencers and Digital Audio Workstations (DAW). This course will present the content required for taking the Logic Level One User Certification exam. Group 2 course.

AUD 121  Digital Audio II .................................................. 2.0 (2)
Required prerequisite(s): AUD 120
Digital Audio II is the continuation of AUD 120, Digital Audio I. This course explores Pro Tools, MIDI recording and editing, then delves further into advanced MIDI editing techniques. The use and operation of control surfaces and MIDI session strategies are explored. Group 2 course.

AUD 130  Live Sound I ...................................................... 2.0 (2)
Required prerequisite(s): AUD 100, may be taken concurrently
This course is an introduction to live sound techniques, including basic properties of sound, sound equipment, signal flow, and system engineering. Group 2 course.

AUD 131  Live Sound II .................................................... 2.0 (2)
Required prerequisite(s): AUD 130
This course is a continuation of live sound techniques, including acoustics properties of sound, sound equipment, signal flow, and system engineering. Group 2 course.

AUD 210  Studio Recording III ........................................... 2.0 (2)
Required prerequisite(s): AUD 111
This course builds on the topics covered in AUD 110 and AUD 111, focusing on the refining and addition of skills in digital audio recording. Students develop competencies in working with hardware and software in audio project-based settings. Group 2 course.

AUD 220  Digital Audio III ............................................... 2.0 (2)
Required prerequisite(s): AUD 121
Digital Audio III is the continuation of AUD 121, Digital Audio II. This course further explores MIDI and audio recording and editing in Logic and Pro Tools, and also delves into an exploration of software sound synthesizers and sampler instruments found in Digital Audio Workstations. Group 2 course.

AUD 230  Live Sound III ................................................... 2.0 (2)
Required prerequisite(s): AUD 131
This course is an advanced exploration of live sound techniques, including room acoustics, digital sound equipment, software analysis, and system engineering. Group 2 course.

AUD 250  Audio Tech Practicum ....................................... 2.0 (2)
Required prerequisite(s): AUD 110, AUD 120, AUD 130
This course is designed to give students practical experience in digital audio recording. Students participate in a variety of recording situations using various hardware and software recording techniques. Students apply techniques used in previous recording, live sound, and digital audio courses. Group 2 course.

AUD 260  Audio Tech Internship ...................................... 3.0 (3)
Required prerequisite(s): AUD 210, AUD 220, AUD 230; or instructor approval
This course is required for the Associate of Applied Science degree in Audio Technology. The purpose of the internship is to provide on-the-job experience for the student who wishes to pursue a career in audio related fields. The internship will be customized to meet the learning needs of the student and the job requirements of the sponsoring firms. Students must apply one month prior to the semester in which they will complete the internship. Group 2 course.

AUD 270  Audio Tech Final Project ................................. 3.0 (3)
Required prerequisite(s): AUD 210, AUD 220, AUD 230
This course is required for the Associate of Applied Science degree in Audio Technology. The purpose of the Audio Tech Final Project course is to provide in-depth intensive training experience in an area of specialization in audio technology. The student will be paired with staff in their area of expertise. Examples are Audio for Worship, Mastering, Audio for Film, Scoring, etc. Group 2 course.
AVF 111 Private Flight
A flight course structured to provide a minimum of 40 dual and solo flight hours to meet the aeronautical experience requirements for a private pilot. Upon completion of this course the student will have attained the FAA Private Pilot Rating. Group 2 course.

AVF 115 Helicopter Private Pilot
Required prerequisite(s): Instructor permission
A flight course structured to provide the necessary dual and solo flight hours to meet the aeronautical experience requirements for the FAA Helicopter Private Pilot rating. This course will be completed upon the student obtaining their Private Pilot Helicopter rating. Group 2 course.

AVF 118 Instrument Flight I
This course is the beginning stage of the Instrument Pilot Rating. The ground work will be laid for students to safely fly by the instruments. Skills and techniques will be gained to effectively move to Instrument Flight II where holding, tracking, and approaches will be learned. Both the aircraft and flight simulator will be used to obtain skills required for this course. Objectives learned will go toward the FAA Instrument Rating. Group 2 course.

AVF 130 Instrument Flight II
Required prerequisite(s): AVF 118
The aircraft and the simulator will be used to teach the required skills. The student will learn tracking, holding, and instrument approaches. At the culmination of this course the student will have gained actual instrument flight time and be a competent instrument pilot and will be signed off for the FAA Instrument check ride. Group 2 course.

AVF 141 Introduction to UAS
Students will be introduced to the world of Unmanned Aerial Systems. This course takes a look at everything from current Unmanned Aircraft Systems to future civilian applications. In addition to learning about this new industry, students will be introduced to flying remotely piloted aircraft and operating entry level Unmanned Aerial Vehicles. Group 2 course.

AVF 230 Commercial Flight I
Required prerequisite(s): Instrument Flight Rating
The student will advance their skills required by the FAA to obtain a Commercial Pilot Certificate. They will gain experience in different aircraft with the opportunity to gain a Tailwheel Endorsement or Seaplane Rating. Students will increase their instrument proficiency while conducting cross country flights. Group 2 course.

AVF 232 Commercial Flight II
Required prerequisite(s): AVF 230
A flight course structured to provide a minimum of 45 dual and solo flight hours to partially fulfill the flight hour requirements for the FAA Commercial Pilot Certificate. This course will provide a review of VFR and IFR cross country navigation procedures and introduce the student to multi-engine flight. Group 2 course.

AVF 234 Commercial Flight III
Required prerequisite(s): AVF 232
This course is the last of three flight courses required to obtain the FAA Commercial Pilot Certificate. This course consists of approximately 18 flight hours with an emphasis on commercial flight maneuvers in preparation for the Commercial Pilot FAA Practical Test. Upon completion of this course, the student will have attained the FAA Commercial Pilot Certificate. Group 2 course.

AVF 237 Helicopter Commercial Pilot
Required prerequisite(s): AVF 234, may be taken concurrently
A flight course structured to provide the necessary dual and solo flight hours to meet the aeronautical experience requirements for the FAA Helicopter Commercial Pilot rating as an add on rating to the FAA Commercial Airplane Single Engine rating. This course will be completed upon the student obtaining their Commercial Pilot Helicopter rating. Group 2 course.

AVF 241 UAS II
Required prerequisite(s): AVF 141 and either AVG 210 or AVG 261
Students will apply what they have learned in previous courses by working largely in the field conducting simulated and real life flight missions. This course focuses on applying Unmanned Aerial Systems to future civilian applications such as inspections, aerial mapping and aerial photography. Group 2 course.

AVF 271 Multi-Engine Flight
Required prerequisite(s): Private Pilot Rating
This flight course involves approximately 10 flight hours in an airplane/simulator and 5 ground hours and is designed to give the student the aeronautical knowledge, proficiency, and experience required to meet the FAA Practical Test Standards for the Private or Commercial Multi-engine rating. Upon completion of this course, the student will have attained the FAA Airplane Multi-Engine Land Rating. Group 2 course.
AVF 274  Tailwheel Flight................................. 1.0 (1)
Required prerequisite(s): Private Pilot Rating
This course is designed to provide the student with the skills, knowledge, and experience to receive a logbook endorsement to fly tailwheel aircraft. Group 2 course.

AVF 275  Seaplane Flight................................. 2.0 (2)
Required prerequisite(s): Private Pilot Rating
In this course, the student will gain the skills, knowledge, and experience to receive endorsement for the FAA Practical Test. Students will learn in a Piper Super Cub on floats as they demonstrate maneuvers and landings. Group 2 course.

AVF 281  Advanced Cross Country Flight............. 2.0 (3)
Required prerequisite(s): Multi-Engine Rating
Recommended prerequisite(s): Commercial Pilot Rating
Students will be exposed to various terrain and weather conditions while accomplishing 50 hours of multi-engine cross country flight. They will be responsible for all aspects of flight planning, ground handling of the aircraft and management of cargo and passengers as necessary. All flight lessons will be conducted with a Multi-Engine Flight instructor. Group 2 course.

AVF 283  Upset Maneuver Training.................... 1.0 (1)
Required prerequisite(s): Private Pilot Rating
In this course the student will learn the foundations to safely perform basic aerobatic maneuvers. Also, the student will gain confidence and skills necessary to recover from various unusual flight attitudes that will increase the student’s overall flight safety. Group 2 course.

AVF 284  Instrument Flight Instructor................. 2.0 (2)
Required prerequisite(s): Flight Instructor Rating
The student perfects both teaching and instrument flying skills while sitting in the right seat of the cockpit. The student develops the knowledge and ability to teach others instrument flying procedures. Training utilizes instrument equipped aircraft and a Frasca simulator. The course consists of 10-20 hours of flying and 10-20 hours of ground time. Group 2 course.

AVF 285  CRM Flight....................................... 2.0 (3)
Required prerequisite(s): Multi-Engine Rating
Recommended prerequisite(s): Commercial Pilot Rating
Students will learn the principles of Crew Resource Management (CRM) with 50 hours of flight in a multi-engine aircraft, including the challenge and response concepts used in corporate, regional, or major airlines. Lessons will explore decision making during normal, adverse, or unplanned conditions during all phases of flight. Students will be in the role of both Captain and First Officer. All flight lessons will be conducted with a Multi-Engine Flight Instructor. Group 2 course.

AVF 382  Flight Instructor Rating....................... 4.0 (4)
Required prerequisite(s): Commercial Pilot with Instrument Rating
In this course the student will learn the skills to be a Certified Flight Instructor (CFI). They will master the skills of the Private and Commercial Pilot ratings. In addition they will learn how to become a certified flight instructor and understand all FAA rules and regulations that accompany being an instructor. The student will learn in this course through the use of the simulator and aircraft. Group 2 course.

AVG 101  Aviation Ground ............................... 5.0 (5)
A course of study that will provide the aeronautical knowledge required of a private pilot and prepare the student to take the FAA Private Pilot written examination. Topics include: aerodynamics, engine and aircraft systems, airport operations, weight and balance, aircraft performance, Federal Aviation Regulations, meteorology, airspace, navigation, and flight physiology. Group 2 course.

AVG 161  Mechanics for Pilots ............................ 3.0 (3)
Recommended prerequisite(s): Private Pilot Rating
This course will teach the students about the systems, components, safe repair, and regulations involved with maintaining and operating small aircraft. Students will learn in the classroom and in the maintenance hangar. Group 2 course.

AVG 190  Aviation Weather ............................... 3.0 (3)
Recommended prerequisite(s): AVG 101
This course offers thorough coverage in the application and analysis of meteorological charts and how they pertain to aviation. It emphasizes the need for advanced knowledge on how NWS/NOAA charts are derived and how to understand their use in aviation today. Additional emphasis will be placed on predominant weather patterns, associated weather and planning flights to avoid severe weather. A basic understanding in the theory of meteorology is desired. Group 2 course.

AVG 202  Advanced Aircraft Systems................... 3.0 (3)
Recommended prerequisite(s): AVG 101
This course is designed to prepare those students seeking to be career pilots to be successful in the intense aircraft systems ground schools offered by the airlines, manufacturers, and private training providers such as Flight Safety. Each major system of large turbine aircraft will be studied, first, in a general overview and then for a specific model, large transport category, jet aircraft. Group 2 course.

AVG 204  Airline Aircraft Ground School............. 3.0 (3)
Recommended prerequisite(s): AVG 202
This course is designed to prepare those students seeking to be career pilots to be successful in the intense aircraft ground schools provided by the airlines. Canadair Regional Jet systems, limitations, normal and emergency checklist, and flows and flight procedures will be covered. Group 2 course.
AVG 210  
UAS I  
Required prerequisite(s): AVF 141  
Recommended prerequisite(s): AVG 101  
This course will guide students deeper in to the Unmanned Aerial Systems Industry. Topics will include Federal Regulations for UAS, components of Unmanned Aerial Vehicles, autopilot programming and flight plan development. Students will be working with UAS autopilot simulators and also be introduced to flying professional UAS systems. Group 2 course.

AVG 231  
Aviation Law  
A study of fundamental legal and aviation law principles as they apply to the various segments of the aviation industry. There will be special emphasis on contemporary aviation legal issues. The highlight of the course will be a mock court where the students, acting as plaintiff and defense attorneys, will argue an actual aviation civil case before an impartial jury. Group 2 course.

AVG 240  
Corporate Aviation Ground  
Recommended prerequisite(s): AVG 202  
Students taking this course will learn about the aspects of corporate aviation. Aircraft, regulations, business customs, and future outlooks of corporate aviation will be presented. Group 2 course.

AVG 251  
Commercial Ground School  
Recommended prerequisite(s): AVF 111 or Private Pilot Rating  
An advanced study of aviation topics including GPS, meteorology, radio communications, airspace, and Federal Aviation Regulations. In addition, aircraft systems, career opportunities, aviation safety, aircraft weight and balance, performance charts, and aerodynamics are reviewed with emphasis on commercial pilot operations. Group 2 course.

AVG 252  
Instrument Ground School  
Recommended prerequisite(s): AVF 101 or Private Pilot Rating  
A course of study that will provide the aeronautical knowledge required for the instrument rating and prepare the student to take the FAA Instrument Rating-Airplane written examination. Topics include: flight instruments, radio navigation, departure, enroute, and arrival procedures, VOR, NDB, ILS, and GPS approaches, IFR emergencies, aviation weather, and IFR cross-country flight planning. Group 2 course.

AVG 285  
Crew Resource Dynamics  
Required prerequisite(s): AVG 251, may be taken concurrently  
An introduction to the principles of crew resource management (CRM). This course will acquaint students with the concepts and skills required of aircrew members in safely operating multi-place aircraft. Topics will include flight safety concepts, communications skills, effective teamwork principles, personality types, and aircraft accident case studies. Students will practice CRM concepts in the Frasca flight training device. Group 2 course.

AVG 381  
Instructor Ground School  
Recommended prerequisite(s): AVG 251  
A course of study that will provide basic education principles and a review of the aeronautical knowledge required for the flight instructor (airplane single engine) certificate and prepare the student to take the FAA Fundamentals of Instruction (FOI) and the Flight Instructor-Airplane Single Engine written examinations. Through classroom presentations and one-on-one student teaching, students will gain practical teaching experience. Group 2 course.

BIO 106  
Human Biology  
How to select a first course in Biology:  
If you are in a transfer program requiring a full year of introductory biology such as pre-med, pre-dental, pre-vet, agriculture, wildlife and fisheries, or environmental programs, you should choose:  
• BIO 115 Cell, Plant and Ecosystem Biology  
• BIO 116 Genetics, Evolution and Animal Biology  
If you need a one semester laboratory science course to fulfill a basic education requirement, you should choose:  
• BIO 110 Essential Biology  
All of the above include a common core that is basic to the understanding of any branch of biology. The core topics include cell structure and function, genetics, the chemical and physical principles governing life processes, and evolution. Any 100-level Biology course may serve as a prerequisite for 200-level Biology courses.

It has been the experience of the Biology Department that students with COMPASS scores below MTH 23 and ENG 111 levels have difficulty successfully completing introductory-level biology courses. If your COMPASS scores are below these levels, the Biology Department recommends that you complete ENG 99, ENG 108 or ENG 111 and MTH 08 before enrolling in any biology course. If your COMPASS scores are below these levels and you decide to enroll in a Biology course, allow yourself additional time for study and preparation. If you are unsure of your ability, consult your advisor, or a biology instructor.

BIO 106L  
Human Biology Lab  
Corequisite(s): BIO 106 and BIO 106L  
Recommended prerequisite(s): Students scoring below MTH 23 and ENG 111 levels on the placement test should plan on additional study time.  
A survey of Human Anatomy and Physiology with a primary focus on health and disease. Topics to be discussed will include the cell structure, simple chemistry of biology, homeostasis, the organ systems, genetics, nutrition, exercise physiology, cancer, heart disease, immunology and other topics of current interest. This course does not meet the requirements for the Nursing program. Consult an advisor before enrolling. Group 1 lab course.
BIO 108  Plant Biology ........................................ 4.0 (3)
BIO 108L  Plant Biology Lab .................................... 0.0 (2)

Corequisite(s): BIO 108 and BIO 108L.
Recommended prerequisite(s): It is highly recommended that students have completed, or are concurrently enrolled in MTH 23 and ENG 111. Students enrolling in BIO 108 that have not met these requirements should plan on additional study time, and may need to seek additional help.

Since almost all life on earth depends upon photosynthesis, this course places its emphasis on the fascinating world of plants. It includes a study of plant structure, growth, development, propagation and scientific concepts on which horticulture is based. Laboratory exercises will include greenhouse work.

Group 1 lab course.

BIO 110  Essential Biology ....................................... 4.0 (3)
BIO 110L  Essential Biology Lab .................................. 0.0 (2)

Corequisite(s): BIO 110 and BIO 110L.
Recommended prerequisite(s): It is highly recommended that students have completed, or are concurrently enrolled in MTH 23 and ENG 111. Students enrolling in BIO 110 that have not met these requirements should plan on additional study time.

Essential Biology is geared toward the non-major. The course will cover broad areas of biology and engage the student in how biology relates to their own life, and how science and society interact. Core concepts covered include: evolution, structure and function, information flow, exchange and storage, pathways and transformations of energy and matter and living systems. Group 1 course.

BIO 115  Cell, Plant & Ecosystem Biology ..................... 4.0 (3)
BIO 115L  Cell, Plant & Ecosystem Biology Lab ............ 0.0 (3)

Corequisite(s): BIO 115 and BIO 115L
Recommended prerequisite(s): MTH 111

An introduction to the fundamental concepts of biology, including an investigation of the major kingdoms of life, classification, ecology, botany, cellular anatomy and biochemistry, DNA structure and function, genetic engineering, cloning and stem cell technologies. Laboratory includes field work and investigative exercises which illustrate lecture topics.

Group 1 lab course.

BIO 116  Genetics, Evolution & Animal Bio .................. 4.0 (3)
BIO 116L  Genetics, Evolution & Animal Bio Lab ............ 0.0 (3)

Corequisite(s): BIO 116 and BIO 116L

Recommended prerequisite(s): BIO 115, MTH 111

This lecture and lab course concentrates on cell division, classical genetics as well as evolution and speciation. It also covers the biology of invertebrate and vertebrate animals. The treatment of the topics in this course necessarily assume a degree of familiarity with the basic biological concepts covered in BIO 115. Students who have not completed BIO 115 should expect to spend extra time reviewing these concepts throughout the course. Group 1 lab course.

BIO 208  Microbiology ........................................... 4.0 (3)
BIO 208L  Microbiology Lab ..................................... 0.0 (3)

Required prerequisite(s): Completion of any 100-level BIO course
Corequisite(s): BIO 208 and BIO 208L

Recommended prerequisite(s): ENG 111, MTH 111

Introductory microbe physiology emphasizes human response to disease and the importance of microbes in environmental cycles. Laboratory is included. Group 1 lab course.

BIO 215  Genetics .................................................. 3.0 (3)

Required prerequisite(s): Completion of any 100-level BIO course
Recommended prerequisite(s): ENG 111, MTH 111

Continuation of general biology genetics. Classical genetics will be covered in addition to an in-depth study of molecular genetics, recombinant DNA and human inheritance. A major emphasis will be on the current state of genetic research. Population genetics will also be covered. Group 1 course.

BIO 220  Nutrition in Human Health ............................ 3.0 (3)

Recommended prerequisite(s): MTH 111, ENG 111 and completion of any 100-level BIO course

This course is an exploration of the fundamentals of nutrition: energy nutrients, vitamins and minerals. Function and sources are each presented, as well as the role each plays in maintaining health. Students complete their own Food Intake Record and use this information throughout the semester so as to better understand human nutrition. Students will study the role nutrition and other lifestyles play in relation to the prevention and protection from disease. Discussion also includes the relationship between nutrition and fitness. Group 2 course.
BIO 227  Human Anatomy & Physiology I ........... 4.0 (4)
BIO 227L Human Anatomy & Physiology I Lab .... 0.0 (2)
Required prerequisite(s): MTH 111; ENG 111/111 or ENG 111 may be taken concurrently
Corequisite(s): BIO 227 and BIO 227L.
Recommended prerequisite(s): It is highly recommended that students have completed any 100-level Biology course and CHM 101. Students enrolling in BIO 227 that have not met these requirements should plan on additional study time.
Please note Pre ADN program requirements.
This course will include an introduction to cells, histology, biochemistry and homeostasis. In addition, the following systems will be discussed: integumentary, skeletal, muscle, nervous, and special senses. Lecture will be accompanied by lab work and applications, which will stress the anatomy, histology and function of these organ systems. Group 1 lab course.

BIO 228  Human Anatomy & Physiology II .......... 4.0 (4)
BIO 228L Human Anatomy & Physiology II Lab ... 0.0 (2)
Required prerequisite(s): BIO 227
Corequisite(s): BIO 228 and BIO 228L.
Recommended prerequisite(s): It is highly recommended that students have good reading skills or plan on additional study time.
This is the second part of a two-semester course. The second semester will include major systems in the body including: the endocrine system, cardiovascular system, lymphatic system, respiratory system, digestive system, metabolism, urinary system, fluid balance, reproduction and inheritance. Lecture will be accompanied by lab work, which will stress the anatomy and histology of these organ systems. Group 1 lab course.

BIO 240  Normal and Clinical Nutrition.......... 3.0 (3)
Recommended prerequisite(s): BIO 227, MTH 08 or equivalent
Nutrition is considered from a strong biological point of view. Discussions will include a brief overview of principles of normal nutrition and then will proceed to how these principles apply to cause and treatment of specific disease states and the nutrition care process required. Group 2 course.

BIO 250  Natural History of Vertebrates ............ 4.0 (3)
BIO 250L Natural History of Vertebrates Lab....... 0.0 (3)
Corequisite(s): BIO 250 and BIO 250L.
Recommended prerequisite(s): ENG 111, MTH 111 and completion of any 100-level Biology course
This course introduces students to the biology and diversity of vertebrate species in Michigan. The life history, anatomy, behavior, systematics, ecology and conservation of each group of vertebrates are examined. Field studies, laboratory investigations, and classroom discussion will help students understand the biology of fishes, amphibians, reptiles, birds and mammals, as well as their relationships to particular habitats. Local vertebrates and field study techniques are stressed. Group 1 lab course.

BIO 255  Pathophysiology.............................4.0 (4)
Required prerequisite(s): BIO 228 with 2.0 or higher
Recommended prerequisite(s): BIO 208, HNR 108
This course covers the etiology, progression, and treatment of disease in the human body. Cellular and tissue structure and function are addressed along with the role of the immune system in the body defenses. Disorders and diseases for each body system are covered. Group 1 course.

BIO 260  General Ecology............................5.0 (3)
BIO 260L General Ecology Lab.....................0.0 (4)
Corequisite(s): BIO 260 and BIO 260L.
Recommended prerequisite(s): ENG 111, MTH 111 and completion of any 100-level Biology course
The course is an introduction to the study of the complex relationships between organisms and with the physical conditions under which they live. Students will study the conditions necessary for life, population ecology, community and ecosystem dynamics and ecosystem diversity. Field oriented lab exercises involve observations and data collection followed by analysis. Group 1 lab course.

BIO 268  Biochemistry....................................3.0 (3)
Recommended prerequisite(s): CHM 101
Study of the basic fundamentals of the chemical composition of living matter with application of concepts to normal and abnormal human function. Group 1 course.

Visit www.nmc.edu/science-math for detailed information.

NMC. Find it here.
BUS 101  Introduction to Business .......................... 3.0 (3)
Recommended prerequisite(s): Placement into ENG 99
American business in the twenty-first century is exciting and challenging. Students will be introduced to the variety of opportunities by exploring ownership, free enterprise, the world economy, management, marketing, international business, social responsibility and business ethics, and entrepreneurship. Group 2 course.

BUS 105  Business Math ....................................... 3.0 (3)
Required prerequisite(s): COMPASS placement into MTH 23 or completion of MTH 08 with 2.0 or better
Apply basic mathematical principles to solve problems in modern business practice. Topics include trade pricing, mark-ups, profit and loss, interest, payroll, taxes, and investments, designed for day-to-day business applications. Group 2 course.

BUS 155  Interpersonal Communications .................. 3.0 (3)
Recommended competency: Placement into ENG 99
To be well prepared for employment in the 21st century it will be mandatory for students to demonstrate effective human relations. Individuals who enter the workforce in any field will need to possess interpersonal and customer service skills. The global workplace will demand competence in interpersonal or “soft” skills. Excellent customer service and relationship building skills are a necessary component of overall business communication. Topics include: communication and identity, conflict and communication climates, and how to build and maintain effective relationships with external and internal customers. Group 2 course.

BUS 231  Professional Communications ................... 3.0 (3)
Recommended prerequisite(s): CIT 100, placement into ENG 111
Communicating professionally is a critical skill in a today’s world. This course is designed to help students understand communication theory and its application in their professional lives. Students will develop effective writing skills by analyzing complex issues, organizing thoughts logically, and communicating those ideas concisely—in verbal and written form. Students will also practice effective listening skills, understand the components of a successful job search, and use teamwork skills in solving communication problems. Group 2 course.

BUS 261  Business Law I ...................................... 3.0 (3)
Recommended prerequisite(s): Placement into ENG 111
This course is a study of the U.S. legal system and specific areas of law related to business, with an emphasis on the techniques of legal decision-making. Topics include the judicial system, torts, contracts, and criminal law. Group 2 course.

BUS 290  Business Administration Internship ......... 3.0 (3)
Required prerequisite(s): 30 credits of business courses with a GPA of 2.0 in occupational courses
This course is an requirement for the Associate of Applied Science degree in Business Administration. The objective of the internship is to assess the Business Administration Program Outcomes, and to provide on-the-job experience for the student pursuing a career in business. At the end of the semester students take a third party assessment to measure their knowledge of business operations, the business organization and business procedures. Students will spend 150 hours over the semester in this paid or non-paid, supervised training experience. In addition students will meet with the Experiential Learning Coordinator as needed throughout the semester for: internship support, feedback, review of professional employment document and an internship exit interview. Group 2 course.

CAR 101  Introduction to Carpentry ......................... 3.0 (4)
Recommended Competencies: COMPASS placement into MTH 23 or higher, or co-enrollment in the recommended developmental math course. COMPASS placement into ENG 11/111 or higher, or co-enrollment in the recommended English course.
This course is for the student that has a desire to experience woodworking in the area of basic cabinet and furniture making. Techniques in the usage and maintaining of basic hand and power tools, understanding of how wood movement will affect design of an assembly, application of basic joinery, adhesives, and fasteners in the woodworking completion of this class establishes a foundation in which the student can build simple furniture and cabinets. Group 2 course.

CAR 102  Intro to Woodworking ............................. 3.0 (4)
Recommended competencies: MTH 111 completion or competency
This course is for the student with a strong understanding of hand and power tools used in the craft of woodworking. A desire to expand their knowledge in the aspects involved with basic furniture and cabinet building is a must. Students will be constructing projects that, by design, will challenge those of the advanced beginner and intermediate skill abilities. Students will plan and implement the necessary steps to address the projects’ hardware and joinery requirements. Group 2 course.

CAR 103  Construction Blueprint Reading .............. 3.0 (3)
Recommended Competencies: COMPASS placement into MTH 23 or higher, or co-enrollment in the recommended developmental math course. COMPASS placement into ENG 11/111 or higher, or co-enrollment in the recommended English course
Students will learn the skills needed to read and understand construction drawings, as well as an understanding of manufacturer’s literature of component parts used in buildings. Both commercial and residential construction materials and drawings are studied.

For course availability, refer to www.nmc.edu/class-search
CAR 105  Foundations and Framing ..................... 3.0 (4)
Recommended Competencies: COMPASS placement into MTH 23 or higher, or co-enrollment in the recommended developmental math course. COMPASS placement into ENG 11/111 or higher, or co-enrollment in the recommended English course
Through structured classroom and hands-on skill building, the student will learn foundation design, lay-out, concrete materials, forms and applications, floor, wall, ceiling and roof framing and basic stair layout. Group 2 course.

CAR 121  Exterior Construction ......................... 3.0 (4)
Recommended Competencies: COMPASS placement into MTH 23 or higher, or co-enrollment in the recommended developmental math course. COMPASS placement into ENG 11/111 or higher, or co-enrollment in the recommended English course
Through structured classroom and hands-on skill building, the student will learn about roofing materials and applications, window and door installation, siding, cornice design and installation, gutters, downspouts, decks and fences. Group 2 course.

CAR 125  Interior Construction ......................... 3.0 (4)
Recommended Competencies: COMPASS placement into MTH 23 or higher, or co-enrollment in the recommended developmental math course. COMPASS placement into ENG 11/111 or higher, or co-enrollment in the recommended English course
Through structured classroom and hands-on skill building, the student will learn about drywall products, installation, and finishing, wall panels, tile, suspended ceilings, finish trim, flooring and cabinet and countertop installation. Group 2 course.

CD 101  Early Childhood Education ...................... 3.0 (3)
This course familiarizes students with the history and present state of early childhood education, from birth to 10 years of age. An overview of child development theories is presented in the context of the role of the educator/caregiver. Resources and careers, and contemporary issues such as school readiness and exploration of various education philosophies are also included. Early Education environment observations are required as well as a working general education philosophy. The observations are set by students to meet their schedules. Group 2 course.

CD 202  Human Growth and Development .............. 5.0 (5)
Recommended prerequisite(s): CD 101 or PSY 101
This course focuses on the issues related to child development. It examines the reasons for child study and its influence on families and education. The interactions between all the developmental domains will be studied from conception up to adolescence. Students will become familiar with the most recent research, and design their own field observation and projects that support and test current theories of development. In addition, students will explore how professional work with children is changing and how they can become advocates for the well-being of children and families in their community, nation and the world. Group 2 course.

CD 203  Guiding Young Children ....................... 3.0 (3)
Recommended prerequisite(s): CD 101
This course examines the preparation and implementation of a positive social and emotional learning environment. Students will explore the development and use of effective guidance and discipline techniques for the young child. Special emphasis is placed on the development of strategies for positive personal interactions with children. Current concepts and approaches that directly relate to the mental health of the child and his/her family are explored. Anger management and conflict resolution skills are especially emphasized through the building of positive environments. Field observations are required and are set by students to meet their schedules. Group 2 course.

CD 204  Early Childhood Curriculum .................. 3.0 (3)
Recommended prerequisite(s): CD 101
An active learning approach is used to develop student’s skills in planning, implementing and evaluating developmentally appropriate learning experiences for children ages two-and-a-half to 10. Various curriculum areas are covered: science, pre-math, math, drama and music, creative art, sensory, gross and fine motor, social studies and language arts. Basic skills and concepts, resource materials and teaching methods (developmental) are explored for each curriculum area. There is a strong emphasis on individualizing curriculum using the child’s interests, modality of learning and intelligence theories. Group 2 course.
CD 206   Infant/Toddler Development .................. 3.0 (3)
Recommended prerequisite(s): CD 101
This class provides an in-depth study of the physical, cognitive, social and emotional development of the infant and toddler. Students will learn how to use best practice methods with infants and toddlers. There will be a focus on attachment and bonding and how that relates to brain development and later social and academic development. Pregnancy and its influence on early relations will be explored. Students will learn how to build foundation relationships that are trust based. They will also develop skills to build a respectful and responsive environment for children and their families. Group 2 course.

CD 220   Childhood Program Management............ 3.0 (3)
Recommended prerequisite(s): CD 101
This course provides information and experiences to gain knowledge in program administration for establishing policies, implementing and evaluating programs, assessing, recording and reporting children's progress, scheduling activities, promoting good support systems between home and school. In addition, focus will be aimed at understanding administrative organization, leading and managing personnel, financing and budgeting and contributing to the profession. Course instruction is based on the quality principles/standards required by Child Development Associate Certification and the National Association of the Education of the Young Child (NAEYC). Group 2 course.

CD 230   Early Language and Literacy ............... 3.0 (3)
Recommended prerequisite(s): CD 101
This course is designed to teach students how to recognize and implement appropriate environmental strategies that support early literacy development and appropriate early experiences with books and writing. Emphasis is placed on speaking and listening, as well as reading and writing readiness. This group of skills includes expressive and receptive language, concepts of print and appreciation of literature, emergent writing, letter knowledge, and phonological awareness. Upon completion of the course, students will be able to select, plan, implement, and evaluate appropriate early literacy experiences. Group 2 course.

CD 290 (A, B or C)
Academic Service Learning/Internship .......... 1.0 - 4.0 (1-4)
Recommended prerequisite(s): CD 101
Placement in a daycare, nursery school, early elementary grades in grade school or other agencies that deal with students, children and/or families. The student will have the opportunity to interact with individuals and assist with planning for curriculum or program activities under direct supervision. These credits can be divided over more than one semester. Group 2 course.

CHM 101   Introductory Chemistry ...................... 4.0 (3)

CHM 101L Introductory Chemistry Lab ............ 0.0 (2)
Required prerequisite(s): MTH 111
Corequisite(s): CHM 101 and CHM 101L
Recommended prerequisite(s): Students scoring below ENG 111 levels on the COMPASS placement test should plan on additional study time. ENG 111 is strongly encouraged for online students.
A one-semester chemistry course for the non-science major exploring the language, concepts and methods of chemistry. Topics include atomic theory, chemical periodicity, chemical bonding, stoichiometry, gases, nuclear energy, and acid/base chemistry. The laboratory will include descriptive and analytical experiments, focusing on measurement, physical and chemical properties of materials, acids and bases, laboratory procedures and calculations. Science, engineering, and premedical students must select CHM 150 and 151 to meet chemistry requirements. Consult with an advisor before enrolling. Group 1 lab course.

CHM 150   General Chemistry I ....................... 4.0 (3)

CHM 150L General Chemistry I Lab .............. 0.0 (2)
CHM 150R General Chemistry I, Recitation .... 1.0 (2)
Required prerequisite(s): MTH 111
Corequisite(s): CHM 150, CHM 150L, CHM 150R
Recommended prerequisite(s): MTH 121
First semester of a two-semester course covering matter and chemical measurement, basic laws, chemical symbols and formulas, stoichiometry and chemical calculations, gases and the gas laws, thermochemistry, atomic structure, electron configurations and the periodic table, elements, chemical bonding and molecular structure, liquids, solids, and intermolecular forces. The laboratory includes descriptive and quantitative experiments illustrating the above topics. The recitation includes problem solving, quizzes and laboratory preparation to accompany lectures. Group 1 lab course.

CHM 151   General Chemistry II ...................... 4.0 (3)

CHM 151L General Chemistry II Lab .......... 0.0 (2)
CHM 151R General Chemistry II Recitation .... 1.0 (2)
Required prerequisite(s): CHM 150
Corequisite(s): CHM 151, CHM 151L and CHM 151R
A second semester course covering chemical reactions in aqueous solution including acid-base and oxidation and reduction reactions, properties of solutions, chemical kinetics, gaseous equilibria, acids and bases, acid-base equilibria, pH, common ion effect, buffer systems, solubility product constant, thermodynamics, enthalpy, entropy and free energy, electrochemistry, and nuclear chemistry. The laboratory will cover the above topics using quantitative and qualitative procedures. The recitation includes problem solving, quizzes, and laboratory preparation to accompany lectures. Group 1 lab course.
CHM 250 Organic Chemistry I .......................... 5.0 (5)
CHM 250L Organic Chemistry I Lab ..................... 0.0 (4)

Required prerequisite(s): CHM 151
Corequisite(s): CHM 250, CHM 250L

The first semester of a two-semester course covering the chemistry of carbon compounds. Designed to meet the requirements for majors in chemistry, chemical engineering, biological science, pre-medicine, etc. Topics include nomenclature, structure, aliphatic compounds, free-radical, nucleophilic substitution and elimination reactions, electrophilic addition reaction and mechanisms, alkyl halides, alkenes, alkynes and alcohols. The laboratory portion will cover fundamental organic laboratory techniques of synthesis, separation and analysis. Group 1 lab course.

CHM 251 Organic Chemistry II .......................... 5.0 (5)
CHM 251L Organic Chemistry II Lab ..................... 0.0 (4)

Required prerequisite(s): CHM 250
Corequisite(s): CHM 251 and CHM 251L

A follow-up to CHM 250. Topics include alcohols, aromatics, ethers and epoxides, arenes, carbonyls, carboxylic and sulfonic acids and their derivatives, amines, phenols, aryl halides, carbohydrates, amino acids, biochemical processes and others, together with appropriate mechanistic theories and structural concepts. Instrumental techniques discussed include infrared spectroscopy (IR), nuclear magnetic resonance (NMR), mass spectrometry (MS), and ultraviolet (UV) spectroscopy. The lab exercises will continue the development of organic chemistry laboratory technique on both semi-microscale and microscale. In addition, analytical techniques using infrared spectroscopy and gas chromatography will be developed. Group 1 lab course.

Visit www.nmc.edu/science-math for detailed information.

CIT 100 Computers in Business-An Intro ........... 3.0 (3)

Recommended prerequisite(s): Keyboarding skills; CIT 122A or equivalent experience

A first exposure to the world of computer applications in business, this course covers the hands-on use of word processing, spreadsheets, databases, and presentation graphics programs. In addition, the Windows operating system, file and folder management, basic concepts, terminology and security threats will be covered. This course requires MS Office 2013 on a Windows computer (or on a Mac with a Windows partition). A 180-day version of MS Office is included in the book bundle when purchased through the NMC bookstore. The software is also available at campus computer labs. Group 2 course.

CIT 110 Programming Logic and Design .......... 3.0 (3)

Required prerequisite(s): MTH 111, may be taken concurrently
Recommended prerequisite(s): CIT 122A

This course will prepare the student for programming courses. Topics covered include flow charting, pseudocode, object orientation, decisions, repetition, data, and structured programming. Lecture topics will be reinforced with hands-on coding, testing, debugging, and documentation using the C# programming language. Group 2 course.

CIT 118 Microsoft Office - Word Intro ............ 1.0 (1)

Recommended prerequisite(s): CIT 122A
Recommended competency: Basic keyboarding and Windows skills

This course is designed to provide students with an introduction to word processing using Microsoft Word. Skills students will learn include preparing documents, formatting characters and paragraphs, customizing paragraphs, and formatting pages. This course requires MS Office 2013 on a Windows computer (or on a Mac with a Windows partition). A 180-day version of MS Office is included in the book bundle when purchased through the NMC bookstore. The software is also available at campus computer labs. Group 2 course.

CIT 119 Microsoft Office - Word ................... 3.0 (3)

Required prerequisite(s): Keyboarding skills required
Recommended prerequisite(s): CIT 122A

This course teaches students how to use Microsoft Word and prepares them to pass the Microsoft Office Specialist (MOS) Word certification exam. Skills students will learn include navigating in a document, customizing and formatting text, paragraphs and pages, inserting objects, maintaining and proofing documents, performing mail merge operations, document sharing and management, tracking and referencing documents, and managing macros and forms. Students enrolling in this course will take the Microsoft Office Certification exam. This course requires MS Office 2013 on a Windows computer (or on a Mac with a Windows partition). A 180-day version of MS Office is included in the book bundle when purchased through the NMC bookstore. The software is also available at campus computer labs. Group 2 course.
CIT 122A  Computer and Internet Basics I........... 1.0 (1)
Students will learn the essential skills required to use a computer with the Microsoft Windows operating system. The student will learn to interact with the Windows desktop to access software and data. The course emphasizes the importance of file and folder management. The course also includes introduction to the World Wide Web, e-mail and searching. Students completing this course will master skills required for online courses. Group 2 course.

CIT 124  Microsoft Office - PowerPoint ............ 2.0 (2)
Recommended Competency: Basic keyboarding, Windows skills
This course teaches students how to use Microsoft PowerPoint and prepares them to pass the Microsoft Office Specialist (MOS) PowerPoint certification exam. Skills students will learn include preparing and modifying a presentation, using help, formatting slides and inserting elements in slides, creating tables, charts and SmartArt graphics, using slide masters and action buttons, applying custom animation and setting up shows, and integrating, reviewing, protecting and saving presentations. Students enrolling in this course will take the Microsoft Office Certification exam. This course requires MS Office 2013 on a Windows computer (or on a Mac with a Windows partition). A 180-day version of MS Office is included in the book bundle when purchased through the NMC bookstore. The software is also available at campus computer labs. Group 2 course.

CIT 156  CompTIA A+® Certification I ............. 3.0 (4)
This course, in conjunction with CIT 157, covers the current objectives of the two CompTIA A+ Certification exams. Major topic areas include PC hardware, networking, laptops, printers, operational procedures, operating systems, security, mobile devices, troubleshooting, safety and professionalism. Group 2 course.

CIT 157  CompTIA A+® Certification II ............ 3.0 (4)
Recommended prerequisite(s): CIT 156
This course, in conjunction with CIT 156, covers the current objectives of the two CompTIA A+ Certification exams. Major topic areas include PC hardware, networking, laptops, printers, operational procedures, operating systems, security, mobile devices, troubleshooting, safety and professionalism. Group 2 course.

CIT 160  Cisco Internetworking I .................... 4.0 (4)
Recommended prerequisite(s): CIT 213
This course, in conjunction with CIT 161, CIT 260 and CIT 261, prepares the student for the Cisco CCNA Exam (Cisco Certified Network Associate). The architecture, structure, functions, components, and models of the Internet and computer networks are introduced, as well as, the principles of IP addressing and fundamentals of Ethernet concepts, media, and operations. Students will build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes. This course utilizes the Cisco Networking Academy “CCNA Routing & Switching: Introduction to Networks” curriculum and integrates online curriculum, classroom activities and hands-on lab exercises. Group 2 course.

CIT 161  Cisco Internetworking II .................... 4.0 (4)
Required prerequisite(s): CIT 160, may be taken concurrently
This course, in conjunction with CIT 160, CIT 260 and CIT 261, prepares the student for the Cisco CCNA Exam (Cisco Certified Network Associate). The architecture, components, and operations of routers and switches in a small network are described. Students learn how to configure a router and a switch for basic functionality. Students will configure and troubleshoot routers and switches and resolve common issues with RIPv1, RIPv2, single and multi-area OSPF, VLANs, and inter-VLAN routing in both IPv4 and IPv6 networks. This course utilizes the Cisco Networking Academy “CCNA Routing & Switching: Routing and Switching Essentials” curriculum and integrates online curriculum, classroom activities and hands-on lab exercises. Group 2 course.

CIT 170  Microsoft Office - Access ................. 3.0 (3)
Recommended prerequisite(s): CIT 100 or CIT 210; Students should be competent in the Moodle learning environment and have a working knowledge of file/folder storage and management within the Windows environment.
Students in this course will design, construct, manage, and administer databases using Microsoft Office Access. Students will create and modify database objects including tables, queries, forms and reports. Students will enter, delete, modify, import, and export data. Students will configure database features such as security and backup and will evaluate data integrity and design quality. Course content is mapped to the current Microsoft Office Specialist (MOS) Access learning objectives and students enrolled in this course will take the certification exam. This course requires MS Office 2013 on a Windows computer (or on a Mac with a Windows partition). A 180-day version of MS Office is included in the book bundle when purchased through the NMC bookstore. The software is also available at campus computer labs. Group 2 course.

CIT 178  Relational Databases ....................... 3.0 (3)
Recommended prerequisite(s): Basic computer skills with the ability to manage file and folder structures
This course introduces students to core database concepts including data, data types, and relationships. Students will interpret and create relational data structures and use SQL language to perform basic create, read, update, and delete operations. Students will recognize the value of optimized data and produce normalized designs. Group 2 course.

CIT 180  HTML and CSS Programming ............... 3.0 (3)
Recommended prerequisite(s): Placement into ENG 111/111 and MTH 111; Students should be competent in the Moodle learning environment and have a working knowledge of file/folder storage and management within the Windows environment.
Students in this course will develop skills in HTML5 web development with a focus on CSS3 styling techniques. An emphasis is placed on developing solid coding practices that will generate robust, effective and esthetic websites as well as providing for ADA compliance requirements and W3C HTML and CSS validation. Students will develop three web projects during the course. A brief introduction to JavaScript and other web related extended topics are included. Group 2 course.
For course availability, refer to www.nmc.edu/class-search

CIT 188  Data Sources ................................. 3.0 (3)
Required prerequisite(s): CIT 110, CIT 178
This course continues with relational data concepts introduced in CIT 178 with a focus on administration, back up, and security. The course then extends to other data sources and connection technologies. Students will be able to identify and evaluate data options and access data via code. Group 2 course.

CIT 190  JavaScript Programming ................. 3.0 (3)
Required prerequisite(s): CIT 110 and CIT 180
Recommended competencies: Windows file management skills; HTML and CSS coding skills
Students in this course develop web client scripting skills using JavaScript and jQuery. Students use variables, decisions, loops, functions, objects, and other programming concepts as they add robust and powerful interactivity to web pages. Students create web solutions integrating HTML, CSS, JavaScript, jQuery, JSON, and Ajax technologies. Group 2 course.

CIT 195  .NET Application Programming ........... 3.0 (3)
Required prerequisite(s): CIT 110
The student is introduced to .NET application development. Students use Visual Studio to develop Microsoft Windows applications. Application features will include basic input and output, variables, arrays, graphics, menus, and integration with databases. Object-oriented concepts, application design, structured programming, and proper documentation are also covered. Group 2 course.

CIT 208 Mobile Apps-Responsive Design .......... 3.0 (3)
Required prerequisite(s): CIT 190
Recommended prerequisite(s): CIT 195
This course will provide an in-depth look into responsive web design with HTML5. Students will focus on a semester long development effort to create truly engaging websites for both mobile and desktop clients. Students will garner a better understanding of the inner workings of HTML5 while deriving a sense of what it means to develop for a larger device ecosystem. Group 2 course.

CIT 210  Microsoft Office - Excel ................. 3.0 (3)
Recommended prerequisite(s): BUS 105, CIT 122A, MTH 23
This course deals with a comprehensive study of Microsoft Office Excel spreadsheet software, and the business applications which can be created and used with the software. The entry of data with different formats, formula creations, file transfer of data, database management, graphing, data tables, solver programs, and an introduction to macros will be covered. Course content is mapped to the current Microsoft Office Specialist (MOS) Excel learning objectives and students enrolled in this course will take the certification exam. This course requires MS Office 2013 on a Windows computer (or on a Mac with a Windows partition). A 180-day version of MS Office is included in the book bundle when purchased through the NMC bookstore. The software is also available at campus computer labs. Group 2 course.

CIT 213  Networking Technologies .................. 4.0 (4)
Recommended prerequisite(s): CIT 156, CIT 157, may be taken concurrently
This course covers terminology, topologies and media necessary for LANs and WANs. The OSI model will be studied and identified to better enhance the understanding of how various parts work together. Included is an in-depth study of TCP/IP and the characteristics for maintaining a network and ensuring its security. This course maps to the CompTIA Network certification exam objectives. Group 2 course.

CIT 215  Windows Server Environment ............. 3.0 (3)
Required prerequisite(s): CIT 213
In this course students will learn about the latest Windows Server operating system. Students will learn and install many server roles and features. Concepts studied include Windows Installation, Active Directory Domain Services, DNS, DHCP, PowerShell and Group Policy. Students will have an opportunity to work with a Server Core Installation and virtualization using Hyper-V. Account management will be studied and students will set up users and groups, and configure access control lists. The course maps to the Microsoft 70-410 installing and configuring Windows Server 2012 R2 certification exam. Group 2 course.

CIT 216  Computerized Acctg. Systems .......... 2.0 (2)
Recommended prerequisite(s): ACC 121
This course is designed to give the student experience with setting up an accounting system on the computer. QuickBooks software will be used. Accounts receivable, accounts payable, general ledger, inventory and payroll will be covered. Group 2 course.

CIT 218  Web APP Programming ASP .NET .......... 3.0 (3)
Required prerequisite(s): CIT 208, CIT 248 or CIT 188, CIT 255
In this course students will develop multi-tier web applications using dynamic web pages and the ASP.NET framework. The architecture of the web application will be based on the MVC pattern with students writing client-side and server-side code to create a functional, consistent, and robust web application. As a capstone project, the students will develop and deploy a functional web application. Group 2 course.

CIT 223  Project Management ....................... 3.0 (3)
Recommended competency: Basic Windows skills
This course is intended for CIT students and business professionals who need to manage project activities or resources on time, on budget, and according to performance standards. Students use Microsoft Project as a project management tool to schedule tasks, and monitor resources, costs, and project progress. Group 2 course.
CIT 240  Network Security Management .......... 3.0 (3)  
Required prerequisite(s): CIT 213
This course examines the fundamentals of computer network security and explores current practices for securing network resources. Course content is mapped to the CompTIA Security+ certification exam objectives, which include network security, compliance and operational security, threats and vulnerabilities, application, data and host security, access control and identity management, and cryptography. Group 2 course.

CIT 242  Windows Client Administration .......... 2.0 (2)  
Recommended competency: Basic Windows skills
In this course students will study the Windows desktop operating system. Course topics include: installing Windows; implementing and conducting administration of resources; implementing, managing, monitoring, and troubleshooting hardware devices and drivers; configuring and troubleshooting the desktop environment; implementing, managing, and troubleshooting network protocols and services. Group 2 course.

CIT 246  Windows Server Infrastructure .......... 3.0 (3)  
Required prerequisite(s): CIT 215
Students taking this course will learn how to set up, configure, and maintain a Windows Server Infrastructure. Topics covered include operating system deployment, maintenance and administering, troubleshooting DHCP, DNS, Network Access Protection, IPSec, and Virtual Private Networks. System performance and reliability will also be studied. Group 2 course.

CIT 247  Enterprise Solutions ...................... 3.0 (3)  
Required prerequisite(s): CIT 246
This course is the capstone course for the CIT Infrastructure associates degree program. In this course students will gain practical experience building enterprise solutions using a team based approach. These solutions will include high-availability, failover clustering, shared storage, virtualization, business continuity, disaster recovery, and cloud computing. Students will apply their knowledge of networking, security, and Windows Active directory in the design and implementation of these projects. Group 2 course.

CIT 248  SQL Server Databases .................... 3.0 (3)  
Required prerequisite(s): CIT 170
Microsoft SQL Server is used in this course to introduce students to enterprise database analysis and administration tasks. Students focus on performance, scalability, reliability, and security as they normalize database designs, enforce data integrity, create indexes, stored procedures, functions and triggers, optimize queries, and control database access. Group 2 course.

CIT 255  .NET Object-Oriented Programming .... 3.0 (3)  
Required prerequisite(s): CIT 170 or CIT 178, CIT 195
The student builds on .NET programming fundamentals learned in CIT 195, focusing on object-oriented concepts throughout the course. The definition and use of classes with multiple properties, methods, and constructors is covered early. The student implements encapsulation, inheritance and polymorphism while creating several applications in Visual Studio .NET. Group 2 course.

CIT 256  Linux Administration ...................... 3.0 (3)  
Required prerequisite(s): CIT 213
This is a hands-on class that covers the concepts related to Linux installation and system administration. Students will install and administer a Linux operating system. It is intended for students who plan to work at Linux system administrators. It is also intended for those who plan to take one or more certification tests as part of their professional preparation. Group 2 course.

CIT 260  Cisco Internetworking III ................. 4.0 (4)  
Required prerequisite(s): CIT 161
This course, in conjunction with CIT 160, CIT 161 and CIT 261, prepares the student for the Cisco CCNA Exam (Cisco Certified Network Associate), describes the architecture, components, and the operations of router and switches in a large and complex network. Students learn how to configure routers and switches for advanced functionality. Students will configure and troubleshoot routers and switches and resolve common issues with OSPF, EIGRP, STP, and VTP in both IPv4 and IPv6 networks. Students will also develop the knowledge and skills needed to implement DHCP and DNS operations in a network. This course utilizes the Cisco Networking Academy “CCNA Routing and Switching: Scaling Networks” curriculum and integrates online curriculum, classroom activities and hands-on lab exercises. Group 2 course.

CIT 261  Cisco Internetworking IV ................. 4.0 (4)  
Required prerequisite(s): CIT 260, may be taken concurrently
This course, in conjunction with CIT 160, CIT 161 and CIT 260, prepares the student for the Cisco CCNA Exam (Cisco Certified Network Associate), describes the WAN technologies and network services required by converged applications in a complex network. The course enables students to understand the selection criteria of network devices and WAN technologies to meet network requirements. Students learn how to configure and troubleshoot network devices and resolve common issues with data link protocols. Students also develop the knowledge and skills needed to implement IPSec and virtual private network (VPN) operations in a complex network. This course utilizes the Cisco Networking Academy “CCNA Routing and Switching: Connecting Networks” curriculum and integrates online curriculum, classroom activities, and hands-on exercises. Group 2 course.

CIT 275  .NET Solutions Development .......... 3.0 (3)  
Required prerequisite(s): CIT 248, CIT 255
Students will create various types of computer application solutions based on the .NET framework, incorporating content from prior programming and database courses. Data access strategies are examined. Standard industry patterns and practices are emphasized. Software projects are used to demonstrate the software development life cycle. Group 2 course.
CIT 280  Systems Analysis and Design........... 3.0 (3)
Required prerequisite(s): CIT 233, CIT 248, CIT 255
Recommended prerequisite(s): CIT 215
This course is the capstone course in the CIT developer associates degree program. It introduces students to the phases of the systems development lifecycle. Students will gain practical knowledge in systems analysis through participation in a team-based software project. Students will conduct a feasibility study, perform requirements analysis, and model objects and data, communicating effectively throughout the project. Students will apply their knowledge of database design and programming, and they will create a user interface using elements of traditional and modern systems analysis methodologies. Students will utilize project management software to iterate through the software development lifecycle. Group 2 course.

CIT 290  CIT Internship.............................. 3.0 (3)
Required prerequisite(s): 20 credits with a minimum of 3.0 GPA in CIT courses and instructor permission
Work experience is an integral part of the CIT student’s program. In this course, students are placed in settings that utilize their business and CIT skills. Students will work 150 hours during the semester in a paid or non-paid, supervised on-the-job training experience. Students must meet with their academic advisor and submit a resume for review before they will be allowed to enroll in this course. Group 2 course.

CIT 291  Web Developer Internship............... 3.0 (3)
Required prerequisite(s): Instructor permission
Work experience is an integral part of the Web Developer program. In this course, students are placed in settings that utilize their web installation and development skills as well as business and CIT skills. Students will work 150 hours during the semester in a paid or non-paid, supervised on-the-job training experience. Students must meet with their academic advisor and submit a resume for review before enrolling. Group 2 course.

CIT 292  Support Specialist Internship........... 3.0 (3)
Required prerequisite(s): 27-30 hours in the Administrative Support Specialist certificate and instructor permission
Work experience is an integral part of the Support Specialist Certificate program. Students are placed in settings that utilize their technical, business applications, and interpersonal communication skills. Students will work 150 hours during the semester in a paid or non-paid, supervised on-the-job training experience. Students must meet with their academic advisor and submit a resume for review before enrolling. Group 2 course.

CJ 101  Intro to Criminal Justice............... 4.0 (4)
An introduction to the criminal justice system and the criminal justice process, including history, present structure, current functions and contemporary problems of police, prosecution, courts, corrections, and security agencies. Group 2 course.

CJ 102  Police Administration..................... 3.0 (3)
Recommended prerequisite(s): CJ 101
This course will present an overview of public administration with the emphasis on the vitality and capacity to pragmatic change within our American police system. This understanding will be brought about by the comprehensive and analytical study of the structures, processes, and behavior of the typical police infrastructure in the United States. Group 2 course.

CJ 211  Criminal Law............................... 3.0 (3)
Recommended prerequisite(s): Placement into ENG 111
This offering will study Constitutional law and the Bill of Rights as they directly relate to the powers and the limitations of both federal and state law enforcement officers. Current judicial case histories are studied so as to better understand the changes in enforcement policies. The judicial process is reviewed from time of arrest, arraignment, pre-trial, and trial procedure to the final determination of the case. This course is offered spring semester. Group 2 course.

CJ 221  Juvenile Delinquency...................... 3.0 (3)
Recommended prerequisite(s): ENG 11/111 placement, SOC 101
This course is a study of juvenile delinquency theories of causation and current prevention programs. It will explore the nature and extent of delinquency and examine suspected causes of delinquent behavior. It will also cover critical issues in juvenile delinquency and examine crucial policies and programs in the criminal justice system that address juvenile delinquency. It will also include issues facing juvenile probation officers and it will look at the role of police agencies and their relationship to juvenile courts. Group 2 course.

CJ 231  Survey of Corrections..................... 3.0 (3)
Recommended prerequisite(s): Placement into ENG 111
This course will examine the historical and philosophical development of corrections in the United States. Special consideration is given to the theoretical approaches to changing and controlling criminal behavior. Practical limitations and justification to probation, parole, and the operational functions of institutional supervision are also studied. Group 2 course.

CJ 241  Interview & Interrogation............... 3.0 (3)
Recommended prerequisite(s): CJ 101, placement into ENG 111
This course will present techniques and methods of obtaining information from victims, witnesses and suspects. It also deals with the laws and court precedents relative to confessions, statements, and admissibility. Group 2 course.

CJ 242  Evidence & Criminal Procedures......... 3.0 (3)
Recommended prerequisite(s): Placement into ENG 111
An overview of the criminal court system and the process of a criminal proceeding from incident to disposition and appeal, including the rules of evidence affecting the trial of a criminal case. It also includes an overview of the criminal procedure rules concerning arrest, search and seizure, and interrogation and confession, which regulate law enforcement and protect citizens’ rights of privacy and presumed innocence. The course includes pertinent Supreme Court decision. Group 2 course.
CMT Construction Management

CMT 103 Construction Safety ..................... 1.0 (1)
Through structured classroom activity, students will learn the role of OSHA in job site safety, demonstrate hazard recognition and risk assessment techniques, demonstrate an understanding of assured equipment grounding conductor programs and the use of GFCIs, understand proper rigging safety procedures and demonstrate use of hand signals. Group 2 course.

CMT 107 Construction Supervision ............ 4.0 (4)
Students will learn the skills needed for construction management including: business management, estimating and job costing, design and building science, contracts, liability and risk management, marketing and sales, project management and scheduling, the Michigan Residential Code, MIOSHA construction safety standards, and effective communication for construction project management. Group 2 course.

CMT 207 Construction Cost Estimating .......... 3.0 (3)
Required prerequisite(s): CAR 103, CMT 107, MTH 111 or higher Recommended prerequisite(s): ENG 111, may be taken concurrently
In this course students will explore topics pertaining to the processes of construction estimating and bidding techniques. Those topics will include, but are not limited to, the discussion and exploration of the identification and quantification of construction materials, labor, and equipment for the construction bidding process. Some computer estimation programs and/or cost data publications will be used to develop estimates. Group 2 course.

CMT 290 Construction Mgmt. Internship ........ 3.0 (3)
Required prerequisite(s): 30 credits of program specific courses with a GPA of 2.0 or higher
The purpose of the internship is to provide on-the-job training for the student who wishes to pursue a career in a technical field of study. The internship will be customized to meet the learning needs of the student and the job requirements of the sponsoring firm. Students spend 10 hours per week in the paid, supervised on-the-job training experience. In addition to the required 150 hours in a work site, students participate in semi-monthly seminars. Students must apply one month prior to the semester in which they will complete the internship. Group 2 course.

COM Communications

COM 101 Introduction to Communication ........ 4.0 (4)
Designed to introduce the student to the basic components of the communication process, this course emphasizes interpersonal communication, perception, meaning, theory and an introduction to mass communication. The direct application of theories to the student’s individual career choice or personal life experience is stressed. Group 2 course.

COM 111 Public Speaking ............................ 4.0 (4)
Designed to acquaint students with the fundamentals of the discipline and to give them confidence in speech situations, this course considers voice, platform technique, message organization and audience analysis. Emphasis is upon the formal speaking situation. Group 2 course.

COM 121 Broadcasting Practicum I ............ 2.0 (2)
Recommended prerequisite(s): College level reading and writing skills
Practical experience in underwriting, announcing, script writing, "on-air" studio operations and the management of the non-profit college radio station are all part of this course. Internships with local radio stations may be arranged. Group 2 course.

COM 122 Broadcasting Practicum II ........... 2.0 (2)
Recommended prerequisite(s): College level reading and writing skills
This course continues practical experience in underwriting, announcing, script writing, "on-air" studio operations and management. Internships with local radio stations may be arranged. Group 2 course.

COM 150 Global Information Strategies ........ 1.0 (1)
Required prerequisite(s): ENG 111 or permission of instructor
Recommended prerequisite(s): Ability to use computers and familiarity with basic computer software, including Microsoft Word, Excel, and Internet browsers. Basic reading and writing skills; COMPASS score of 70-Writing and 60-Reading.
In this course students will explore the role of information in contemporary society and discover its implications and uses in the global workplace. Students will discover how to identify information sources and learn advanced online research strategies for locating, retrieving and evaluating these sources using current technologies. Group 2 course.

COM 201 Mass Communication & Culture ........ 4.0 (4)
This course is designed to introduce the student to various perspectives on the analysis, evaluation and understanding of mediated communication in mass culture. The course is divided into two major parts. The first focuses on industrial-age theories of mass communication and culture. The second part is designed to give the student the necessary tools to make information-age adaptations to the explanatory/predictive models of the effects of the mass communications and culture. The direct application of theories, critical thinking and analysis of communications having relevance to the student’s individual career choice of life experience is stressed. Group 2 course.
CUL Culinary Arts

CUL 100 Intro to Professional Cookery ............. 1.0 (2)
Recommended competencies: COMPASS scores: Pre-Algebra, 21; Writing, 70; Reading, 82
Note: Course is required for all culinary students. A waiver for this course may be obtained by documenting attendance at a career technical center with a minimum GPA of 2.5 and/or relevant industry experience. Students must submit appropriate documentation (high school transcript and/or resume) to the department chair at least two weeks prior to the beginning of the semester.
This course is designed for students seeking a career in Culinary Arts. This course will provide a broad orientation to aspiring chefs so that they will better understand what is required to succeed in the industry. Emphasis will be placed on professionalism, safety and sanitation, use of commercial equipment and small wares, basic knife skills, and identification of food products. This course will discuss culinary math, standardized recipes and food science basics. Students will be required to purchase an initial set of uniforms for the course. Students will be furnished with hand tools for skills development. Students must receive an overall GPA of 2.5 to pass the class, as well as pass the final practical with a minimum of 2.5. Group 2 course.

CUL 101 Today’s Hospitality Industry ...............3.0 (3)
Recommended competencies: COMPASS scores: Pre-Algebra, 21; Writing, 70; Reading, 82
This course is designed to provide students with a basic understanding of the nature of the hospitality industry, its unique role in the economies of various regions, and the role of proper management techniques in the successful operation of hospitality properties. Group 2 course.

CUL 110 Safety & Sanitation............................2.0 (2)
This course is designed for students who wish to pursue a career in culinary arts or hotel and restaurant management. With today’s complex safety and health laws, it is essential as well as required by many firms to have an in-depth understanding and certification in safety and sanitation. This course provides the students with both. Students study food service safety, including fire safety. Students will earn an American Red Cross Certificate in adult CPR. Students also learn all aspects of food service sanitation and earn the National Restaurant Association Educational Institute (NRAEI) ServeSafe Certificate. Group 2 course.

CUL 111 Professional Cookery .......................6.0 (12)
Required prerequisite(s): CUL 110, may be taken concurrently
An intensive study of foods and cooking, this course exposes the student to commercial equipment, quality food production, and professional presentation. It provides the chef-training student with the practice and theory involved in the preparation of foods in a commercial operation. Basic cooking terminology, methods and procedures are introduced. The course also includes kitchen safety and sanitation, knife and equipment identification and technique, preparation of stocks, soups and mother sauces, meats, poultry and seafood, and the presentation of a complete meal. Uniforms and knives will need to be purchased through the department for this course. Group 2 course.

CUL 118 Introduction to Baking....................4.0 (8)
This course is designed for students seeking a career in Culinary Arts. In this intensive study of fundamental baking techniques, students will become familiar with baking operation and production. This course covers fundamental pastry and dessert recipes as well as the preparation of yeast dough. Also included are tortes, pies, and other desserts. Group 2 course.

CUL 121 Purchasing and Receiving..................2.0 (2)
An overview of how food is purchased, received, stored and distributed is discussed in this course. Focus is on product identification, availability, seasonality, price, quality, and freshness. The course also includes the purchasing practices and controls that help to assure a correct product specification. Proper forms for ordering, issuing, inventory, and cost controls are used. Group 2 course.

CUL 190 Culinary Internship .......................2.0 (2)
Required prerequisite(s): CUL 110, CUL 111, CUL 118, CUL 213 and Culinary staff approval
An internship is an integral part of a student’s academic program. This work-based experience provides an opportunity for students to transfer their academic preparation into actual work-based learning by acquiring “real world” skills and building ties with the business/professional community. Given the rapidly evolving nature of economic, social, and technological change, a successful transition from school to the workplace is vital. Students spend 20-40 hours per week (300 hours/2 semester credits) in this non-paid or paid supervised training experience. The experience will vary with each specific work assignment. Students are expected to demonstrate technical, personal, and interpersonal skills. A specific training plan is developed for each student in cooperation with the employer and internship coordinator to ensure maximum benefit from this learning experience. Students are expected to work collaboratively with the coordinator and their instructors to secure appropriate internship placements. Group 2 course.

CUL 210 Nutrition for Culinary Arts ...............2.0 (2)
This course is designed for students who wish to pursue a career in culinary arts. Healthy eating is attracting more attention as Americans struggle with the problems of obesity and disease prevention. In this atmosphere it is essential for prospective chefs to be aware of the needs of their customers. This course presents the principles of nutrition within the context of professional food preparation. Various ingredients and their role in good nutrition, spa cuisine, planning healthy menus and alternative eating styles are discussed. Group 2 course.
CUL 211  Menu Planning ................................. 3.0 (3)
Required prerequisite(s): CUL 110, CUL 111
No one will argue that the menu is the soul of a restaurant. This course provides the student with the understanding of the menu as the center of the food outlet, which is important in determining facility and staff needs. Menu theme is the driver for equipment purchases, staffing, location and floor plan. An understanding of this complex item is vital to anyone involved in food service. This course is designed to familiarize the student with all aspects of planning a modern menu – from market research to the physical layout of the document. Various types of menus are covered including A’La Carte, Table d’Hote, Institutional and Special Occasion. Menus will be analyzed for effectiveness and pricing strategies along with the menu planning.  Group 2 course.

CUL 213  World Cuisine ................................. 6.0 (12)
Required prerequisite(s): CUL 110, CUL 111
This course is designed for the student who wishes to be a professional chef. It comprises the study, preparation and presentation of foods and cooking methods from selected countries. These countries have been selected based on their current popularity in restaurants. In this course, students develop a knowledge and basic understanding of ethnic cooking including the cooking styles of Italy, France, Mexico, China, and various other Asian and American regions. In the process of learning these multi-national cuisines, the student develops additional technical skills in the preparation of the different foods.  Group 2 course.

CUL 215  Garde Manger .................................... 4.0 (8)
Required prerequisite(s): CUL 110, CUL 111, CUL 118, CUL 213
This course is designed for students who wish to pursue a career in culinary arts. As America’s sophistication regarding food has increased, it is essential that students training to be chefs be exposed to the most up-to-date cooking and presentation techniques. Students prepare cold foods for display: pates, galantines, terrines and mousse. Decorative garnishes and other functional banquet presentations are covered in this course. Meat and seafood fabrication is also practiced. Projects made will be used and displayed at various functions and events held at the Great Lakes Campus and at other special occasions.  Group 2 course.

CUL 217  Kitchen & Dining Room Management... 3.0 (3)
Recommended prerequisite(s): CUL 101
This course is designed for students who wish to pursue a career in the food service industry. The course focuses on the basic principles of management as applied to kitchen and dining room situations. Topics include management theories and techniques, team building, employee motivation, diversity, leadership, personal development, and effective communication.  Group 2 course.

CUL 218  Advanced Baking ............................... 4.0 (8)
Required prerequisite(s): CUL 110, CUL 118
This course is designed for students seeking a career in Culinary Arts. In this intensive study of advanced baking techniques, students will become familiar with baking operation and production as well as dessert and pastry finishing and plate presentation. This course covers more advanced pastry and dessert recipes as well as the preparation of yeast dough. Pastries, tortes, mousses and creams, desserts and dessert sauces will be served to guests at Lobdell’s, the Great Lakes Culinary Institute’s teaching restaurant.  Group 2 course.

CUL 221  Chocolate and Cake Design .................. 4.0 (8)
Required prerequisite(s): CUL 118
This course is designed for students who wish to pursue a career in pastry arts. It is designed for students that would like to expand their creative talents in areas of chocolate artistry and cake decorating. In this course students will learn through lecture, demonstrations and lab work the characteristics of chocolate, chocolate tempering and modeling, candies, fillings, centerpieces, molds & decorations. The cake decoration portion of the course will cover buttercream recipes, history of cake decorating and tools, preparation of boards, papers, columns, boxes, etc., the art of icing a cake, basic cake covering using combs and spatulas, basic piping skills and the use of decorating tips, border skills, floral piping skills, art of swag and drapery applications, art of writing and coloring on a cake. Course includes how to create and display wedding cakes, icings, fondant, pastillage, and gum paste.  Group 2 course.

CUL 295  Contemporary Service & Cuisine .......12.0 (24)
Recommended competency: Basic keyboarding and computer skills
This course focuses on practical hands-on training. Students rotate through the front-of-the-house and the restaurant kitchen in this intensive semester-long course. Front-of-the-house students learn various styles of table, wine and beverage service. Menu merchandising is stressed throughout the course. Guest relations and timing of service are also emphasized as advanced students serve lunch to guests in Lobdell’s, the Great Lakes Culinary Institute’s teaching restaurant. Heart-of-the-house students learn classical food preparation preparing designated menu items. Other areas covered include recipe construction and costing, the use and care of equipment, the pressure of a la carte preparation and service, and the effective handling and use of supplies.  Group 2 course.
DD Drafting & Design

DD 101 Print Reading and Sketching .................. 3.0 (4)
Students will learn to read engineering drawings of products and tooling used in today’s manufacturing. Basic drawing format and layout are presented using product, tooling assembly, and tooling detail drawings. Students learn methods of three dimensional shape description, dimensioning, and tolerancing. Types of fasteners along with related terminology and manufacturing processes are presented. An overview of common manufacturing processes, material specifications, and welding symbols are presented. Students learn the presentation skills of orthographic projection, isometric and oblique pictorial drawings using straight line and free hand sketches. Group 2 course.

DD 110 Basic Metallurgy................................. 3.0 (3)
This course presents the making and forming of steel and the classification of steel, cast iron and aluminum. Mechanical and physical properties are presented along with hardness and tensile testing labs. Principles of alloying, crystal structure, and the iron-carbon diagram help students understand how annealing, hardening, and tempering processes alter the mechanical properties of steel. Non-ferrous metallurgy is presented with an emphasis on aluminum. Group 2 course.

DD 170 CADD/Computer Modeling .................. 4.0 (5)
Recommended prerequisite(s): MTH 23 or MTH 23A and MTH 23B
This course is a graphic communication course using 3D parametric modeling techniques. Topics include 3D modeling using SolidWorks software in an engineering design environment. Students will also develop 2D drafting skills including proper organization and layout of component drawing views, dimensioning and tolerancing, sectioning and detailing, detail descriptive geometry and rapid prototyping. Group 2 course.

DNC Dance

DNC 101 Beginning Dance: An Exploration .......... 2.0 (4)
This course will introduce the major disciplines of dance: ballet, jazz, and modern. Basic dance skills will be acquired through the practice of exercises, steps, and techniques. This course is designed for those with little or no background in dance. Group 2 course.

DNC 110 Modern Dance I............................... 2.0 (4)
Recommended prerequisite(s): DNC 101 or previous experience
This course is designed to introduce students to the physical training and the creative thought process involved in executing modern dance as an art form. This course will consist of technique, improvisation, and creative problem solving through movement. Modern dance and its relationship to music and the historical development of modern dance will also be explored. Group 2 course.

DNC 111 Modern Dance II............................. 2.0 (4)
Recommended prerequisite(s): DNC 110 or previous experience
This course is designed as an extension of Modern Dance I, and will consist of increasing proficiency in modern dance through extended studies in technique, improvisation, creative problem solving, and performance. Dance history and motif writing in dance will also be explored. Group 2 course.

DNC 120 Choreography and Performance ........... 2.0 (2)
Recommended prerequisite(s): DNC 111
Study choreography by participating in an instructor-led choreographed dance, created through structured improvisation and creative problem-solving techniques. Students will also create and develop their own dances through the exploration of a wide range of approaches to choreography. Performance and its relationship to community and cultural values will also be explored. The culmination of the class work will be a dance performance for the public. Group 2 course.

ECO Economics

ECO 201 Principles of Macroeconomics ............. 3.0 (3)
Required prerequisite(s): MTH 23 or MTH 23A and MTH 23B
Recommended prerequisite(s): Placement into ENG 111. It is recommended that students take ECO 201 before ECO 202
This principles level course provides an in-depth overview and analysis of macroeconomic theory and concepts; and applies them to the contemporary economic issues, problems, and policies in the United States and other economies. Topics include the nature and scope of economics; national income accounting; government revenues, expenditures, and national debt; unemployment, inflation and interest rates; economic growth; and monetary, fiscal and international trade policies. Group 1 course.

ECO 202 Principles of Microeconomics ............. 3.0 (3)
Required prerequisite(s): MTH 23 or MTH 23A and MTH 23B
Recommended prerequisite(s): Placement into ENG 111. It is recommended that students take ECO 201 before ECO 202
This principles level course analyzes microeconomics theory and concepts; and applies them to contemporary economic issues, problems, and policies. Topics include supply and demand analysis, productivity and the firm’s costs of production, price and output determination under various market structures, government interventions in markets, factor allocation and pricing, and international trade. Group 1 course.
EDU  Education

EDU 101  Introduction to Teaching .................................3.0 (3)
Recommended prerequisite(s): Placement into ENG 111
This course serves as an introduction to teaching as a career.
It will provide an overview of student behaviors and effective
teaching practices. It includes strategies for guided observation
and classroom participation in preparation for further study
in the field of education. This course includes 30 hours of
observation in a K-12 classroom. Instructor permission is needed
for non-high school graduates. Group 2 course.

EET  Electronics Technology

EET 102  Intro to Engineering Tech .................................2.0 (2)
Required prerequisite(s): Placement into MTH 08 and ENG 97
Recommended prerequisite(s): Placement into MTH 23 and
ENG 99
This course is designed to give students an overview of engi-
neering technology and the career options this profession pro-
vides. This course highlights the technical specializations with-
in the Engineering Technology degree at NMC. Course topics
also include engineering design methods, project management
principles and practices, team work skills, engineering ethics,
and the role of engineering in global and environmental issues.
Group 2 course.

EET 103  Electrical Studies I .................................3.0 (4)
This course examines the fundamentals of electricity, includ-
ing direct current, resistive circuits, electrical terminology,
units and component symbols, electrical safety, circuit con-
ductors, wire sizes, circuit protection devices. Electrical safety
will be stressed as well as the use of multi-meters and other
test equipment. Group 2 course.

EET 104  Electrical Studies II .................................3.0 (4)
Required prerequisite(s): EET 103
This course is a continuation of the fundamentals of Electrical
Studies, including direct current, alternating current, writing
practices, inductors, capacitors, and transformers. The use
of oscilloscopes and multi-meters and other test equipment.
Group 2 course.

EET 161  Fundamentals of Light & Lasers ..................4.0 (6)
Required prerequisite(s): MTH 111
This course introduces the elements of a laser, operation of a
helium-neon gas laser, laser physics, optical-cavities, properties
of laser light, and a survey of laser systems. Safety procedures
concerning lasers and related equipment are presented in this
course. Group 2 course.

EET 212  Elements of Photonics ..................4.0 (5)
Required prerequisite(s): EET 161
Elements of Photonics builds upon and applies principles
presented in Fundamentals of Light and Lasers. The course
includes modules on Operational Characteristics of Lasers;
Specific Laser Types; Optical Detectors & Human Vision;
Principles of Optical Fiber Communications; Photonics
Devices for Imaging, Storage and Display; and Laser Welding
and Surface Treatment. Group 2 course.

EET 221  Industrial Controls ..................3.0 (4)
Required prerequisite(s): EET 103 or ELE 105
This course studies control circuits, electrical schematics and
line diagrams. Motor circuits utilizing motor starters, con-
tactors, timers and counters are used to demonstrate control
circuitry. Industrial control devices are examined, including
solid-state control devices, electro-mechanical relays, proxim-
ity sensors, photoelectric sensing devices and programmable
logic controllers. Group 2 course.

EET 232  Programmable Logic Controllers ..................3.0 (4)
Required prerequisite(s): EET 221
This course studies programmable logic controllers (PLCs).
Basic models and complete applications are applied to control
inputs and outputs of PLCs. Ladder logic and device wiring
techniques are studied, along with advanced program instruc-
tions such as counters, timers, sequencers and integer moves.
Input/output devices are used to examine PLC program logic
during the control process. Group 2 course.

EET 233  PLC Applications I ..................3.0 (4)
Required prerequisite(s): EET 232
This course is a study of the integration of program styles and
components used in industry. Program structures and instruc-
tions will be used in lab projects to simulate how PLCs are
used to create a variety of useful functions. A mixture of text-
book and component manuals will be used to learn the neces-
sary information to complete these functions. Group 2 course.

EET 234  PLC Applications II ..................3.0 (4)
Required prerequisite(s): EET 233
This course is a continuation of the study of the integration
of program styles and components used in industry. Program
structure and project development will be studied. Installation
of different types of components integrated with PLCs will
also be studied. Group 2 course.

EET 260  System Engineering in Practice ..................3.0 (3)
Required prerequisite(s): EET, 102, EET 103, CIT 110
Recommended prerequisite(s): AVF 141, RAM 120 or WSI 200
This course introduces students to the practice of system de-
design and development. Students apply specific methodologies
for problem-based learning and project management. Technical
content from prior courses is applied to address challenges and
create solutions. Student teams create prototypes and commu-
nicate results with classroom activities, supporting teamwork,
project planning, requirements analysis, design, development,
testing, demonstration, and reporting. Group 2 course.
EGR 101 Introduction to Engineering .............. 1.0 (1)
This course is a general overview of the field of engineering. Emphasis is on curricula, categories of engineering and the role of the engineer. Required for all first-year students in the engineering program. Group 2 course.

EGR 113 Engineering Graphics I ...................... 3.0 (4)
Recommended prerequisite(s): MTH 122 or MTH 140
This course is designed to satisfy the engineering graphics requirement for most engineering majors. Topics covered include the principles of orthographic projection, auxiliary views, sectional views, sketching; relationship of lines, planes and points in space, space vectors, and force systems are discussed from an engineer's point of view. Graphic methods are applied to problem solving and communication of ideas. Two and three dimensional computer graphics are used throughout the course to reinforce the basic concepts. Group 2 course.

EGR 131 Elementary Surveying ..................... 5.0 (2)
EGR 131L Elementary Surveying Lab ................. 0.0 (3)
Corequisite(s): EGR 131 and EGR 131L
Recommended prerequisite(s): MTH 122 or MTH 140
This course is designed to satisfy the elementary surveying requirement for a student studying engineering. In this course the student will learn the theory involved in plane and geometric surveying including both linear and angular measurement, differential leveling, trigonometric leveling, traverse computations, electronic distant measurements, GPS mapping, topographical mapping and the design of horizontal and vertical curves as related to construction surveys. Students are expected to perform lab experiments in which they demonstrate their knowledge of concepts learned in lecture to field settings. Care, adjustment, and use of basic surveying instruments; leveling, tapping, horizontal angle measurements, traverse surveys, use of EDM's, GPS usage, topographic mapping and layout of horizontal curves. Computer software will be used throughout the semester. Group 2 course.

EGR 201 Statics ........................................... 3.0 (3)
Required prerequisite(s): MTH 141
Recommended prerequisite(s): ENG 111
This is the first in a three-course sequence in Engineering Mechanics. This course covers those topics usually included under the study of statics, such as forces acting upon a particle and rigid bodies at rest, analysis of structures, frictional forces, centroids and moments of inertia. It also covers shear moment diagrams, thread analysis, trusses and beams. Vector algebra and first semester calculus is used throughout the course. Group 2 course.

EGR 202 Mechanics of Materials ...................... 3.0 (3)
Required prerequisite(s): EGR 201
This is the second in a three-course sequence in Engineering Mechanics. This course covers those topics included in the study of mechanics of materials. This includes stress and strain of engineering materials, torsion, Hooke's Law, and shear and moment diagrams, combined stresses, beam deflection, columns, pressure vessels, structural connections, and buckling of structures. Vector algebra and differential calculus are used throughout the course. Group 2 course.

EGR 203 Dynamics ....................................... 4.0 (4)
Required prerequisite(s): EGR 201
This is the third in a three-course sequence in Engineering Mechanics. This course includes those topics typically covered in dynamics such as kinematics, kinetics, particle and rigid body motion, work-energy principles, impulse-momentum, Newton's Laws of Motion, and harmonic motion. Vector algebra and differential calculus are used throughout this course. Group 2 course.

Visit www.nmc.edu/science-math for detailed information.
EGY Renewable Energy

EGY 101 Principles of Renewable Energy ........... 3.0 (3)
Recommended prerequisite(s): MTH 23 or placement into MTH 111, ENG 111
This course highlights industry and governmental perspectives on geothermal, wind, solar, biomass, fuel cells, and other energy sources. Group 2 course.

EGY 105 Sustainable Building Design ............ 3.0 (3)
Recommended prerequisite(s): MTH 23 or placement into MTH 111, ENG 111
This course provides an introduction to sustainable building practices and is for those students studying for the Environmental Design (LEED) Accredited Professional (AP) Exam. Through structured learning activities, the student will learn about the structure of matter and the material world, whole system thinking, site and natural energy mapping, water resources, building orientation, materials and resources, indoor air quality, innovation and design. Group 2 course.

EGY 115 Residential Energy Efficiency ............ 3.0 (3)
Recommended prerequisite(s): MTH 23 or placement into MTH 111, ENG 111
Through structured classroom and hands-on skill building, the student will learn about the principles of energy, building shell construction, air leakage, insulation, windows and doors, heating, lighting, cooling, water heating, health, and safety. Group 2 course.

EGY 141 Solar Photovoltaic Tech I ............ 3.0 (3)
Recommended prerequisite(s): ELE 101 or EET 103
Recommended competency: MTH 111 and MTH 121
Through structured lecture and practical skill building, the student will learn about PV applications, solar radiation, site surveys, system components, system sizing, and preparation of a solar installation proposal. Group 2 course.

EGY 143 Solar Thermal Tech I ............ 3.0 (4)
Recommended prerequisite(s): MTH 23 or placement into MTH 111, ENG 111
Through structured classroom and hands-on skill building, the student will learn the history of solar thermal heating systems, components, drainback systems, glycol systems, start up and maintenance procedures, savings and performance estimates, system control, monitoring and testing and solar space heating design. Group 2 course.

EGY 145 Geothermal Technology ............ 3.0 (4)
Recommended prerequisite(s): MTH 23 or placement into MTH 111, ENG 111
This course introduces the basic principles of geothermal energy production and technology. Essentials on how to utilize geothermal technology as an energy source will be analyzed and demonstrated. Examples of residential and commercial applications will be shown and reviewed. Group 2 course.

EGY 151 Solar Photovoltaic Tech II ........ 3.0 (4)
Recommended prerequisite(s): MTH 23 or placement into MTH 111, ENG 111
Through structured classroom and hands-on skill building, the student will learn about inverters, PV system sizing, mechanical integration, electrical integration, utility interconnections, permitting and inspection, commissioning, maintenance, troubleshooting and economic analysis. Group 2 course.

EGY 161 Wind Power Technology ............ 3.0 (3)
Recommended prerequisite(s): MTH 23 or placement into MTH 111, ENG 111
Through structured classroom discussion, the student will learn about wind applications, measuring the wind, estimating power output of various sizes, economics of wind generation, evaluating technology, towers, interconnection with the utility, siting, installation, operation, performance, maintenance, and safety. Group 2 course.

ELE Electrical

ELE 101 Introduction to Electrical ............ 3.0 (4)
Recommended competencies: COMPASS placement into MTH 111 or higher, or co-enrollment in the appropriate developmental math course. COMPASS placement in ENG 11/111 or higher, or co-enrollment in the appropriate developmental English course.
This course provides an introduction to electrical. Through structured classroom and hands-on skill building, the student will learn the orientation to the trade, electrical safety, circuits, theory and an introduction into the National Electrical Code. Group 2 course.

ELE 105 Beg. Residential Electrical ............ 3.0 (4)
Required prerequisite(s): ELE 101
Through structured classroom and hands-on skill building, the student will learn general information for electrical installations in the residential field to include: electrical symbols and outlets, determining the required number of lighting and receptacle outlets, conductor sizing and connections, switch control, bonding/grounding, ground-fault circuit interrupters and similar devices, and begin calculations for wiring various rooms in a common residential building. Group 2 course.

ELE 110 Electrical Code Studies I ............ 3.0 (3)
Recommended prerequisite(s): ELE 105, MTH 111
This preparatory course reflects many of the important changes that appear in the current edition of the National Electrical Code. The changes are presented as they pertain to Single Family Dwellings, Multifamily Dwellings, Commercial Locations, Industrial Locations, and Hazardous Locations. It is designed to enable the student to learn electrical print reading and become familiar with applicable sections of the National Electrical Code. Group 2 course.
ELE 111 Electrical Code Studies II .................. 3.0 (3)
Required prerequisite(s): ELE 110
Recommended prerequisite(s): ELE 105
This course will help the student in learning to read and interpret the meaning of the Code, and to find information about how to do wiring installations. Upon completion of this course, the student will be able to find information from the Code needed to do residential, commercial, farm, and industrial wiring and to be successful with electrical examinations. Group 2 course.

ELE 121 Adv. Residential Electrical ................. 3.0 (4)
Required prerequisite(s): ELE 105
Through structured classroom and hands-on skill building, the student will learn advanced residential wiring techniques including: workshop circuits, special purpose outlets, gas and oil central heating systems, low-voltage wiring, alarms and security systems, service entrance equipment, overcurrent protection, service entrance calculations, swimming pools, home automation systems, and standby power systems. Group 2 course.

ELE 125 Pre-Commercial Electrical ................. 3.0 (4)
Required prerequisite(s): ELE 121
Through structured classroom and hands-on skill building, the student will learn small sources of electricity, basics of alternating current, AC circuits containing inductance, AC circuits containing capacitors, AC circuits containing resistance-inductance-capacitance, three-phase power, transformers, DC machines, and AC machines. Group 2 course.

ELE 131 Commercial Electrical .................... 3.0 (4)
Required prerequisite(s): ELE 105
Through structured classroom and hands-on skill building, the student will learn commercial building plans and specifications, reading electrical drawings, calculating the electrical load, branch circuits, wiring methods, motor and appliance circuits, feeders, special systems, and working drawings. Group 2 course.

ELE 135 Adv. Commercial Electrical ............... 3.0 (4)
Required prerequisite(s): ELE 131
Through structured classroom and hands-on skill building, the student will learn special circuits, panelboards selection and installation, the electric service, lamps and ballasts for lighting, luminaires, emergency, standby and optional standby systems, overcurrent protection, short-circuit calculations, equipment and conductor short-circuit protection, low-voltage remote-control, and the cooling system. Group 2 course.

ELE 142 Industrial Electrical ....................... 3.0 (4)
Required prerequisite(s): ELE 105
Through structured classroom and hands-on skill building, the student will learn plans and sitework, the unit substation, feeder bus system, panelboards, trolley busways, using wire tables, signaling systems, basic motor controls, motors and controllers, and motor installation. Group 2 course.

ELE 146 Adv. Industrial Electrical .................. 3.0 (4)
Required prerequisite(s): ELE 142
Through structured classroom and hands-on skill building, the student will learn power factor, ventilating, air conditioning, and other facilities, system protection, lightning protection, site lighting, programmable logic controllers, developing a program for a PLC, fiber optics, hazardous locations, and harmonics. Group 2 course.

ENG English

ENG 11 English/Writing Methods ................... 2.0 (developmental) (2)
Required prerequisite(s): COMPASS placement (Writing scores of 45 and above with Reading scores of 60-77) and successful completion or co-enrollment in ENG 108; or a minimum 2.0 in ENG 99 and successful completion or co-enrollment in ENG 108
Corequisite(s): ENG 11
This course is to be taken concurrently with ENG 111, and helps facilitate the objectives of ENG 111. Special attention is given to individual student needs in the conventions of standard written prose, argumentation and research. Four of the six credits may be counted toward graduation and toward fulfilling the English Composition requirement for any curriculum or degree.

ENG 12 English/Writing Methods ................... 2.0 (developmental) (2)
Required prerequisite(s): Successful completion of ENG 111 or ENG 11/111, and ENG 108
Corequisite(s): ENG 112
Recommended prerequisite(s): A grade of 2.0 or higher in ENG 111 or transfer equivalent; or grades of 2.0 or higher in both ENG111/11 and ENG 108. This course is highly recommended (but not required) for students who complete their first semester of freshman composition with a 1.0 or 1.5, or for students who simply express a need to work on the ENG 112 curriculum in a smaller class, with more time and individual attention.
This course is to be taken concurrently with ENG 112 and helps facilitate the objectives of ENG 112. Special attention is given to individual student needs in the conventions of standard written prose, argumentation, and research. Four of the six credits may be counted toward graduation and toward fulfilling the English Composition requirement for any curriculum or degree.
**ENG 97**  Fundamentals of Reading and Writing ... 4.0 (developmental) (4)

*Required prerequisite(s): Based on placement testing. See advisor. Corequisite(s): ENG 107*

This course is to be taken concurrently with ENG 107 and will provide an overview to reading, writing and college readiness. The course will provide students with the basic skills required for college success, thereby empowering them to become more responsible and actively engaged in their own education. Students will learn and practice basic reading skills such as annotation, think-aloud, word attack and main idea identification. Students will also be introduced to the writing process and learn a variety of methods such as free writing, invention, essay planning, drafting and revision. In addition, they will learn strategies to assist them in successful college completion by learning the following skills: time management, goal setting, note taking, active learning organization, and motivation.

**ENG 99**  Introduction to College Reading/Writing ... 6.0 (developmental) (6)

*Required prerequisite(s): Successful completion of ENG 97/107 with a 2.0 or better, or placement based on COMPASS scores*

This is an integrated reading and writing course that gives students the literacy skills they need for college-level academic work. It builds on the reading and writing skills students already have and prepares them for college composition and reading intensive courses. It also focuses on grammar, punctuation, sentence construction and variety. ENG 99 will cover a broad range of topics and explore a variety of reading and writing chosen to help students develop critical reading, writing and thinking skills.

**ENG 107**  Academic Study Methods ................. 2.0 (2)

This course is designed to provide students with the strategies necessary to succeed in college. Participants will examine the characteristics of successful students as well as learn strategies for taking greater responsibility for their own learning. Additionally, the course will provide ways of developing greater intrinsic motivation, increased perseverance, and more effective time management skills, as well as help them discover and revise limiting beliefs and self-defeating behaviors. Practical skills will include a variety of note taking and study strategies as well as confident and effective test preparation.

**ENG 108**  Critical Reading Strategies ................. 3.0 (3)

*Required prerequisite(s): COMPASS reading score of 60 (or above), plus a writing score of 45 (or above), or successful completion of ENG 99*

Through a variety of complex readings, students will improve comprehension, vocabulary, critical reading and critical analysis. Reading strategies and skills will include previewing, annotating, finding main ideas and supporting details, effectively using graphic organizers and outlines, and summarizing. Critical analysis will include identifying audience, purpose, tone and bias. Students will also learn to identify claims and types of supports and response effectively to those claims.

**ENG 109**  Grammar & Writing ......................... 3.0 (3)

*Required prerequisite(s): ENG 99*

*Recommended prerequisite: COMPASS Writing 31-69; COMPASS Reading 51-71 or successful completion of ENG 99*

This course is not a refresher but an intensive inspection of the sentence--as it gets used in academic writing. In the eight weeks, students will be invited to think strategically and deliberately about conventions they've either missed or acquired unconsciously. While developing/intensifying syntactical skill, students will also develop a sound and reasonable language about language. Group 2 course.

**ENG 110**  English Composition ....................... 4.0 (4)

*Required prerequisite(s): COMPASS Writing score of 45 or above plus COMPASS Reading score of 78 or above; or ACT Reading score of 19 or above plus ACT English score of 18 or above; or successful completion of ENG 99 and ENG 108*

English 110 is the first semester of a two-semester composition sequence introducing analytical and information literacy skills that lay a foundation for success in all disciplines. ENG 111 also introduces and emphasizes rhetorical knowledge (including audience and purpose), invention, and reading/writing processes. Group 1 course.

**ENG 111**  English Composition ....................... 4.0 (4)

*Required prerequisite(s): ENG 108 and ENG 111/111 or ENG 111*

This is a writing course based on critical reading from various fields. Writing assignments reinforce skills in summary, analysis, evaluation, and synthesis. Emphasis is on argumentation, research methods, and information literacy. Group 1 course.

**ENG 210**  Children’s Literature ....................... 3.0 (3)

*Required prerequisite(s): ENG 112 or ENG 220, either may be taken concurrently*

Focus is on developing criteria, terminology and resources for evaluation and selection of good quality children's literature and on developing methods for sharing that literature with children. This course surveys both picture books and novels from a variety of genres and cultures, and also examines the impact of social change on children’s literature. Humanities or English credit. Group 1 course.

**ENG 211**  Introduction to Linguistics .................. 3.0 (3)

*Required prerequisite(s): ENG 112 or ENG 220, either may be taken concurrently*

This course is designed to acquaint students with modern developments in the science and philosophy of language, and to improve their understanding of the intersection of culture and language in general. It addresses issues of sound, word formation, syntax, semantics, language acquisition, language variation and change, and more. Group 2 course.
ENG 220  Technical Writing ............................. 3.0 (3)
Required prerequisite(s): ENG 111
This course introduces students to a variety of technical writing situations in business, industry, science, and education. It emphasizes audience awareness, research methods, problem solving, critical thinking, professional ethics, and types of formal reports including proposals, analytical reports, progress reports, and technical instructions and descriptions.  
Group 2 course.

ENG 221  Creative Writing ............................. 3.0 (3)
Required prerequisite(s): ENG 112 or permission of instructor
Recommended prerequisite(s): Students should have language skills at least equivalent to ENG 112
Study and practice of the basic techniques of effective imaginative prose: concrete language, conflict, characterization, point of view, narrative arc, pace, and setting. Focus on fiction, but allowance for nonfiction. Employs workshop format to develop reading and feedback skills. Skills developed include close reading, close observation, craft in above-described techniques, revision, discipline and practice, giving and receiving feedback, developing access to imaginative powers. Text is supplemented with additional examples of fiction and nonfiction.  
Group 2 course.

ENG 222  Advanced Creative Writing ............................. 3.0 (3)
Required prerequisite(s): ENG 221 or instructor permission
Recommended prerequisite(s): Students should have language skills at least equivalent to ENG 112
Continued study and practice of basic techniques of effective imaginative prose learned in ENG 221: concrete language, conflict, characterization, point of view, narrative arc, pace, and setting. Focus on fiction, but allowance for nonfiction. Employs workshop format to develop reading and feedback skills. Skills developed include close reading, close observation, craft in above-described techniques, revision, discipline and practice, giving and receiving feedback, developing access to imaginative powers. Explores ways to suggest and shape meaning in fiction.  
Group 2 course.

ENG 223  Apprentice Poetry Workshop ............................. 3.0 (3)
Required prerequisite(s): ENG 112 or permission of instructor
Recommended prerequisite(s): Students should have language skills at least equivalent to ENG 112
Study and practice of basic elements of poetic composition, by reading and writing a variety of forms. Employs workshop format to develop reading and feedback skills. Skills developed include close reading, close observation, craft techniques, revision, discipline and practice, giving and receiving feedback, developing access to imaginative powers. Engages deeply with the books of two poets, and several books by one poet.  
Group 2 course.

ENG 224  Journalism Fundamentals ............................. 3.0 (3)
Required prerequisite(s): Placement into ENG 111
Recommended prerequisite(s): Because the class rests on the assumption that students are comfortable with basic research strategies, academic argumentation, and evaluation of secondary sources, students should have completed ENG 112 with a 2.0 or better.
This course examines the changing face of journalism and media today, providing students with theory and practice in four core areas: interviewing, newswriting, reporting, and research. Students will learn the form and conventions of hard news, opinion/editorial, feature writing and alternative story formats across media platforms: print, on-line blog, radio and video. Students will examine the history of journalism, press law and ethic while exploring the changing roles of journalism and how its processes and products impact readers in our highly digitized contemporary society.  
Group 2 course.

ENG 228  Advanced Writing & Rhetoric ............................. 4.0 (4)
Required prerequisite(s): ENG 112
Recommended prerequisite(s): Students should have language skills at least equivalent to ENG 112
This course examines ancient rhetoric and applies its principles and analytical tools to the language of everyday life. Using terms and concepts from ancient Greek and Roman rhetoricians, students undertake an intensive exploration of language and its persuasive dimensions. Throughout the semester, students discover how a variety of texts (such as news programs, literary works, advertisements, political slogans, college textbooks, course syllabi, and other official documents) persuade audiences to believe in a particular reality. Formal written analyses will rely on a working knowledge of terms and concepts discussed throughout the semester. In essence, this course is theoretical in nature—as it investigates how language works on consciousness and culture.  
Group 2 course.

ENG 240  Introduction to Literature ............................. 3.0 (3)
Required prerequisite(s): ENG 112 or ENG 220, either may be taken concurrently
An introduction to a variety of literary styles, themes, and forms such as fiction, drama, and poetry. Intended to develop an understanding and enjoyment of reading as well as an understanding of current critical approaches to the study of literature. Humanities or English credit.  
Group 1 course.

ENG 241  Mythology ............................. 3.0 (3)
Required prerequisite(s): ENG 112 or ENG 220, either may be taken concurrently
This course features a study of central and recurring patterns of human concern as revealed in the mythic content of various forms of literature. Examination of archetypal structures embedded in works of cultures ranging from ancient Babylonian to contemporary eras is central to course goals and outcomes. Areas to be investigated will include myths of the quest, of power, of origins, of love, and of art. Humanities or English credit.  
Group 1 course.
ENG 242 Women in Literature.........................3.0 (3)
Required prerequisite(s): ENG 112 or ENG 220, either may be taken concurrently
This course features an examination of essays, novels, stories, and poems written primarily (but not exclusively) by 19th and 20th century European and American female authors. In addition, the course introduces students to relevant literary criticism and the historical, cultural context in which writing by and about women has emerged. Humanities or English credit. Group 1 course.

ENG 245 Native American Literature ................3.0 (3)
Required prerequisite(s): ENG 112 or ENG 220, either may be taken concurrently
This is a general introductory survey course that will explore various Native American literary genres, including fiction, nonfiction, biography and critical essays. Students will be encouraged to develop a critical stance toward non-Native depictions of Native literature and to look beneath the "surface" for hidden socio-economic messages in fiction. Students will evaluate past and present expectations of Native American literature and develop an understanding of new, more aggressive forms of fiction and nonfiction that are becoming more commonplace. Humanities or English credit. Group 1 course.

ENG 254 Shakespeare..................................3.0 (3)
Required prerequisite(s): ENG 112 or ENG 220, either may be taken concurrently
This course is an introduction to representative major dramatic works of Shakespeare and the Elizabethan Age, and includes lecture, film, and discussion. Humanities or English credit. Group 1 course.

ENG 256 Environmental Literature...................3.0 (3)
Required prerequisite(s): ENG 112 or ENG 220, either may be taken concurrently
This course will explore the changing perceptions and definitions of wilderness and nature in American literature and culture. Students will read and discuss poetry, fiction, and nonfiction by American authors, including Emerson, Thoreau, Muir, Leopold, Austin, Carson, Stegner, Jeffers, Silko, Oliver, Abbey, Snyder, and Williams. We will also explore the interaction between literature and environmental activism, and consider the impact of nature and wilderness on American art. Group 1 course.

ENG 261 British Literature..............................3.0 (3)
Required prerequisite(s): ENG 112 or ENG 220, either may be taken concurrently
This course features an intensive reading of works from British authors representing the entire span of this literary tradition and including works in various genres. It develops a sense of British literature evolution and a facility in careful literary criticism. Humanities or English credit. Group 1 course.

ENG 262 American Literature..........................3.0 (3)
Required prerequisite(s): ENG 112 or ENG 220, either may be taken concurrently
Students in this course study the American tradition, early and modern, in prose and poetry. Selections will emphasize the cultural and intellectual background giving rise to our national literature, the major phases or movements in that literature, and how certain writers transcended those movements to create work of universal value. Humanities or English credit. Group 1 course.

ENG 263 World Literature..............................3.0 (3)
Required prerequisite(s): ENG 112 or ENG 220, either may be taken concurrently
Recommended prerequisite(s): Completion of ENG 111 and 112 strongly recommended or instructor permission
This course exposes students to a variety of readings drawn from Africa, Asia, Europe, Latin America, and/or Oceania. While the reading and writing assignments will certainly require close literary analysis, the class will also attempt to situate the works culturally, historically, and theoretically. Humanities or English credit. Group 1 course.

ENG 264 Detective Fiction..............................3.0 (3)
Required prerequisite(s): ENG 112 or ENG 220, either may be taken concurrently
The primary emphasis of this course are reading and writing about detective fiction and the historical and cultural development of this genre of literature. Multi-media story formulas analyzed include avenger stories, private eye fiction, police procedurals, gentlemen thieves, psychic detectives, stories of magician detectives and spy fiction. Humanities or English credit. Group 1 course.

ENG 265 Science Fiction & Fantasy....................3.0 (3)
Required prerequisite(s): ENG 112 or ENG 220, either may be taken concurrently
The primary emphasis of this course are reading and writing about Science Fiction and Fantasy stories as they are found in a range of cultural tests like print, motion pictures, radio drama, television, and more. Students will learn to identify and discuss mythologies and related symbols, and genre and formula conventions such as icons, stereotypes, rituals, plots, motifs, settings, and more as they investigate the social history of these stories. Humanities or English credit. Group 1 course.

ENG 266 Popular Culture..............................3.0 (3)
Required prerequisite(s): ENG 112 or ENG 220, either may be taken concurrently
The primary emphasis of this course center on the critical reading of and writing about popular culture and its historical development in U.S. and world cultures. Topics to be addressed include myth and mythmaking, iconography, stereotypes, rituals, genres and formulas, the mass media and more. Humanities or English credit. Group 1 course.
ENG 267  Film as Literature ................................. 3.0 (3)
Required prerequisite(s): ENG 112 or ENG 220, either may be taken concurrently
This course offers students the opportunity to examine and critique a selection of films through discussion and writing by employing techniques similar to those used in literary analysis. Humanities or English credit. Group 1 course.

ENG 271  Adolescence & Cultural Diversity ........ 3.0 (3)
Required prerequisite(s): ENG 112 or ENG 220, either may be taken concurrently
This course provides a study of universal and diverse themes and ideas expressed through adolescent literature. It features protagonists and authors from a variety of cultures, both within and outside of the United States, and emphasizes the relationship between culture and the lives of young people. Humanities or English credit. Group 1 course.

For more information on elective literature or writing courses and when they are offered, please contact the Communications Academic Office, (231) 995-1175.

ENV 103  Environmental Science

ENV 104  Life of the Past ................................. 4.0 (3)
ENV 104L  Life of the Past Lab .......................... 0.0 (2)
Recommended prerequisite(s): MTH 08 and ENG 99 or COMPASS equivalent. Students scoring below ENG 111 levels on the COMPASS placement test should plan on additional study time.
Corequisite(s): ENV 103, ENV 103L
This course introduces students to the record of life on Earth. The roles of global change, origins, evolution, and extinction in life history are examined. Great Lakes and North American fossil records with Pre-Paleozoic micro-organisms and Paleozoic invertebrates and vertebrates are highlighted. Appearance, evolution, and disappearance of dinosaurs during the Mesozoic Era, human evolution, and the recent demise of the giant Ice Age mammals are analyzed in depth. Laboratory and class activities are included. Group 1 lab course.

ENV 103L  Environmental Science Lab .................. 0.0 (2)

ENV 104  Life of the Past ................................. 4.0 (3)
ENV 104L  Life of the Past Lab .......................... 0.0 (2)
Recommended prerequisite(s): MTH 08 and ENG 99 or COMPASS equivalent. Students scoring below ENG 111 levels on the COMPASS placement test should plan on additional study time.
Corequisite(s): ENV 104, ENV 104L
This course explores processes which transform planet Earth. Landforms, minerals, rocks, and geologic structures are examined in classroom, laboratory, and field studies which focus on the geologic processes and the techniques of geology. Lab studies apply the methodology and techniques of geology by introduction of map reading, field and map study, study of surficial processes, and study of minerals and rocks. Group 1 lab course.

ENV 104L  Environmental Science Lab .................. 0.0 (2)

ENV 104  Life of the Past ................................. 4.0 (3)
ENV 104L  Life of the Past Lab .......................... 0.0 (2)
Recommended prerequisite(s): MTH 08 and ENG 99 or COMPASS equivalent. Students scoring below ENG 111 levels on the COMPASS placement test should plan on additional study time.
Corequisite(s): ENV 104, ENV 104L
This course explores processes which transform planet Earth. Landforms, minerals, rocks, and geologic structures are examined in classroom, laboratory, and field studies which focus on the geologic processes and the techniques of geology. Lab studies apply the methodology and techniques of geology by introduction of map reading, field and map study, study of surficial processes, and study of minerals and rocks. Group 1 lab course.

ENV 111  Physical Geology ............................. 4.0 (3)
ENV 111L  Physical Geology Lab ...................... 0.0 (2)
Required prerequisite(s): MTH 23
Corequisite(s): ENV 111, ENV 111L
This course explores processes which transform planet Earth. Landforms, minerals, rocks, and geologic structures are examined in classroom, laboratory, and field studies which focus on these geologic processes and on the techniques of geology. Lab studies apply the methodology and techniques of geology by introduction of map reading, field and map study, study of surficial processes, and study of minerals and rocks. Group 1 lab course.

ENV 112  Historical Geology ........................... 4.0 (3)
ENV 112L  Historical Geology Lab ................... 0.0 (2)
Recommended prerequisite(s): ENV 103 or ENV 111 or GEO 105, MTH 111 and placement into ENG 111
Corequisite(s): ENV 112, ENV 112L
Rocks and fossils of North America, the Great Lakes and the Grand Traverse region which reveal the physical, chemical, and biological evolution of the planet Earth are explored in classroom, laboratory, and field studies (including a required 4-day field excursion to Elliot Lake, Ontario). Group 1 lab course.

ENV 117  Meteorology & Climatology ................ 4.0 (3)
ENV 117L  Meteorology & Climatology Lab ........ 0.0 (2)
Required prerequisite(s): MTH 23
Corequisite(s): ENV 117, ENV 117L
Recommended prerequisite(s): Students scoring below ENG 111 levels on the COMPASS placement test should plan on additional study time.
Designed to acquaint the student with the science and art of weather analysis, this course includes studies of the basic properties of gases, organization and composition of the atmosphere, basic energy flow, and general weather phenomena that result. Global climates are also investigated. The laboratory portion presents the function and effect of selected physical processes, and includes the use of weather instruments and weather maps. Group 1 lab course.

ENV 131  Oceanography ................................. 4.0 (3)
ENV 131L  Oceanography Lab .......................... 0.0 (2)
Required prerequisite(s): MTH 23
Recommended prerequisite(s): Students scoring below ENG 111 levels on the COMPASS placement test should plan on additional study time.
Corequisite(s): ENV 131, ENV 131L
This course explores the origins, structure, and evolution of the ocean basins and their role in global climate dynamics. It shall include an investigation of the physical properties that govern waves, currents, tides, air-sea interactions as well as the physical and chemical properties of seawater. It also explores plant and animal life within the oceans including impacts of human activities on the marine environment. Group 1 lab course.
ENV 140  Watershed Science .......................... 4.0 (3)  
ENV 140L  Watershed Science Lab. ...................... 0.0 (2)  
Recommended prerequisite(s): MTH 111. Students scoring below ENG 111 levels on the placement test should plan on additional study time.  
Corequisite(s): ENV 140, ENV 140L  
This course is designed for the learner who wishes to gain an in-depth understanding of watersheds. It will focus on the physical and biological systems that are responsible for the quality and characteristics of a watershed. Human interactions, stewardship, management and impacts on our local water resources will also be explored. The laboratory portion of the course will place emphasis on field investigations and the analysis of data and water samples collected. Throughout the course basic scientific principles will be incorporated. **Group 1 lab course.**

ENV 210  Fundamentals of Soil Science .............. 4.0 (3)  
ENV 210L  Fundamentals of Soil Science Lab ...... 0.0 (2)  
Recommended prerequisite(s): ENG 111, MTH 23  
Corequisite(s): ENV 210, ENV 210L  
This course will explain the fundamental principles of soil science emphasizing soil as a natural resource. The many interactions between the soil and other components of forest, range, agricultural, wetland and constructed ecosystems are highlighted. In addition to the physical properties; soil chemistry, water interactions, and biological process will be investigated. Soil taxonomy, management, and human interaction with soil will also be covered. The laboratory portion of the course focuses on mapping and identification of soils in the field and lab analysis of soil properties. **Group 1 lab course.**

ENV 270A  Michigan Basin Geology .................... 2.0 (3)  
Recommended prerequisite(s): ENG 111, MTH 23, completion of any Science course with laboratory  
This is a six-day field study of the Michigan Basin. The class focuses on Paleozoic geologic history, fossil record, and economic geology of the Lower Peninsula and eastern Upper Peninsula. The relationships of bedrock layers to recent surficial geologic processes and their associated landforms will also be explored. **Group 1 course.**

ENV 270B  Field Mapping Techniques ................. 2.0 (3)  
Required prerequisite(s): MTH 23, instructor permission required  
Recommended prerequisite(s): ENG 111, completion of any Science course with laboratory  
This course is a one-week field course. It will focus on the fundamentals of map interpretation and generation. Students will gain a basic understanding of the principles of cartography and field mapping techniques employed by various disciplines in the acquisition of spatial data. **Group 1 course.**

ENV 270C  Precambrian Geology of Michigan ...... 2.0 (3)  
Required prerequisite(s): MTH 23, instructor permission required  
Recommended prerequisite(s): ENG 111, MTH 23, completion of any Science course with laboratory  
This course is a six-day field study of the Precambrian geology of the western Upper Peninsula of Michigan. The class will focus on rock and mineral identification, economic geology, and the geologic history of Michigan’s Upper Peninsula. The relationships of ancient bedrock layers to recent surficial geologic processes and their associated landforms will also be explored. **Group 1 course.**

Visit [www.nmc.edu/science-math](http://www.nmc.edu/science-math) for detailed information.

**FRN  World Language - French**

FRN 101  Elementary French I ....................... 4.0 (4)  
Recommended prerequisite(s): You will be required to read, write, listen and speak in French. You will need a minimal ability using technology to take advantage of out-of-class requirements.  
This course represents a comprehensive introduction to the French language for the true beginner. Students will develop the ability to communicate in French in everyday situations while acquiring some of the necessary skills for reading, writing, listening, and speaking. Cultural topics are integrated in each unit. **Group 2 course.**

FRN 102  Elementary French II ..................... 4.0 (4)  
Required prerequisite(s): FRN 101 with 2.0 or higher score on the NMC language placement test or instructor permission  
Recommended prerequisite(s): You will be required to read, write, listen and speak in French. You will need a minimal ability using technology to take advantage of out-of-class requirements.  
FRN 102 is a continuation of FRN 101 and focuses on the expansion of the communication skills of reading, writing, listening, and speaking. Cultural topics are integrated into each unit. **Group 2 course.**

FRN 201  Intermediate French I ..................... 4.0 (4)  
Required prerequisite(s): FRN 102 with 2.0 or higher score on the NMC language placement test or instructor permission  
Recommended prerequisite(s): You will be required to read, write, listen and speak in French. You will need a minimal ability using technology to take advantage of out-of-class requirements.  
FRN 201 is designed to further develop language proficiency in reading, writing, listening, and speaking. A deeper exploration of French culture is presented in this course, allowing students to transform themselves into truly active and proficient language users. **Group 1 course.**

FRN 202  Intermediate French II .................... 4.0 (4)  
Required prerequisite(s): FRN 201 with 2.0 or higher score on the NMC language placement test or instructor permission  
Recommended prerequisite(s): You will be required to read, write, listen and speak in French. You will need a minimal ability using technology to take advantage of out-of-class requirements.  
FRN 202 is a continuation of FRN 201 and focuses on the application of the communication skills of reading, writing, listening, and speaking within cultural contexts. **Group 1 course.**

For course availability, refer to [www.nmc.edu/class-search](http://www.nmc.edu/class-search)
**GEO Geography**

**GEO 101 Introduction to Geography** .................. 3.0 (3)
Recommended prerequisite(s): MTH 08
Note: Students placing below ENG 111 levels on the placement test should plan on additional study time.
This course emphasizes both the physical and the cultural aspects of geography. Physical factors such as weather, climate, soil, vegetation and landforms are considered as they determine the natural resources of a region. Various aspects of human culture such as religion, language and economic systems are studied to gain understanding of the ways in which people have used and misused their resources. Group 1 course.

**GEO 105 Physical Geography** .................. 3.0 (3)
**GEO 105L Physical Geography Lab.** .................. 1.0 (2)
Recommended prerequisite(s): MTH 23
Corequisite(s): GEO 105L
Note: Students placing below ENG 111 levels on the placement test should plan on additional study time.
Physical geography studies, selected elements of the physical environment: weather and climate, landforms, soil and vegetation. Particular emphasis is placed upon the nature and distribution of physical features throughout Michigan with respect to humankind. The lab includes field trips and emphasizes the application of physical principles through hands-on study of minerals, rocks, and soils; in conjunction with map and aerial photo interpretation. The lab emphasizes the application of selected physical elements through means of field work, map and aerial photo interpretation. Group 1 course.

**GEO 108 Geography of U.S. & Canada** .................. 3.0 (3)
Recommended prerequisite(s): Students scoring below ENG 111 on the placement test should plan on additional study time.
The diverse regions of Anglo-America will be investigated in this course. We will consider the relationship between the natural environment, the cultural background, economic conditions, and local problems of the U.S. and Canada. Group 1 course.

**GEO 109 World Regional Geography** .................. 3.0 (3)
This course is a study of world regions. For each region we will consider the relationship between the natural environment, cultural background, economic conditions, and local problems that relate to world issues. Group 1 course.

**GEO 115 Intro to GIS** ............................... 3.0 (4)
Required prerequisite(s): MTH 23, Intermediate computer skills (Windows) and Internet experience required.
This course explores the fundamentals of Geographic Information Systems (GIS) for map reading, interpretation and analysis, in conjunction with the principles of cartography. Computer and Internet technologies are utilized for the generation, manipulation, storage and retrieval of maps and associated geographic attributes. Topics covered include: basic GIS concepts, display of data and attributes, queries, metadata, tabular relationships, data editing, projections and datums, and basic cartography. Group 1 course.

**HAH Allied Health**

**HAH 100C Informatics Essentials** .................. 1.0 (1)
Recommended prerequisite(s): HNR 102, may be taken concurrently
This course will introduce students to informatics in health care and, in particular, nursing. Students will enhance their ability to use modern informatics such as computer and Internet resources as well as Electronic Medical Record (EMR) software, in the health care environment. This course is offered in a hybrid online and face-to-face format. Group 2 course.

**HAH 101 Medical Terminology** .................. 3.0 (3)
The student will learn the basic construction of medical words through the use of medical prefixes, suffixes, combining vowels and root words. This foundation will facilitate the understanding of new medical vocabulary encountered in other course work or work situations. Group 2 course.

**HAH 120 Infection Control** .............. 2.0 (2)
This course details the structure of infectious organisms and mechanisms of disease transmission, including host defenses against disease and specific diseases of concern to dental and medical personnel. In addition, the course provides an overview of MIOSHA (Michigan Occupational Safety and Health Act) regulations and occupational safety measures as they relate to the dental and medical fields. Group 2 course.

**HAH 200 Emergency Assessment & Intervention** .......... 3.0 (4)
A comprehensive study of the concepts and practices of first aid techniques. The course provides training for emergency care through assessment, critical thinking, implementation, documentation, and evaluation. It also addresses situations when injury or sudden illness becomes a threat to life, or problems develop that endanger physical or psychological well-being. Certification for CPR for the Professional Rescuer, HAZMAT, and Medical First Responder may be earned in cooperation with state and/or national agencies. Must be able to meet patient lifting and equipment requirements. Required for MCOLES Police Academy. Signature required to register. Group 2 course.
HDA Dental Assistant

HDA 101 Introduction to Dentistry ...................... 2.0 (2)
Students are introduced to the role of the dental assistant and the dental team and opportunities for employment. Students will be informed of the requirements for certification and registration and the various organizations and associations within dentistry and dental assisting. Other areas studied will include dental specialties, dental terminology, applied psychology in the dental office, instrument and equipment identification and charting. The student will have the opportunity to view a dental office to see the set-up and to observe the roles of each person on the dental team. Group 2 course.

HDA 112 Dental Materials ............................... 2.0 (2)
Recommended prerequisite(s): HDA 120, HAH 120
Corequisite(s): HDA 113
Students learn the preparation, manipulation, and use of dental materials commonly found in the dental office. There will be discussion regarding the equipment needed, mixing techniques, and proper usage of waxes, restorative materials, impression materials, gypsum products, cements, metals and therapeutic materials. Preparation of each material will be demonstrated. Group 2 course.

HDA 113 Dental Materials Lab.......................... 1.0 (2)
Corequisite(s): HDA 112
Recommended prerequisite(s): HAH 120, HDA 120
This course familiarizes the student with the handling of dental materials commonly used in the dental office. Opportunities are provided in the laboratory to develop skills in mixing techniques, impression taking, construction of study models, bleach and acrylic trays, and cleaning and polishing appliances. Group 2 course.

HDA 120 Dental Anatomy .............................. 3.0 (3)
The student will learn the anatomy and physiology of the oral cavity, teeth and head. Students will learn the histology of the teeth and surrounding structures, the bones of the skull, the nerves and blood supply of the head and neck, the muscles of mastication, and the names and functions of the teeth and oral structures. This class will also provide detailed information on the anatomy of the individual teeth. Group 2 course.

HDA 140 Oral Pathology/Pharmacology ............ 2.0 (2)
Recommended prerequisite(s): HDA 120
The purpose of this course is to familiarize the student with disease processes related to the oral cavity and to enable the student to identify these diseases. The student will become familiar with various drugs and their uses in dentistry, prescription writing and documentation, the sources of drugs, routes of administration, and the conditions that modify the reactions of drugs. Group 2 course.

HDA 150 Dental Office Management .................. 2.0 (2)
Students are acquainted with the procedures necessary for efficient dental office management. Topics include appointment book control, accounts receivable and payable, dental record keeping, third party payment, patient recall, inventory control, telephone techniques, and use of computer hardware and software unique to the dental office. This course is offered in a self-paced format. Group 2 course.

HDA 160 Dental Emergencies ......................... 1.0 (1)
This course acquaints the student with the types of emergencies that may arise in the dental office. The students will learn the procedures to follow when medical and dental emergencies occur, the importance and significance of obtaining accurate and complete patient histories, the proper emergency equipment necessary in a dental office and the maintenance of that equipment, the taking and recording of vital signs, basic first aid rules, and fire safety. Group 2 course.

HDA 170 Preventive Dentistry ....................... 2.0 (2)
This course deals with educating dental patients in proper oral hygiene and nutrition. The topics of discussion will include vitamins, minerals, fats, carbohydrates, proteins, food groups, fluoride treatments, oral examinations, pit and fissure sealants, public health dentistry, and oral hygiene instructions. Student demonstration and participation is emphasized. A dietary analysis will be learned and demonstrated by students. Two community presentations will be designed and presented by each student. Group 2 course.

HDA 240 Chairside Procedures ....................... 5.0 (5)
Recommended prerequisite(s): HDA 101, HDA 120, HAH 120, HDA 160, HDA 242, HDA 243
Corequisite(s): HDA 241
This course provides the foundation for dental assistant clinical procedures performed in both general and specialty dental offices. Topics include theory and application of four-handed dentistry; application of infection control procedures; an overview of procedures and techniques unique to dental specialties; and background information and technical skills performed by the Registered Dental Assistant. In addition, local dental specialists serve as guest speakers. Group 2 course.

HDA 241 Chairside Procedures Lab .................. 2.0 (5)
Corequisite(s): HDA 240
This is the clinical component of Chairside Procedures. Students learn and practice operative and specialty chairside techniques in a fully-equipped dental clinic. Students assist our staff dentist during simulated dental procedures. Expanded duties for dental assistants are also introduced in this course. Group 2 course.

HDA 242 Dental Radiography ....................... 2.0 (2)
Recommended prerequisite(s): HAH 120, HDA 120, HDA 160; all may be taken concurrently
Corequisite(s): HDA 243
The fundamentals of radiology as applied to dentistry will be presented. Special consideration will be given to radiation physics, hazards, biological effects, protection and quality control methods. Basic interpretation and radiographic anatomy will also be included. While extraoral techniques are discussed, emphasis will be given to the proper techniques for exposing, processing, and mounting traditional and digital intraoral radiographs of diagnostic quality. Group 2 course.
HDA 243 Dental Radiography Lab .................... 1.5 (3)
Corequisite(s): HDA 242
Clinical component of Dental Radiography lecture. Students will be introduced to a variety of radiography techniques and will learn how to expose, process and mount radiographs of diagnostic quality. Requirements include multiple sets on dental manikins and four FMX sets on dental patients utilizing digital and traditional techniques. Group 2 course.

HDA 251 Dental Assistant Internship I ............ 4.0 (4)
Required prerequisite(s): HDA 240, HDA 241
Students are assigned to dental offices in the community. 180 hours of hands-on experience includes chairside assisting, office management, laboratory techniques and expanded functions. Included are 3 hours of internship meetings with instructor and classmates. Group 2 course.

HDA 252 Dental Assistant Internship II .......... 4.0 (4)
Recommended prerequisite(s): HDA 251
A continuation of Internship I providing an additional 180 hours of hands-on experience. In addition to placement in dental offices in the community, students will observe in four specialty settings: oral surgery, orthodontics, periodontics, and endodontics. Included are 3 hours of internship meetings with instructor and classmates. Group 2 course.

HDA 282 CDA/RDA Written Exam Prep ........... 2.0 (2)
Recommended prerequisite(s): HAH 120, HDA 101, HDA 112, HDA 113, HDA 120, HDA 140, HDA 150, HDA 160, HDA 170, HDA 240, HDA 241, HDA 242, HDA 243, all may be taken concurrently
The purpose of this course is to prepare students and working dental assistants for the CDA and RDA written exams. Included are review sessions covering General Chairside, Infection Control, and Radiography for both exams and additional specific topics that relate directly to Michigan's expanded functions for dental assistants. Group 2 course.

HDA 286 RDA Clinical Exam Prep .................. 1.0 (1)
Required prerequisite(s): HDA 282
This course will provide dental assistant students with study/application sessions for the clinical portion of the state licensure exam. Expanded functions of special interest are dental amalgams, temporary crowns, and dental dams. Must be a current dental assistant student or a graduate of a post-secondary dental assistant program approved by the State Board of Dentistry. Group 2 course.

HF 101 Fitness Circuit I .............................. 0.5 (1)
Introduction to beginning aerobic conditioning through a fitness circuit designed for varying fitness levels. Instruction includes an orientation session, aerobic fitness, strength training, flexibility, and endurance. This self-directed course meets in the NMC Fitness Center using strength training equipment, exercise bicycles, and other aerobic equipment. Two hours per week on a flexible schedule. Offered summers only. Group 2 course.

HF 102 Fitness Circuit II ............................. 0.5 (1)
Recommended prerequisite(s): HF 111
Continuing beginning aerobic conditioning through a fitness circuit designed for varying fitness levels. Instruction includes aerobic fitness, strength training, flexibility, and endurance. This self-directed course meets in the NMC Fitness Center using strength training equipment, exercise bicycles, and other aerobic equipment. Two hours per week on a flexible schedule. Offered summers only. Group 2 course.

HF 105 Personal Trainer Certification ............. 3.0 (4)
Recommended prerequisite(s): HF 111
This course is designed to provide theoretical knowledge and practical skills in preparation for a national certification exam in personal training. Topics include guidelines for instructing safe, effective, and purposeful exercise, essentials of the client-trainer relationship, conducting health and fitness assessments, and designing and implementing appropriate exercise programming. Group 2 course.

HF 111 Fitness Circuit I ............................... 1.0 (2)
Introduction to aerobic conditioning through a fitness circuit designed for varying fitness levels. Instruction includes an orientation session, strength training, flexibility, and endurance with an emphasis on aerobic conditioning. This self-directed course meets in the NMC Fitness Center using strength training equipment, exercise bicycles, and other aerobic equipment. Two hours per week on a flexible schedule. Group 2 course.

HF 112 Fitness Circuit II ............................. 1.0 (2)
Recommended prerequisite(s): HF 111
Continuation of aerobic conditioning through a fitness circuit designed for varying fitness levels. Instruction emphasizes individual strength training and flexibility. This self-directed course meets in the NMC Fitness Center using strength training equipment, exercise bicycles, and other aerobic equipment. Two hours per week on a flexible schedule. Group 2 course.

HF 113 Fitness Circuit III ............................ 1.0 (2)
Recommended prerequisite(s): HF 112
Continuation of aerobic conditioning through a fitness circuit designed for varying fitness levels. Instruction emphasizes individual aerobic fitness options and the reduction of stress. This self-directed course meets in the NMC Fitness Center utilizing strength training equipment, exercise bicycles, and other aerobic equipment. Two hours per week on a flexible schedule. Group 2 course.
HF 114  Fitness Circuit IV ........................................ 1.0 (2)
Recommended prerequisite(s): HF 113
Continuation of aerobic conditioning through a fitness circuit
designed for varying fitness levels. Instruction emphasizes
individual fitness evaluation/workout, weight control, and nutrition.
This self-directed course meets in the NMC Fitness Center using
strength training and aerobic equipment, and exercise bicycles.
Two hours per week on a flexible schedule. Group 2 course.

HF 116  Yoga ......................................................... 1.0 (2)
Yoga is postural work emphasizing precise, careful body align-
ment and maximum spinal extension. Yoga works through the
concreteness of the body to teach balance and integration. It is
an effective way to stretch and strengthen the body. Using move-
ment and breath, yoga brings a therapeutic calm to the body and
mind, releasing stress and bringing relaxation. Group 2 course.

HF 118  Continuing Yoga ........................................ 1.0 (2)
Recommended prerequisite(s): HF 116 or instructor permission
Yoga techniques focus on understanding and controlling the
body, the breath, and the mind through exercises (asanas),
breathing techniques (pranayamas), and meditation training
(quieting the mind and body). Yoga poses are designed to
develop strength and give maximum flexibility to the mus-
cular, skeletal, and nervous systems with special emphasis on
building a strong, supple spine. Benefits include improved cir-
culation, hormonal balance, poise, and a more stable emotion-
al nature. Learning proper breathing will help you cope with
stress and increase your energy level. Wear loose, comfort-
able, layered clothing and plan to work barefooted. Bring
two blankets, a mat, and bath towel. Group 2 course.

HF 118A  Bikram Yoga I ........................................ 1.0 (2)
Recommended prerequisite(s): HF 118A
This is the original hot yoga, 105 degrees, pure, powerful,
authentic, unchanged, taught exactly as Hatha Yoga
Master Bikram Choudhury intends it to be taught. 26 poses,
two breathing exercises, 90 minutes, plus heat. Meets three
times per week on a flexible schedule. Group 2 course.

HF 118B  Bikram Yoga II ........................................ 1.0 (2)
Required prerequisite(s): HF 118A
Recommended prerequisite(s): Good heart health, not pregnant
A continuation of the original Hot Yoga, 105 degrees, pure,
powerful, authentic, unchanged, taught exactly as Hatha Yoga
Master Bikram Choudhury intends it to be taught. 26 poses,
two breathing exercises, 90 minutes, plus heat. Meets three
times per week on a flexible schedule. Group 2 course.

HF 121  Aerobic Dance I ........................................ 1.0 (2)
Through choreographed dance movements and contempo-
rary music, cardiovascular endurance, flexibility, strength and
coordination is promoted. Group 2 course.

HF 122  Step Aerobics I ........................................ 1.0 (2)
This body sculpting and fat burning program provides a uni-
que blend of exercise, bench and resistance training by combin-
ing Vertifirm (hips & thighs), hand held weights (upper body)
and low impact, high-energy step routines. Group 2 course.

HF 123  Step Aerobics ........................................... 0.5 (1)
This body sculpting and fat burning program provides a
unique blend of exercise, bench and resistance training by
combining Vertifirm (hips & thighs), hand held weights (up-
per body) and low impact, high-energy step routines. Offered
summers only. Group 2 course.

HF 124  Aerobic Dance .......................................... 0.5 (1)
Through choreographed dance movements and contemporary
music, cardiovascular endurance, flexibility, strength and coor-
dination is promoted. Offered summers only. Group 2 course.

HF 126  Lap Swim ............................................. 1.0 (2)
Recommended prerequisite(s): Ability to swim repeated
laps across a pool.
This self-directed course meets twice per week on a flexible
schedule. Use of basic strokes for fitness is reviewed. Emphasis
is on aerobic and muscular endurance through swimming a
variety of laps. Group 2 course.

HF 127  Lap Swim II ........................................... 1.0 (2)
Recommended prerequisite(s): HF 126
This self-directed course meets twice per week on a flexible
schedule. A continuation of the Lap Swim program. Empha-
sis is on increasing aerobic and muscular endurance through
swimming a variety of laps. Group 2 course.

HF 131  Aerobic Dance II .................................... 1.0 (2)
Recommended prerequisite(s): HF 121
A continuation of the Aerobic Dance fitness program.
Through choreographed dance movements and contempo-
rary music cardiovascular endurance, flexibility, strength, and
coordination is promoted. Group 2 course.

HF 132  Step Aerobics II ..................................... 1.0 (2)
Recommended prerequisite(s): HF 122
A continuation of the Step Aerobics fitness program. This
body sculpting and fat burning program provides a unique
blend of exercise, bench and resistance training by combin-
ing Vertifirm (hips & thighs), hand held weights (upper body)
and low impact, high-energy step routines. Group 2 course.

HF 133  Pilates ..................................................... 1.0 (2)
The Pilates method of body conditioning is a unique system
of stretching and strengthening exercises used to develop long,
lean bodies. This program uses floor exercises to strengthen
tone muscles, flatten abdominals, improve posture, flexi-
bility, balance, agility, and coordination. Group 2 course.

HF 143  Continuing Pilates ................................... 1.0 (2)
Recommended prerequisite(s): HF 133
Building on the fundamentals and exercises of the prerequisite
class Pilates, a continuation of mat exercises and equipment
will be added. The body will be challenged with moves that
call for more strength, coordination, balance, flexibility, and
control. Group 2 course.

For course availability, refer to www.nmc.edu/class-search
HNR Nursing

Completion all HNR courses require admission to the PN, ADN, or LPN to ADN Nursing Program with the exception of HNR 100.

HNR 100 Introduction to Nursing .................. 1.0 (1)
Required prerequisite(s): ENG 111, MTH 111
Presents the history of nursing & nursing education. Introduces professional nursing values and the attitudes and behaviors desired in nurses. Discusses nursing roles, career opportunities, and types of health care delivery settings. Introduces the student to legal and ethical issues related to the role and scope of practice of the licensed practical nurse and the registered nurse. Introduces basic concepts related to professionalism, patient-centered care, health, spirituality, culture, holism, and the impact of illness on the individual and his/her significant others. Covers beginning professional communication skills, collaboration, teamwork, and basic teaching/learning principles. Group 2 course.

HNR 101 Fundamentals of Nursing–Lecture ...... 4.0 (4)
Required prerequisite(s): BIO 228 w/grade of 2.5 or higher, HNR 100, both may be taken concurrently
Corequisite(s): HNR 102
Students learn the foundation for professional nursing practice. Emphasis is placed on the principles and skills needed to apply the clinical judgment required for safe patient centered care. Communication is emphasized as an essentials aspect of the professional role. Group 2 course.

HNR 102 Fundamentals of Nursing–Clinical...... 4.0 (12)
Required prerequisite(s): BIO 228 w/grade of 2.5 or higher, may be taken concurrently
Corequisite(s): HAH 100C, HNR 101
Through laboratory and/or clinical experience students learn about the professional identity of the nurse while acquiring and applying basic nursing knowledge, judgment, and skills in order to provide safe patient-centered care. The student also learns communication and collaboration skills. Group 2 course.

HNR 108 Pharmacology .......................... 3.0 (3)
Required prerequisite(s): BIO 228 w/grade of 2.5 or higher, may be taken concurrently
Students learn an overview of pharmacology with emphasis on clinical applications within the context of the nursing process. This course is organized by medication classification. It explores indications, modes of action, side effects, contraindications and interactions for the safe administration of selected drugs. Specific nursing judgment and collaborative responsibilities to drug administration are emphasized. Legal statutes and standards regulating drug administration within the scope of nursing professional identity are presented. Individualized patient variables across the lifespan will also be a focus of study. Group 2 course.

HNR 125 Lifespan Nursing Lecture ............... 5.0 (5)
Required prerequisite(s): BIO 240, HNR 108, both may be taken concurrently, HAH 100C, HNR 100, HNR 101, HNR 102
Corequisite(s): HNR 126
Presentation of nursing management of health care issues related to uncomplicated pregnancy, birth, and neonatal period. Introduction of nursing management of common health alterations found in both chronically and acutely ill clients across the lifespan. Emphasis will be made on utilizing evidence-based practice to identify appropriate nursing interventions to achieve the desired outcome for the client based on their developmental level across the lifespan. Group 2 course.

HNR 126 Lifespan Nursing–Clinical ............... 5.0 (15)
Required prerequisite(s): BIO 240, HNR 108, both may be taken concurrently, HAH 100C, HNR 100, HNR 101, HNR 102
Corequisite(s): HNR 125
Clinical experiences providing opportunities to apply principles studied in HNR 125. Clinical learning environments will include the opportunity to apply medical-surgical, pediatric, and obstetric nursing interventions in a variety of settings, including acute care and simulation experiences. Group 2 course.

HNR 145 Practical Nursing Roles & Issues ....... 1.0 (1)
Required prerequisite(s): HNR 125, HNR 126, both may be taken concurrently
Reviews ethical/legal responsibilities of the LPN. Presents issues and trends related to LPN practice, nursing organizations, continuing education; and licensure. Discusses occupational opportunities and provides information on employment search, job-seeking skills and transition issues. Group 2 course.

HNR 241 Adv. Maternal Child Nursing–Lecture...... 3.0 (3)
Required prerequisite(s): HNR 247, HNR 248, may be taken concurrently
Corequisite(s): HNR 242
This course will expose the student to the complex problems facing families coping with complications during the child-bearing/child-rearing process. Characteristics of the at-risk family will be explored. These concepts will be applied to a review of complications occurring during the prenatal, intrapartal, and postpartal periods. The course will then deal with complex health problems during childhood and will include a discussion on perinatal loss and childhood death. A major theme throughout the course will be the use of the nursing process to promote optimal functioning for at-risk families. Community resources will be explored. Previous content on growth and development and cultural considerations will be reviewed briefly and concepts applied through class discussions and case scenarios. Group 2 course.
HNR 242  Adv. Maternal Child Nursing-Clinical ... 2.0  (6)
Required prerequisite(s): HNR 247, HNR 248, may be taken concurrently
Corequisite(s): HNR 241
This course provides for the clinical application of the principles presented in the co-requisite: HNR 241. Students will spend clinical time on a maternity inpatient unit. A clinical instructor will guide and support the student through observational experiences in labor and delivery and all students will have the opportunity to do postpartum and newborn assessments and care. Students will also spend clinical time in a precepted pediatric clinical caring for pediatric patients. Clinical time will also be spent doing an assessment on a family, assessing growth and development and community resources. Students will also be involved in clinical simulations and case studies. Students will participate in the above experiences by observing and/or directly providing care to at-risk families coping with childbearing and/or childrearing stressors/issues. Risk factors for these families may include developmental and psychosocial factors as well as physical alterations or complications. Group 2 course.

HNR 247  Nursing Mangement of Complex Patients I-Lec .......................... 3.0  (3)
Required prerequisite(s): BIO 240, HAH 100C, HNR 125, HNR 126
Recommended prerequisite(s): Admission to the Nursing program, GPA of 2.0 on all prerequisite nursing courses
Corequisite(s): HNR 248
Presentation of nursing interventions and management concepts required for adult patients with complex medical and/or surgical disorders. Emphasizes advanced assessment, analysis, nursing judgment, and nursing accountability. The focus is on adult patients with multiple complex requirements. Geriatric considerations are presented and integrated throughout. Group 2 course.

HNR 248  Nursing Mangement of Complex Patients I-Clinical .......................... 4.0  (12)
Required prerequisite(s): BIO 240, HAH 100C, HNR 125, HNR 126, or admission to the Nursing program and successful completion of prerequisite nursing courses with 2.0 or better
Recommended prerequisite(s): Admission to the Nursing program, GPA of 2.0 on all prerequisite nursing courses
Corequisite(s): HNR 247
Clinical experience providing opportunities to apply principles presented in HNR 247. Emphasis is upon refinement of organization, decision-making, critical thinking, and priority-setting skills in the care of multiple clients with complex medical/surgical disorders. Group 2 course.

HNR 251  Mental Health Nursing-Lec ..................... 2.0  (2)
Required prerequisite(s): HNR 241, HNR 242
Corequisite(s): HNR 252
This course is designed to enable the student to better understand behavior exhibited by persons with mental disorders. Classifications, causes, and symptoms of mental diseases are presented and treatments such as individual, group, and activity therapies are explored. Emphasis is placed on the ways by which the nurse determines, develops, implements, and evaluates a therapeutic environment for the client. The implementation of theories of human behavior is the scientific aspect of mental health-psychiatric nursing; the purposeful use of self in the performance of care is the artful aspect. The goal is preventative and corrective impact upon mental illness and the restoration of optimal mental health. Group 2 course.

HNR 252  Mental Health Nursing-Clinical ............. 1.0  (3)
Required prerequisite(s): HNR 241, HNR 242
Corequisite(s): HNR 251
Clinical experience providing opportunities to apply principles presented in HNR251. A variety of clinical settings addressing mental health issues in acute care, long-term care, and in community agencies are utilized. Emphasis is placed upon the exercise of critical thinking in addressing mental health issues and concerns. Additionally, students identify and analyze community resources of importance to persons with mental health issues. Students participate in care in the clinical area approximately 12 hours per week for 3.5 weeks during the semester. Group 2 course.

HNR 261  Complex Patient Mgmt II-Lec ............... 3.0  (3)
Required prerequisite(s): HNR 251, HNR 252, may be taken concurrently
Corequisite(s): HNR 262
This course builds upon the context of HNR 247 with the presentation of nursing management of adult patients with complex endocrine, hepatic, and autoimmune disorders. Additionally, the course introduces principles of leadership and management as these relate to the delivery of nursing care to a group of patients. The principles of delegation, communication, and priority-setting are reviewed. The course discusses a variety of nursing management challenges related to team building, managing change, conflict resolution, power and authority, politics and political action, current economic aspects of health care, legal/ethical issues, and emergency preparedness. Career opportunities, job-seeking skills, NCLEX-RN preparation, and issues related to role transition are discussed in reference to the graduates’ move into the work force. The quality improvement process and evidence-based practice are considered as students research and deliver a group presentation related to a current issue or trend in nursing management. Group 2 course.
HNR 262 Complex Patient Mgmt II - Clinical ..........4.0 (12)
Required prerequisite(s): HNR 251, HNR 252, may be taken concurrently
Corequisite(s): HNR 261
Clinical experience providing opportunities to apply principles presented in HNR 261. A variety of clinical units in acute care and extended care settings are utilized. Emphasis is placed upon organizational skills, including time management, and the exercise of critical judgment in managing the care for a normal caseload of clients. The process of critical thinking is the nucleus necessary to achieve the course objectives. Students perform care in the clinical area 24 hours per week for 7.5 weeks during the semester. The course is designed to promote a successful role transition from student to entry-level professional nurse. Group 2 course.

HPD  Professional Development

HPD 110 Basic Life Support for Health...............0.2 (.2)
Care Providers
Provides basic life support training, certification, and recertification for students interested in becoming health care providers to provide them with life support skills needed for clinical practice. Group 2 course.

HST  History

HST 101 Western Civilization to 1500...............4.0 (4)
Recommended prerequisite(s): Placement into ENG 111
Students will analyze the distinctive characteristics of the development of Western Civilization, identify the achievements and limitations of these developments, and develop an awareness of how contemporary problems were caused by past forces. Students will learn how Western Civilization developed from Mesopotamian origins through The Renaissance, and how society has impacted both individuals and groups in Western Civilization. As students achieve these goals, they will develop skills in communication and critical thinking. Group 1 course.

HST 102 Western Civilization from 1500 ..........4.0 (4)
Recommended prerequisite(s): Placement into ENG 111
Students will analyze the distinctive characteristics of the development of Western Civilization, identify the achievements and limitations of these developments, and develop an awareness of how contemporary problems were caused by past forces. Students will learn how Western Civilization developed from The Renaissance through The Victorian Era, and how society has impacted both individuals and groups in Western Civilization. As students achieve these goals, they will develop skills in communication and critical thinking. Group 1 course.

HST 111 U.S. History to 1865 .........................4.0 (4)
Recommended prerequisite(s): Placement into ENG 111
Students will analyze the distinctive characteristics of the development of the United States, identify the achievements and limitations of these developments, and develop an awareness of how contemporary problems were caused by past forces. Students will learn how American society developed from Native American origins through Reconstruction, and how society has impacted both individuals and groups in America. As students achieve this goal, they will develop skills in communication and critical thinking. Group 1 course.

HST 112 U.S. History Since 1865 .................4.0 (4)
Recommended prerequisite(s): Placement into ENG 111
Students will analyze the distinctive characteristics of the development of the United States, identify the achievements and limitations of these developments, and develop an awareness of how contemporary problems were caused by past forces. Students will learn how American society developed from Reconstruction to the post-Cold War era, and how society has impacted both individuals and groups in America. As students achieve this goal, they will develop skills in communication and critical thinking. Group 1 course.

HST 211 Native American History ...................3.0 (3)
Recommended prerequisite(s): Placement into ENG 111
A history of the Native American experience from the pre-Columbian period to the post World War II era. Major emphasis is placed upon the social, political, and economic role of the Native American community in American society and its unique role as a part of that society. Students will also demonstrate an awareness of how contemporary problems were caused by past forces. Students will develop skills in analysis, critical thinking, historical reasoning and writing. Group 1 course.

HST 212 African-American History .................3.0 (3)
Recommended prerequisite(s): Placement into ENG 111
This course is a history of the African-American experience from African origins to the Modern era in America. Major emphasis is placed upon the social, political, and economic role of the African-American community in American society and its unique role as a part of that society. Students will also demonstrate an awareness of how contemporary problems were caused by past forces. As students achieve this goal, they will develop skills in analysis, critical thinking, historical reasoning, and writing. Group 1 course.

HST 213 American Women’s History ...............3.0 (3)
Recommended prerequisite(s): Placement into ENG 111
A history of American women’s experience from Native American origins to the Modern Era. Major emphasis is placed upon the social, political, and economic role American women in American society and their unique role as a part of that society. Students will also demonstrate an awareness of how contemporary problems were caused by past forces. As students achieve this goal, they will develop skill in analysis, critical thinking, historical reasoning, and writing. Group 1 course.
HST 225  American Civil War ...................... 3.0 (3)
Recommended prerequisite(s): Placement into ENG 111
This course is a study of the American Civil War. The instruc-
tional goal is to have students demonstrate through discussions
and essays the causes of the Civil War in antebellum America,
how the war was waged, why the North won and the South
lost the war, how the war affected American society, and how
the war led to Reconstruction. Students will demonstrate an
awareness of how contemporary problems were caused by past
forces. As students achieve this goal they will develop skills in
communications and critical thinking. Group 1 course.

HST 228  The Vietnam War .......................... 3.0 (3)
Recommended prerequisite(s): Placement into ENG 111
This course is a study of the history of the Vietnam War. The
instructional goal of this course is to have students demon-
strate through discussions and essays how America became in-
volved in Vietnam, how the war was waged, the war’s effect on
American society, and how the war affected Vietnam. Students
will also demonstrate an awareness of how Vietnamese culture
affected the war and how Vietnam has affected America’s
contemporary society. As students achieve this goal, they
will develop skills in communications and critical thinking.
Group 1 course.

HST 230  A History of Michigan ...................... 3.0 (3)
Recommended prerequisite(s): Placement into ENG 111
The instructional goal of this course is to have students
demonstrate through discussion and essays the distinctive
characteristics of Michigan history, the common characteristics
of Michigan history as compared to other states, the identi-
fication of achievements and limitations of Native American
societies within Michigan, and an awareness of how contemp-
orary problems were caused by past forces. This course covers
the period from the “earliest beginnings” to the “recent past.”
As students achieve this goal, they will develop skills in analy-
sis, critical thinking, historical reasoning, and writing.
Group 1 course.

HST 235  20th Century Europe ...................... 3.0 (3)
Recommended prerequisite(s): Placement into ENG 111
This course is a study of the history of Europe in the 20th cen-
tury with emphasis on Germany, England, France, and Russia.
The instructional goal is to have students demonstrate through
discussions and essays the distinctive characteristics of Euro-
pean civilizations, the common characteristics of European
civilizations, the identification of achievements and limitations
of European civilizations, and how Europe has affected Ameri-
can and America affected Europe. Students will demonstrate an
awareness of how contemporary problems were caused by past
forces. As students achieve this goal, they will develop skills in
analysis, critical thinking, historical reasoning, and writing.
Group 1 course.

HUM 101  Introduction to Humanities ............. 3.0 (3)
Recommended prerequisite(s): Placement into ENG 111
An interdisciplinary study of Western Culture focusing on the
interrelationships of art, literature, and philosophy as they
reveal the major ideas and values of Classical Greek, Roman,
Medieval, and Renaissance civilizations. Group 1 course.

HUM 102  Introduction to Humanities ............. 3.0 (3)
Recommended prerequisite(s): Placement into ENG 111
An interdisciplinary study of Western Civilization focusing on
the interrelationships of art, literature, and philosophy as they
reveal the major ideas and values of the Reformation, Baroque,
Neo-Classic, Romantic, 19th century and Modern periods.
Group 1 course.

HUM 116  World Cultures ............................ 4.0 (4)
Recommended prerequisite(s): Placement into ENG 111
The purpose of this course is to introduce major trends of
non-Western culture. HUM 116 explores the culture of Asia,
Africa, and the Americas utilizing an interdisciplinary and
thematic approach focusing on social/political/historical issues,
cultural and religious rituals, painting, sculpture, architecture,
film, music, and customs and traditions of each region.
Lectures focus on how cultures shape the world today, with
appropriate references to historical events and trends.
Group 1 course.

HUM 221  Russian Language and Culture ........ 4.0 (4)
The class includes both classroom work in Russian language
and culture as well as excursions and cultural experiences in
Russia. The cultural component is designed to provide students
with a context through which they will be able to understand
and process new cultural information. Students will gain
practical language skills that will be utilized during the time
in Russia. The approach is interdisciplinary and will include
units on economics, politics, history, music, architecture, and
literature. Group 1 course.
HVA 101 Introduction to HVAC/R .................. 3.0 (4)
This course covers safety concerns associated with the HVAC field, identification and use of trade tools, basic blueprint reading, introduction to different pipe and tubing types used for equipment, and threading and soldering techniques. A strong emphasis is placed on electrical theory and application as well as learning how to read electrical diagrams. **Group 2 course.**

HVA 106 Fundamentals of Heating .................. 3.0 (4)
Required prerequisite(s): HVA 101
This course focuses on the variety of heating systems in the HVAC career field. Students are introduced to the principles of combustion and the importance of combustion analysis. Gas furnaces, heating controls, oil fired equipment, humidification and electric heating systems are explored. **Group 2 course.**

HVA 122 Basic Refrigeration Fundamentals ........ 3.0 (4)
Required prerequisite(s): HVA 101
This course introduces students to the relationship between matter and energy as it relates to refrigeration process. The Laws of Thermodynamics and effects of pressures and vacuums on a system, and a thorough coverage of the basic refrigeration cycle is discussed, along with types of refrigerants and system components they will encounter. Students also learn basic servicing and testing techniques on refrigeration systems. **Group 2 course.**

HVA 126 Residential and Commercial A/C ........ 3.0 (4)
Required prerequisite(s): HVA 106, HVA 122
This course focuses on different types of air conditioning systems, ventilation and de-humidification equipment used in residential and light commercial applications. Students will learn about air source and geothermal heat pumps, mechanical and electrical troubleshooting techniques for air conditioning systems and explore indoor air quality and planned maintenance issues for all types of equipment. **Group 2 course.**

HVA 132 Commercial A/C and Refrigeration .... 3.0 (4)
Required prerequisite(s): HVA 126
This course focuses on larger commercial systems encountered in the HVAC field for air conditioning and refrigeration applications. Emphasis is placed on chilled water and hydronic heating systems, boilers, air handling equipment and cooling towers. Students will also learn about larger scale refrigeration systems used in supermarket and cold storage applications, ice machine operation, and discussion of control systems used throughout the field. **Group 2 course.**

HVA 136 EPA Certification .......................... 3.0 (3)
Required prerequisite(s): HVA 132
This course examines the impact of refrigerants on the environment and focuses on federal regulations regarding the use, recovery and disposal methods. Students are given the opportunity to earn their Type I, Type II or Universal Certification through this course. Upon successful completion of each test, the student will earn levels of certification recognized by the HVAC/R industry nationwide. **Group 2 course.**

LWE Law Enforcement

LWE 102 Police Operations ........................ 4.0 (4)
The student is introduced to educational and training requirements for employment in law enforcement, police community relations, the functions and objectives of a police department and the police response and responsibilities to the community. **Group 2 course.**

LWE 195 Police Practicum .......................... 4.0 (4)
This course will provide Law Enforcement students with the practical experience of observing five various shifts with officers. This should insure that candidates will understand what law enforcement officers actually do. Recording the experiences will also assist the student in report writing. **Group 2 course.**

LWE 210 Cultural Awareness/Diversity .......... 2.0 (2)
Students explore ethics, cultural diversity, interpersonal skills and the laws as they apply to today's modern policing. Title VII or the 1964 Civil Rights Act, Elliot Larson Civil Rights Act, Americans with Disabilities Act, ethnic intimidation, and sexual harassment will also be addressed. **Group 2 course.**

LWE 212 Criminal Investigation .................. 3.0 (3)
Students will be introduced to criminal investigation procedures including theory of an investigation, conduct at crime scenes, collection and preservation of physical evidence, methods used in police science laboratory, fingerprints, ballistics, documents, serology, photography, and related forensic sciences. **Group 2 course.**

LWE 214 Firearms ................................... 4.0 (8)
This course will assist the students in the development of safety skills and the appropriate use of firearms in completing the Michigan Commission on Law Enforcement Standards basic firearms course. Included will be an orientation to firearms, policies, procedures, and liability of firearms use and hands-on firearms range techniques. **Group 2 course.**

LWE 215 Defensive Driving ....................... 3.0 (6)
Defensive Driving will cover motor vehicle law, its application and jurisdiction and vehicle stops. This course will also include the teaching of driving skills needed by a law officer. **Group 2 course.**
LWE 216  Traffic Enforcement & Invest ..................3.0  (3)  
Traffic Enforcement and Investigation will include traffic control enforcement, the law and prosecution of operating under the influence of alcohol, accident investigation, and traffic accident evidence collection. **Group 2 course.**

LWE 218  Physical Training/Wellness .....................4.0  (5)  
This course is designed to give the students a complete understanding of wellness/physical fitness. The goal of the class is to develop a mentality that fitness is long term. Includes course lectures on the following topics: fitness and wellness, benefits and guidelines for exercise, coronary risk factors, stress management, nutrition, weight control, low back care, motivation and behavior change, and various ways to perform fitness tasks. This class also includes workouts, and testing students against Cooper Standards. **Group 2 course.**

LWE 225  Defensive Tactics .................................4.0  (5)  
*Required prerequisite(s): Must be approved by MCOLES and registered with the Director of the Police Academy prior to enrollment.*  
Students learn subject control with new mandatory guidelines from MCOLES (Michigan Commission on Law Enforcement Standards). Students will understand survival mindset, tactical communication, fear/anger management, and post force incident responsibilities. Student will demonstrate proficiencies in 14 defensive tactics outcomes specific to the career of Law Enforcement and will be assessed through written, practical and scenario based testing. Student must be registered with LWE coordinator prior to class enrollment and be in excellent physical condition. **Group 2 course.**

LWE 226  Michigan Criminal Law .........................3.0  (3)  
The study of substantive criminal law as a means of defining and preserving social order. Sources of criminal law; classification of crimes against persons, property and public welfare; principles of criminal liability; elements necessary to establish crime and criminal intent; specific crimes and defenses; and constitutional limitations are examined. **Group 2 course.**

LWE 227  Criminal Procedures .............................3.0  (3)  
*Recommended prerequisite(s): LWE 226*  
Criminal Procedures will study the administration of criminal justice, the nature and scope of police power, the concept of exclusion, laws of arrest, search and seizure and interrogation, the acquisition of evidence, and judicial protection of the accused. **Group 2 course.**

LWE 228  Speed Measurement/PBT .........................3.0  (3)  
This course will teach the legal and practical aspects of speed measurement and PBT (preliminary breath tester) operations. Class discussions will primarily be based on relationship between excessive speed, drinking and highway crashes. The course will also explore departmental policies and procedures concerning speed measurement and PBT use. Students will understand and demonstrate basic accident investigation and related accident evidence collection. **Group 2 course.**

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**MDK Maritime Deck**

MDK 100  Survival at Sea .....................................1.0  (2)  
This course of instruction covers the following: concentrated instruction and training for the U.S. Coast Guard certification as Proficiency in Survival Craft; including the fundamentals of seamanship, small boat handling with power and sail; construction equipment, and marking of the standard lifeboat; construction, equipment, and operation of inflatable life rafts; abandon ship procedures, man overboard procedures, and survival swimming; the launching and retrieval of lifeboats; sailboat nomenclature and operation. STCW.

MDK 104  Rigging & Ship Maintenance Lab .............1.0  (2)  
The purpose of this course is to provide the cadet an opportunity to acquire practical experience in general seamanship: including marlinespike seamanship, line handling; splicing line, splicing wire rope; rigging, block and tackle nomenclature and use; vessel maintenance, the practical application of the procedures and equipment used in vessel upkeep.

MDK 106  Watchstanding I .................................1.0  (2)  
*Required prerequisite(s): MDK 100*  
The purpose of this course is to provide an opportunity for the cadet to acquire practical experience in shiphandling with vessels sufficiently large to duplicate shiphandling problems encountered with much larger vessels. Topics covered include the general principles of ship control for both single and twin propeller vessels. Cadets are exercised in line handling, towing, anchoring techniques, landing techniques, and shipboard safety. Cadets will then advance through the use of simulation to shiphandling exercises dealing with the general principles of vessel control and the problems of handling a vessel in narrow channels. STCW.

MDK 112  Rules of the Nautical Road ....................2.0  (2)  
*Required prerequisite(s): MDK 100*  
Comprehensive study of the international rules of the road-COLREGS-including their origin, purpose, history, technical provisions, and application. Included is a comparative study of both international and inland rules, their interpretation and practical application as well as a study of case histories and legal interpretations resulting from collisions at sea. STCW.

MDK 121  Navigation I .....................................3.0  (3)  
*Required prerequisite(s): MTH 121*  
*Corequisite(s): MDK 122*  
An introduction to principles of piloting and marine navigation. Includes chart projection, the magnetic compass, chart usage, buoyage systems, aids to navigation, fixes, running fixes, and the use of standard tables. STCW.
MDK 122  Navigation I Lab .......................................... 1.0 (2)
Required prerequisite(s): MTH 121
Corequisite(s): MDK 121
This lab is taken concurrently with MDK 121 and concentrates on applying the principles of piloting to plotting on the chart. Chart projection and use will be introduced. Dead reckoning, terrestrial fixes, set and drift, lines of position, and the use of navigational instruments will be covered. STCW.

MDK 149  Damage Control & Safety ...................... 2.0 (2)
Required prerequisite(s): MDK 100
This course is designed to give the cadet a comprehensive knowledge of shipboard safety with particular emphasis on fire fighting and damage control. Subject areas include: personal safety, pollution, U.S. Coast Guard rules and regulations, temporary damage repair, shoring principles, and practical shoring problems. STCW.

MDK 200  Ship Business & Labor Relations .......... 3.0 (3)
This course provides instruction in the organization, administrative functions, and management of a merchant vessel as well as the systems of operation of ship's business. It includes the study of union contracts, grievance procedures and labor management relations.

MDK 206  Watchstanding II .............................. 1.0 (2)
Required prerequisite(s): MDK 210
The purpose of this course is to begin to develop a cadet's piloting and watch management skills. The use of the Ship-handling Simulator/Academy Vessels will allow the development of the Bridge Team Concept through piloting exercises.

MDK 210  Sea Project Deck ............................... 6.0 (6)
Required prerequisite(s): Must complete first academic year with a 2.0 or higher in all required courses
During this course the cadet is on board a Great Lakes commercial vessel, an ocean vessel or the Academy training ship. The cadet follows a prescribed course of study of vessel operations, safety and navigation equipment and techniques. In addition, the cadet spends a minimum of eight hours per day under supervision of licensed officers gaining experience in various duties and responsibilities.

MDK 221  Lakes Piloting ..................................... 2.0 (2)
Required prerequisite(s): MDK 121, MDK 210
Study of the Great Lakes and principal ports; this includes currents, depths, aids to navigation, prevailing winds and their effects, recommended courses, shoals, reefs and high traffic areas. Historic analysis will explain current practices.

MDK 222  River Piloting ..................................... 3.0 (3)
Required prerequisite(s): MDK 121, MDK 210
An indepth study of the rivers, channels, and the aids to navigation in these rivers and channels. The focus will be on the rivers that make up the Great Lakes connecting bodies, such as the St. Mary's, St. Clair, Detroit Rivers and the Welland Canal.

MDK 242  Ship Stability ..................................... 3.0 (3)
Required prerequisite(s): MDK 210, MTH 121
A study of the principles of stability, righting moment and righting arm, calculation of metacentric height, inclining experiment, stability computers and tables, practical stability and trim considerations. STCW.

MDK 250  Stability for the Engineer .................. 1.0 (1)
Required prerequisite(s): MNG 100, MNG 104, MNG 106, MTH 121, MTH 122
Principles, terms and procedures used in the determination of transverse, longitudinal, and damage stability of ships. Investigation of the physical laws affecting a floating body. Effects of cargo operation, free surface, fuel consumption, and flooding on vessel stability. Scrutiny of case studies involving both partial or total loss of stability.

MDK 311  Sea Project Deck ............................... 6.0 (6)
Required prerequisite(s): Completion of second academic year with a 2.0 or higher in all required courses
This course is a continuation of MDK 210 and is designed to provide the cadet with advanced knowledge and sailing time to meet the licensing requirements prescribed by the U.S. Coast Guard and the criteria established by the Maritime Administration. STCW.

MDK 312  Sea Project Deck ............................... 6.0 (6)
Required prerequisite(s): MDK 311
This course is a continuation of MDK 311 and is designed to further enhance the cadet's professional knowledge and sailing time to meet licensing requirements of the U.S. Coast Guard and the criteria established by the Maritime Administration. STCW.
MDK 324 Navigation III .............................. 3.0 (3)
Required prerequisite(s): MDK 221, MTH 122
Recommended competencies: ENG 111, MTH 111
An introduction to nautical astronomy concerned with the practical application of celestial navigation, the solving of the spherical triangle, star identification, measurement of time and us of instruments. This course will cover plane, mid-latitude, and Mercator sailings and how to apply them to navigational problems through the various time zones. Sunrise, sunset, twilight, moonrise, and moonset calculations for a moving vessel will be covered. STCW.

MDK 330 STCW Elementary First Aid .................. 2.0 (2)
This course meets the mandatory minimum requirements specified under STCW as related to medical first aid and basic safety training for all merchant mariners. This course is part of the STCW certification process. Cadets will learn to take immediate action upon encountering an accident or other medical emergency. STCW.

MDK 331 Electronic Navigation .......................... 3.0 (3)
Required prerequisite(s): MDK 210
Corequisite(s): MDK 332
Recommended competencies: ENG 111, MTH 111
An in-depth study of various electronic navigation systems with emphasis on radar and covering the theory, operation, use and general maintenance of each system. Required course, must be successfully completed before cadet may receive Radar Observer Certificate. STCW.

MDK 332 Electronic Navigation Lab ..................... 1.0 (2)
Required prerequisite(s): MDK 210
Corequisite(s): MDK 331
Recommended competencies: ENG 111, MTH 111
A practical course to understand the use and operation of a Marine Radar, how to avoid collision situations (Rapid Radar Plotting), use and operation of Automatic Collision Avoidance System, Gyrocompass theory, Loran “C” theory and operation, GPS theory and operation, depth sounder theory and operation. Note: Required course, must be successfully completed before student may receive Radar Observer Certificate. STCW.

MDK 333 Automatic Radar Plotting Aids ............... 1.0 (1)
Required prerequisite(s): MDK 331, MDK 332
Recommended competencies: ENG 111, MTH 111
This course presents the principles and operations of automatic radar plotting aids. It includes the legal aspects of ARPA including IMO and USCG standards, the theory of input and processing characteristics of ARPA, the theory of operation, control functions and adjustments, the acquisition and tracking of contacts, the limitations of and potential errors of ARPA, and special ARPA related features. The cadet will demonstrate the setup and practical use of two actual automatic collision avoidance radars. STCW.

MDK 341 Ship Construction ............................. 2.0 (2)
Required prerequisite(s): MTH 122, completion of 1st academic year with a 2.0 or higher in all required classes.
Recommended competencies: ENG 111, MTH 111
A study of the principles of hull construction as applied to all types of vessels. Includes construction nomenclature, criteria of design, methods of construction, materials used in construction, and the forces acting on the hull. STCW ’10.

MDK 345 Dry Cargo Stowage ............................ 3.0 (3)
Required prerequisite(s): MDK 210, MDK 242
Recommended competencies: ENG 111, MTH 111
Principles and problems of the stowage and carriage of cargo: bulk cargo, container cargo, refrigerated cargo, grain cargo and dangerous cargo; cargo handling operations, both loading and unloading equipment. Cargo stowage plans will be developed and reviewed. Cadets will critique loads they were involved with during their time aboard ship. STCW.

MDK 404 Marine Supervisory Lab ..................... 1.0 (2)
This course will provide senior cadets with the experience of supervising subordinate cadets. This experience will include job planning, sequencing of tasks, tools and equipment needed, and personnel required to complete the job. The student will experience what it will be like to be responsible for the crew both in terms of safety and output.

MDK 411 Marine Communications ....................... 2.0 (2)
This course is designed to acquaint the student with the Global Maritime and Distress Safety System. It includes the basic layout of the GMDSS, communication equipment requirements, licensing requirements, principles and procedures for marine communications, the characteristics of radio wave propagation, frequencies, and modulation. Included also is the Morse Code, Flashing Light and general Distress Signals. STCW.

MDK 431 ECDIS ........................................... 3.0 (3)
Required Prerequisite(s): MDK 121, MDK 331, MDK 333
Recommended competencies: ENG 111, MTH 111
The purpose of this course is to meet the training requirement is STCW, as amended, for the operational use of Electronic Chart Display and Information Systems (ECDIS). This course provides the knowledge, skill and understanding of ECDIS emphasizing both the application and learning of ECDIS in a variety of underway contexts. This is achieved through use of a sophisticated navigation simulation integrated with a type-approved ECDIS.

MDK 444 Cargo Systems ................................. 2.0 (2)
Required prerequisite(s): MDK 210, MDK 242
Recommended competencies: ENG 111, MTH 111
An in-depth study of the Great Lakes self-unloading vessel, container vessels, tankers, passenger vessels, regulations concerning hazardous materials, government regulations and the relationship between vessel and shoreside operations.
MDK 445 Liquid Cargo Stowage ........................... 2.0 (2)
Required prerequisite(s): MDK 210, MDK 242
Recommended competencies: ENG 111, MTH 111
A study of the tanker industry and the operational aspects of the tank vessel, pollution, prevention, precautions and procedures; layouts of different types of tankers; operations sequence and oil tanker construction and terminology. USCG and OPA ’90 regulations will be covered. STCW.

MDK 446 Bridge Team Management ....................... 3.0 (3)
Required prerequisite(s): MDK 206, MDK 210
Recommended competencies: ENG 111, MTH 111
The purpose of this course is to further develop, through the use of the Shiphandling Simulator, the cadet’s watch management and watch standing skills, bridge team problem solving, and piloting procedures for various confined waterways on the Great Lakes and other waterways. The cadet will be required to operate the normal pilot house equipment, manage bridge personnel, and be familiar with the paperwork required in the operation of a vessel. STCW.

MDK 448 Pilot/Mate License Prep ............................. 4.0 (4)
Required prerequisite(s): MDK 312
Recommended competencies: ENG 111, MTH 111
A complete review of all professional subjects studied in the Maritime program pragmatically developed to reflect the essentials of the U.S. Coast Guard examinations. The final grade for this course is dependent on taking the U.S. Coast Guard exam. Cadets must complete all MDK courses with a 2.0 or better. (This class is for GLMA cadets only).

MDK 454 GMDSS ................................................. 3.0 (3)
Required prerequisite(s): MDK 411
Recommended competencies: Elementary computer skills Certificate for the Global Maritime Distress and Safety System (GMDSS). A cadet successfully completing this course and passing the prescribed examination will be licensed and enabled to efficiently operate a ship station’s GMDSS equipment, and to have primary responsibility for radio communications during Distress incidents.

MFG Manufacturing Technology

MFG 103 Manufacturing Processes ......................... 3.0 (3)
Required prerequisite(s): Completion of first academic year.
Recommended competencies: ENG 111, MTH 111
This course explores the principles of production technology as they relate to construction and manufacturing, using four major types of knowledge: science, technology, humanities, and descriptive. Students will learn the entire production cycle used in various industries, from raw materials to consumer products, and develop a heightened awareness of the by-products of those processes. Group 2 course.

MFG 104 Fluid Power ............................................. 4.0 (5)
Recommended competencies: MTH 23 and ENG 97/107
This course is designed to provide students with a basic understanding of the concepts and applications of fluid power technology and the necessary skills for further study in the field. The course is an overview of fluid power technology applications; the general concept of fluid power systems; an introduction to energy input, energy output, energy control, and systems auxiliary components; as well as the design and function of components. Group 2 course.

MFG 111 Math for Manufacturing ............................. 3.0 (3)
Required prerequisite(s): MTH 23 or COMPASS placement into MTH 111
This course will apply principles of mathematics, geometry, and basic trigonometry to applications in manufacturing. Topics will include proportions, calculation of machine speed and feed and geometric relationships of triangles and circles. Problem solving will require the use of the Pythagorean Theorem and the sine, cosine, and tangent functions to solve right triangles. The Law of Sines and Law of Cosines will be used to solve oblique triangle applications. Group 2 course.

MFG 113 Machining I .............................................. 3.0 (5)
The student will be introduced to precision measurement and the safe use of layout and bench tools, drill press operations, and basic lathe facing and turning operations. Basic vertical milling operations will also be included. Group 2 course.

MFG 304 Marine Hydraulics ................................. 4.0 (5)
Required prerequisite(s): MFG 104, MTH 111
Marine Hydraulics focuses on the systems, applications, hydraulics, and safety requirements specific to the marine and offshore ROV environments. The design, repair and maintenance of launch and recovery equipment, hoses, sensors and components associated with ROV hydraulic systems will be emphasized. Students will use test equipment and protocols to develop troubleshooting methods to analyze and integrate this technology. Group 2 course.
**MGT Management**

**MGT 241 Principles of Management** ................. 3.0 (3)

Recommended prerequisite(s): BUS 101, placement into ENG 111

What do managers actually do? This applications-oriented course will teach you the basics of day-to-day managerial work-planning, organization, leading, and controlling. Realistic scenarios are explored in areas of leadership, communication, planning, conflict, strategy, problem solving, and working in teams. **Group 2 course.**

**MGT 245 Principles of Entrepreneurship** ........... 3.0 (3)

Recommended prerequisite(s): BUS 101, MKT 201

This course provides practical knowledge needed for entrepreneurs with special attention focusing on creativity, opportunity, and feasibility of a new start up. Sources of funding and resources for small ventures are addressed indepth in this course to prepare the learner for practical application. This course primarily focuses on idea generation and start-up of the business including risk, funding sources, cash-flow, and awareness of external environmental factors that impact the business. The course project is the development of a feasibility study or related project. Feasibility studies include the extent to which an idea is viable, realistic and the extent to which the entrepreneur is aware of internal and external forces that could affect the business. **Group 2 course.**

**MGT 246 Entrepreneur Marketing & Finance** ...... 4.0 (4)

Required prerequisite(s): MGT 245

This course provides the student with a micro-business experience in which teams will start, manage, and close an enterprise in 15 weeks. An in-depth focus and experience on marketing and finance issues unique to entrepreneurs will be provided. Topics include niche marketing, guerrilla marketing, strategic partnerships, social media, e-marketing to international markets, capital resource acquisition, cash flow, pro-forma planning, strategic ownership models, sales skills and strategy. The topics are put into play by the assignment of a community business mentor. **Group 2 course.**

**MGT 251 Human Resources Management** .......... 3.0 (3)

Recommended prerequisite(s): BUS 101, placement into ENG 111

Human Resource managers are especially challenged today navigating employment waters that require expertise in employment legislation, recruitment, selection, training and development, compensation, employee appraisal, labor relations, safety and health. Theory and practice of these topics are explored with special emphasis on day-to-day applications in the workplace. **Group 2 course.**

**MKT Marketing**

**MKT 201 Principles of Marketing** ..................... 3.0 (3)

Recommended prerequisite(s): BUS 101, placement into ENG 111

This course surveys the wide scope of marketing as it influences both profit and nonprofit firms with emphasis on the marketing concept as a business philosophy. Ethics, globalization and technological advances in marketing will be explored. Elements of the marketing mix and the elements of the promotional mix will be studied and incorporated into a marketing plan. Target marketing and segmentation of consumer markets along with consumer buying behavior will be studied in this course. **Group 2 course.**

**MKT 241 Principles of Advertising** .................. 3.0 (3)

Recommended prerequisite(s): BUS 101, placement into ENG 111

This course will prepare the learner with an understanding of the real economic, social and cultural impact of advertising and conversely, the impact of society’s values on advertising. The strategic function of advertising within the broader context of business and marketing will be discussed in this course. The creative aspects of advertising will be studied, and students will develop an advertising campaign or related project. The global effect of marketing and advertising on business and national economics will be addressed along with ethical issues related to truth in advertising in today’s society. **Group 2 course.**

**MNG Maritime Engineering**

**MNG 100 Intro to Marine Engineering** .............. 1.0 (2)

This course is a general introduction to the shipboard Engine Room. The duties and responsibilities of the engine room personnel will be covered. The course will include an introduction to the engine room propulsion systems (diesel and steam), and a study of the operation of the ship’s steering gear and deck machinery. This course provides a foundation for the deck and engineering cadet to build upon in his/her program of study.

**MNG 104 Engine Systems Graphics** ................. 3.0 (3)

Required prerequisite(s): MNG 100

Corequisite(s): MNG 110

The course will introduce the cadet to the proper use of measuring systems and drafting equipment. The course will develop the correct techniques used in the production of multiview projection, orthographic representation, auxiliary views, section views, and dimensioning. The cadet will be familiar with the correct (ANSI) symbols used in piping, electrical, and fluid power schematics. The cadet will be instructed in the use of AutoCAD LT to produce the listed topics. STCW.
MNG 105  Shipboard Information Systems .......... 3.0 (3)
This course will introduce the cadet to techniques in brain
storming, consensus building, and decision making. Building
flow charts for process flow and control will be covered.
Using the PC aboard ship and in the marine environment
will be covered. Maritime specific software such as NS5 will
be demonstrated. The effective use of simulation as part of
training and upgrading will be covered.

MNG 110  Engineering Mechanics ...................... 3.0 (4)
Required prerequisite(s): MNG 100
Corequisite(s): MNG 104
Survey of the construction, operation, and maintenance of
shipboard systems. The major emphasis will be on piping,
valves, control valves, and pumps. Practical application of
the above items will be supported in the lab portion of this
course. STCW.

MNG 234  Electronic Fundamentals ...................... 4.0 (4)
Required prerequisite(s): MNG 104
This course bridges the gap between theoretical physics and
practical hands-on technology. Industrial electrical safety,
shock hazards, and emergency procedures are stressed. The
cadet receives practical hands-on practice with both digital,
analog meters and oscilloscopes. Digital and analog circuits
are constructed and examined both in the lab and with computer
simulations. Practical considerations of circuit construction
in the field are discussed in terms of ABS, USCG, and IEEE
regulations and requirements. The cadet is also introduced to
concepts of logic with emphasis being placed on the under-
standing and construction of ladder diagrams and the use of
truth tables for troubleshooting electronic circuits. STCW.

MNG 250  Unloading Systems .............................. 3.0 (4)
Required prerequisite(s): MNG 110
This course will introduce the cadet to the shipboard Unload-
ing Systems used aboard Great Lakes Bulk Carriers. The cadet
will study the operation and maintenance of this unloading
equipment. This instruction is supported by work in the lab.
A review of Pollution Regulations will also be covered. STCW.

MNG 260  Maritime Machining .............................. 2.0 (3)
Required prerequisite(s): Completion of first academic year.
Recommended competencies: ENG 111, MTH 111
This is a basic course that when completed a student will
know the fundamentals and be able to operate common
machine tool equipment like an engine lathe, band saw and
horizontal and vertical milling machine. Also covered will be
measuring and inspection tools, drill press and surface plate.

MNG 270  Issues in Power Production ............. 3.0 (3)
This course will delve into current issues in the field of com-
cmercial power production, including such areas as local, state,
and federal requirements and interfaces. Renewable energy
such as solar, wind, and biomass will be covered in detail. The
future of energy and how it affects society will be explored.
Students will explore issues currently facing the power
production issue.

MNG 271  Maritime Welding .............................. 2.0 (3)
Required prerequisite(s): Completion of first academic year.
Recommended competencies: ENG 111, MTH 111
A welding theory and practice course offered as an elective
to anyone interested in welding. Manipulative skills are
emphasized for the gas metal arc, shielded metal arc, oxy-fuel
and braze welding processes. An introduction to plasma arc
cutting, gas tungsten arc, resistance spot welding, stud welding
and plastic welding is included. Appropriate reading assign-
ments are included.

MNG 275  Refrigeration .................................... 3.0 (3)
Required prerequisite(s): MNG 110, PHY 105
Recommended competencies: ENG 111, MTH 111
This course provides instruction in the operation and mainte-
nance of refrigeration and air conditioning equipment used on
merchant vessels. It covers the theory of refrigeration and the
practical operation of refrigeration plants. Lecture reinforced
with the use of hands-on labs. STCW.

MNG 290  Power Systems Internship .............. 5.0 (5)
During this course, the student will be working in a com-
mercial power facility following a prescribed course in the study
of plan operations with particular emphasis on the machinery
room and auxiliary equipment, including safety requirements.
In addition, the student spends a minimum of eight hours a
day under the supervision of a licensed operator gaining expe-
rience in the various engineering duties and responsibilities.

MNG 314  Diesel Engineering ......................... 7.0 (7)
Required prerequisite(s): MNG 110
Recommended competencies: ENG 111, MTH 111
A comprehensive course dealing with the development of the
diesel engine as it applies to marine propulsion. This course
is designed to cover the construction, operation, and mainte-
nance of the diesel engine and its support systems. Lecture is reinforced with extensive use of hands-on labs and
computerized simulations. STCW.

MNG 317  Engineering Sea Project I ............. 3.0 (3)
Required prerequisite(s): MDK 149, MNG 314 or
instructor permission
During this course the cadet is on board the TS State of
Michigan. The cadet follows a prescribed course of study in
vessel operations with particular emphasis on engine room and
auxiliary equipment, including safety requirements. In addi-
tion, the cadet spends eight hours a day under the supervision
of a licensed officer gaining experience in various engineering
duties and responsibilities. STCW.

MNG 318  Engineering Sea Project II ............ 6.0 (6)
Required prerequisite(s): MNG 321, MNG 322, MNG 323,
MNG 317
This course is a continuation of MNG 317 and is designed to
provide the cadet with advanced knowledge and sailing time
to meet the licensing requirements of the U.S. Coast Guard,
STCW and the criteria established by the Maritime Adminis-
tration. STCW.
MNG 319  Engineering Sea Project III.................. 6.0 (6)
Required prerequisite(s): MNG 318
This course is a continuation of MNG 318 and is designed to provide the cadet with advanced knowledge and sailing time to meet the licensing requirements of the U.S. Coast Guard, STCW and the criteria established by the Maritime Administration. STCW.

MNG 321  Marine Boilers .................................. 3.5 (3.5)
Required prerequisite(s): MNG 104, MNG 105, MNG 110
Recommended competencies: ENG 111, MTH 111
This is an intensive study of marine boilers and covers all types of water tube boilers. Emphasis is placed on construction, operation and maintenance of equipment. Sub systems such as fuel handling and combustion chemistry, air handling, water preparation and chemistry, automated combustion systems, and water regulation systems are covered in detail. Special emphasis is placed on USCG regulations and STCW competencies. STCW.

MNG 322  Marine Turbines ................................. 2.5 (2.5)
Required prerequisite(s): MNG 104, MNG 105, MNG 110
Recommended competencies: ENG 111, MTH 111
This course is an in-depth study of marine turbine propulsion plants. It covers theory, construction, operation, maintenance and inspection procedures typically associated with marine use. Associated systems such as lubrication, exhaust and condensate systems are also covered. Drive trains, reduction gearing, stern tubes shafting and propellers are also discussed. STCW.

MNG 323  Marine Steam Lab................................ 1.0 (1)
Required prerequisite(s): MNG 104, MNG 105, MNG 110
Recommended competencies: ENG 111, MTH 111
This is a hands-on course intended to reinforce MNG 321 and MNG 322. Cadets will disassemble, inspect, and reassemble machinery typical of what is found aboard ship. Machinery condition will be noted and recommendations made. Machinery records will be updated. STCW.

MNG 335  Electric Machines & Controls .................. 4.0 (4)
Required prerequisite(s): MNG 234
Corequisite(s): MNG 336
This course covers the theory, application, operation, and maintenance of rotating machines as typically found aboard U.S. Merchant Ships and related industrial applications. Generators (DC and AC), motors (DC, multiple and single phase AC), transformers, and related equipment are covered. Special attention is given to magnet relay and electronic logic control circuits. Regulations specific to CFR title 46 and IEEE are reviewed. STCW.

MNG 336  Electric Machines & Controls Lab........... 2.0 (4)
Required prerequisite(s): MNG 234
Corequisite(s): MNG 335
Recommended competencies: ENG 111, MTH 111
This course is a companion class to MNG 235. Course material is reinforced with practical hands-on experience with universal electrical lab machinery. The operating characteristics of typical rotating machines are studied. Special attention is given to problems associated with multiple generator AC distribution. Safe and effective troubleshooting techniques are practiced on live 110/208 volt electrical control systems. STCW.

MNG 455  Watchstanding .................................... 2.0 (2)
Required prerequisite(s): MNG 314, MNG 317, MNG 321, MNG 322, MNG 323, MNG 335, MNG 336
Corequisite(s): MNG 466, MNG 496
Recommended competencies: ENG 111, MTH 111
Engineering simulators are used to strengthen the watchstanding skills of the engineering cadet. The cadet will be required to operate shipboard systems, manage engine room personnel, and become familiar with the paper work required in the operation of a modern engine room.

MNG 466  Engine Room Business .......................... 2.0 (2)
Corequisite(s): MNG 455, MNG 496
Recommended competencies: ENG 111, MTH 111
Cadets are introduced to the everyday management and administrative activities confronting the Marine Engineer. The cadet will be introduced to management and personnel skills necessary to deal with people problems peculiar to the marine environment. General issues of alcohol, drug abuse, and sexual harassment in the marine environment will be discussed and placed in perspective with USCG and STCW protocols. Other necessary skills such as program planning, flow-charting, recordkeeping, etc. will be introduced and practiced in scenarios. Legal considerations for the ship's officer such as log books, union contracts, certificates, evaluations, inspections, regulations, etc. will be introduced and discussed.

MNG 496  License Preparation Engine ..................... 2.0 (2)
Required prerequisite(s): MNG 314, MNG 317, MNG 321, MNG 322, MNG 323, MNG 335, MNG 336
Corequisite(s): MNG 455, MNG 466
Recommended competencies: ENG 111, MTH 111
A complete review of all professional subjects studied in the Maritime Engineering program. This course is designed to cover the essentials of the Third Assistant Engineer's examination administered by the U.S. Coast Guard. The final grade for this course is dependent on taking the U.S. Coast Guard license exam.
MNS  Naval Science

MNS 100  Naval Science ........................................ 2.0  (2)
Recommended prerequisite(s): Placement into ENG 111
This course is required of all GLMA cadets per U.S. Code. The course provides an introduction to naval science with an emphasis on Merchant Marine officers. It is intended to familiarize students with the interrelationship between the Merchant Marine and the Navy, as well as define the role of the Merchant Marine in war and peace time.

MNS 200  Naval Science II ...................................... 2.0  (2)
Required prerequisite(s): MNS 100
This course is required of all GLMA cadets who are Midshipmen in the Strategic Sealift Officer program. The class familiarizes the student with ships, aircraft, and operations of the US Navy. It includes instruction on naval communication, threats, and weaponry.

MNS 250  Leadership and Ethics .............................. 2.0  (2)
Required prerequisite(s): MNS 200 or instructor permission
This course integrates an intellectual exploration of Western moral traditions and ethical philosophy with a variety of topics, such as military leadership, core values, and professional ethics; the UCMJ and Navy regulations; and discussions relating to the roles of enlisted members, junior and senior officers, command relationships, and the conduct of warfare. The course provides midshipmen with a foundation of moral traditions, combined with a discussion of actual current and historical, to prepare them for the role and responsibilities of leadership in the naval service of the 21st century.

MTH  Mathematics

Students are REQUIRED to have and learn to use a TI-84 graphing calculator for ALL math classes.

MTH 08  Pre-Algebra ........................................ 4.0 (developmental) (4)
Required prerequisite(s): COMPASS placement
Recommended prerequisite(s): Basic mathematical skills
This course reviews the basic properties and operations on both whole numbers and the integers both by hand and using a scientific calculator. It then applies the order of operations, and then proceeds through basic number theory involving prime factorizations, divisibility rules, least common multiples, and greatest common factors. It continues with all operations with fractions and mixed numerals. It also applies these skills to the basics of ratios, rates and proportions. Several practical applications of percentages are covered. The Pythagorean Theorem is presented along with square roots. The course finishes with the study of measurement, in both English and metric units, along with their application to polygons and three-dimensional solids. Much of this topic involves measurement conversions and an introduction to dimensional analysis.

MTH 08A  Pre Algebra Part One ............................ 2.0  (2)
Corequisite(s): MTH 08B
This course reviews the basic properties and operations on both whole numbers and the integers both by hand and using a scientific calculator. It then applies the order of operations, and then proceeds through basic number theory involving prime factorizations, divisibility rules, least common multiples, and greatest common factors. It continues with all operations with fractions and mixed numerals. It also applies these skills to the basics of ratios, rates and proportions.

MTH 08B  Pre Algebra Part Two ............................ 2.0  (2)
Required prerequisite(s): MTH 08A with a 2.0 or higher
Corequisite(s): MTH 08A
MTH 08B begins with an introduction to decimal notation of positive and negative numbers, beginning with naming and rounding decimal quantities. All operations and properties are applied to decimals. Percent notation is introduced and its connection to fractions and decimals explained. Several practical applications of percentages are covered. The Pythagorean Theorem is presented along with square roots. The course finishes with the study of measurement, in both English and metric units, along with their application to polygons and three-dimensional solids. Much of this topic involves measurement conversions and an introduction to dimensional analysis.

MTH 23  Beginning Algebra .................................. 4.0 (developmental) (4)
Required prerequisite(s): MTH 08 or MTH 08A and MTH 08B with a 2.0 grade or higher or appropriate placement score
The course covers the arithmetic of integers and rational numbers, the properties of integral exponents, addition, subtraction, and multiplication of polynomials and factoring of polynomials. Solving linear equations, quadratic equations, and proportions is covered. Basic graphing of linear functions is also covered, including slope, x and y-intercepts. Problem solving is stressed, including unit conversions.

MTH 23A  Beginning Algebra Part One .................... 2.0  (2)
Required prerequisite(s): MTH 08 or MTH 08A and MTH 08B with a 2.0 grade or higher or appropriate placement score
Corequisite(s): MTH 23B
This course begins with a brief review of signed number operations applied both to integers and to fractions. The subsets of the real numbers are introduced. Students will learn linear equation solving techniques and apply them to conditional equations, identities, formulas and application situations. Next, students will learn Cartesian graphing especially as applied to linear relations. Extensive instruction with the TI-84 is accompanied by hand calculations. Good math writing form is stressed. This course requires completion of online homework.
Students are REQUIRED to have and learn to use a TI-84 graphing calculator for ALL math classes.

MTH 23B  Beginning Algebra Part Two .................. 2.0 (2)
Corequisite(s): MTH 23A
This course is a continuation of MTH 23A and begins with a study of exponents, scientific notation and dimensional analysis. Polynomials are used with all basic operations, and their graph patterns surveyed. After learning polynomial multiplication, students will learn to factor them in the most common patterns. From there the course covers quadratic equation solving, with some applications. Finally, it covers rational expressions in multiplication and division and solving proportions. This course requires completion of online homework.

MTH 111  Intermediate Algebra .................. 4.0 (4)
Required prerequisite(s): MTH 23 or MTH 23A and MTH 23B with a 2.0 or higher or appropriate placement score
Intermediate Algebra covers elementary set notation, a description of the Real number system and its major subsets, and an introduction to the Complex number system. Solving linear, quadratic, radical, rational, polynomial equations and linear inequalities are also covered. The course includes an investigation of graphical, numerical, and symbolic representations and manipulations of linear and quadratic functions. Matrices are introduced; properties of integral exponents are reviewed and extended to rational exponents. Intermediate algebra also covers simplifying, adding, subtracting, multiplying and dividing radicals. Problem solving and the function concept are integrated throughout. This course is offered in multiple formats such as online, self-paced or traditional; consult an advisor before enrolling. Students are REQUIRED to have and learn to use a TI-84 graphing calculator for ALL math classes. Group 2 course.

MTH 116 Intro. to Computer Science .................. 4.0 (4)
Required Prerequisite(s): MTH 111 or appropriate placement score
A high level computer language (currently Java) will be used to provide a thorough introduction to computer science, object-oriented programming, problem solving, and algorithm and data structure development. Illustrative applications and programming assignments will be given. Group 1 course.

MTH 120  Mathematical Explorations .................. 3.0 (3)
Required prerequisite(s): MTH 23 or MTH 23A and MTH 23B with a 2.0 or higher or appropriate placement score. Recommended prerequisite(s): High School algebra and geometry. ENG 111
This course is designed to meet the MTA graduation requirements in math for students whose programs of study have no further math requirements. This course is designed to develop quantitative reasoning skills as applied to personal and social issues. Topics will convey to the student the beauty and utility of mathematics, and its applications to modern society. Core topics include logic, models of growth (linear and exponential), personal finance, basic statistics and probability. Group 1 course.

MTH 121  College Algebra ............................... 4.0 (4)
Required prerequisite(s): MTH 111 or higher (excluding MTH 131, MTH 205 and MTH 206) or appropriate placement score
This course continues the development of algebraic skills begun in MTH 111. Topics include: functions, mathematical models, solving equations algebraically and graphically, polynomial, logarithmic, exponential functions, inverse functions, and linear and non-linear systems of equations. Group 1 course.

MTH 122  Trigonometry ............................... 3.0 (3)
Required prerequisite(s): MTH 121 or higher (excluding MTH 131, MTH 205 and MTH 206) or appropriate placement score
This course covers the definition and graphic representation of the trigonometric functions. Triangles, angle measure, equations, identities, and inverse functions are discussed in detail. Law of Sines, Law of Cosines, and equations of the conic sections will also be covered. Group 1 course.

MTH 131  Intro to Probability and Statistics ........... 3.0 (3)
Required prerequisite(s): MTH 111 or higher (excluding MTH 205 and MTH 206) or appropriate placement score
Descriptive statistics, experimental design, an introduction to probability concepts and inferential statistics are included in this course. Descriptive statistics includes graphical representations such as histograms, bar charts, pie charts, boxplots, stemplots, scatterplots, and the normal curve. Measures of central tendency such as the mean and median, and measures of variation such as the standard deviation and quartiles are studied. The normal density function and linear regression are included. One and two sample problems involving confidence intervals and significance tests are studied for the sample mean and the sample proportion. Students are REQUIRED to have and learn to use a TI-84 graphing calculator for ALL math classes. Group 1 course.

MTH 141  Calculus I .................................. 5.0 (5)
Required prerequisite(s): MTH 122 or MTH 140 or higher (excluding MTH 205 and MTH 206) or appropriate placement score
This is the first course in a traditional calculus sequence, emphasizing the development of the mathematical thought process. The topics covered include limits (definitions and limit proofs), continuity, derivatives of algebraic and trigonometric functions, applications of the derivative, the indefinite and definite integral, the fundamental theorem of calculus, and applications of integration. Group 1 course.

MTH 142  Calculus II .................................. 5.0 (5)
Required prerequisite(s): MTH 141
This course is a continuation of Calculus I. The topics include differentiation and integration involving exponential, logarithmic and inverse trigonometric function. There is an introduction of various integration methods. L'Hospital's Rule, improper integrals, parametric equations, polar coordinates, and infinite sequences and series are also investigated. Group 1 course.

For course availability, refer to www.nmc.edu/class-search
Students are REQUIRED to have and learn to use a TI-84 graphing calculator for ALL math classes.

MTH 205  Math for Elementary Teachers I ............. 4.0 (4)
MTH 111 or higher (excluding MTH 131) or appropriate placement score; MTH 111 must be completed with at least 2.0 grade
Recommended prerequisite(s): ENG 111
This course places an emphasis on the structure of elementary mathematics. Content includes problem solving and critical thinking using Polya’s four-step process, sets and set operations, relations, whole numbers, integers, rational numbers, irrational numbers, arithmetic algorithms in base ten and in other bases, properties of numbers, least common multiples, greatest common factors, fractions, ratios and proportions, percents, and elementary number theory. The course also includes the use of manipulatives, like Cuisenaire Rods, base pieces, and fraction pieces. Calculator use is incorporated into the course to give students calculator experience.  
Group 1 course.

MTH 206  Math for Elem. Teachers II ..................... 4.0 (4)
Required prerequisite(s): MTH 205 or higher (excluding MTH 131) or appropriate placement score
This course is a continuation of MTH 205. Content includes problem solving and critical thinking using Polya’s four-step process; basic statistics including mean, median, mode, range, standard deviation, graphical representations of data, linear regression, and weighted averages; probability including the fundamental counting principal, permutation, combination, partitions, experimental probability, theoretical probability, compound probability, probability tree diagrams, expected value and the concept of fair games. The course also explores the fundamental ideas of planar and spatial geometry which includes the analysis and classification of polygons, polyhedra, circles, spheres, cones and cylinders, area, perimeter, surface area and volume formulas, the concepts of tessellation, geometric constructions, basic geometry theorems, congruence, similarity, measurement, both direct and indirect, and dimensional analysis. This course also includes an introduction to the use of computer and/or graphing calculator software as learning tools for understanding concepts of informal geometry.  
Group 1 course.

MTH 241  Calculus III ........................................ 4.0 (4)
Required prerequisite(s): MTH 142
The course covers multivariable calculus including three-dimensional analytical geometry, vector valued functions, partial differentiation, multiple integration, line integrals, and an introduction to vector calculus (including divergence and curl). Applications of these topics and an introduction to linear algebra will also be covered.  
Group 1 course.

MTH 251  Differential Equations ............................ 4.0 (4)
Required prerequisite(s): MTH 142
Introduces the concepts of differential equations and of linear algebra. Topics include: solving linear and systems of linear differential equations, Laplace transformations and their physical applications. Solutions are found using analytical, numerical, and/or graphical techniques relating to quantitative modeling and Laplace transforms. Linear algebraic topics include: vector spaces, subspaces, spanning sets, linear dependence and independence, basis and dimensions, eigenvalues, eigenvectors, and linear transformations.  
Group 1 course.

MUS 90  Applied Music-Remedial .................... 1.0-2.0 (1-2)
Instruction
MUS 90 is remedial instruction for students wanting to take 100 level applied instruction in voice, piano, organ, guitar, or any of the traditional wind, percussion or string instruments, but lack either music reading, technical skills, artistic skills or tone production skills. An audition and interview, or if no music is prepared, only an interview will take place to determine the competency levels of a student. This course does not apply toward graduation. MUS 90 level instruction can be repeated until remediation is complete. Students meet with an assigned faculty member for weekly instruction at arranged time and place. Materials specific to the students needs will be assigned. The Applied Faculty will recommend to the acting Department chair when the competencies have been met.  
Group 2 course.

MUS 100A Intro to Music Theory I ................... 3.0 (3)
Corequisite(s): MUS 105A, MUS 106 or Applied Piano lessons
Intro to Music Theory I is designed for students who are pursuing music as an academic major or minor, particularly for those who need further work before entering MUS 101. This course focuses on the basic materials of music: structures of tonality, harmonic progression, and the technique of harmonization. Students are required to complete and analyze music, using practices listed above.  
Group 2 course.

MUS 100B Intro to Music Theory II ................... 3.0 (3)
Prerequisite(s): MUS 100A
Corequisite(s): MUS 105B, MUS 107 or Applied Piano lessons
Intro to Music Theory II is designed for students who are pursuing music as an academic major or minor, particularly for those who have completed MUS 100A or its equivalent and are not yet prepared to enter MUS 101. This course builds on the fundamentals of MUS 100A and includes a focus on more complex rhythmic and harmonic structures. Students are required to complete and analyze music, using practices and skills learned in the course.  
Group 2 course.
MUS 101  Theory of Music................................. 3.0 (3)
Recommended prerequisite(s): An understanding of music fundamentals
Corequisite(s): MUS 103, MUS 106 or Applied Piano lessons
Theory of Music course work is designed for students who are pursuing music as an academic major or minor. The first year includes the basic materials of music: the structures of tonality, harmonic progression, and the technique of harmonization. Students are required to complete and analyze music using practices listed above. Group 2 course.

MUS 102  Theory of Music................................. 3.0 (3)
Required prerequisite(s): MUS 101
Corequisite(s): MUS 104, MUS 107 or Applied Piano lessons
This course in Theory of Music is the second semester of a two semester/one-year sequence of coursework designed for students who are pursuing music as an academic major or minor. This course includes the basic materials of music: the structures of tonality, harmonic progression, and the technique of harmonization. Students are required to complete and analyze music using practices listed above. Group 2 course.

MUS 103  Sight Singing and Ear Training............... 1.0 (2)
Recommended prerequisite(s): An understanding of music fundamentals
Corequisite(s): MUS 101, MUS 106 or Applied Piano lessons
This course is the second semester of a two semester/one-year sequence of coursework designed for students who are pursuing music as an academic major or minor. The content of this course is the building of skills in reading music, and developing aural competency in interval relationships, scales, and triads, through a variety of musical practices. Group 2 course.

MUS 104  Sight Singing and Ear Training............... 1.0 (2)
Required prerequisite(s): MUS 103 or equivalent competency
Corequisite(s): MUS 102, MUS 107 or Applied Piano lessons
This course is the second semester of a two semester/one-year sequence of coursework designed for students who are pursuing music as an academic major or minor. The content of this course is a continued building of skills as listed in MUS 103 through a variety of musical practices. Group 2 course.

MUS 105A  Intro to Ear Training I....................... 1.0 (2)
Required prerequisite(s): Music Theory placement test
Corequisite(s): MUS 100A, MUS 106 or Applied Piano lessons
This coursework is designed for students who are pursuing music as an academic major or minor, particularly for those who need further work before entering MUS 103. The content of this course is the building of skills in reading music, and developing aural competency in interval relationships, scales, and triads, through a variety of musical practices, principally the voice. Group 2 course.

MUS 105B  Intro to Ear Training II..................... 1.0 (2)
Required Prerequisite(s): MUS 105A
Corequisite(s): MUS 100B, MUS 107 or Applied Piano lessons
This coursework is designed for students who are pursuing music as an academic major or minor, particularly for those who have completed MUS 105A or its equivalent and are not yet ready for MUS 103. This course will build on the skills learned in MUS 105A and will focus on developing more advanced skills, in reading music, aural competency in interval relationships, scales, and triads, through a variety of musical practices, principally the voice. Group 2 course.

MUS 106  Class Piano I...................................... 2.0 (2)
Piano study for the beginning or near-beginning student. This course focuses on the cultivation of technical-musical awareness and keyboard playing ability, individually and in ensemble. Group 2 course.

MUS 107  Class Piano II...................................... 2.0 (2)
Required prerequisite(s): MUS 106 or instructor permission
This course is the second of a four-semester/two-year sequence of the study of piano. Objectives of this course are the continued cultivation of technical-musical awareness and keyboard playing ability. Group 2 course.

MUS 110  Music Appreciation Stand Lit................. 3.0 (3)
This course is a survey of the history of Western Music from the medieval Europe to the present. Each music era of Western culture will be examined in regards to significant composers and compositions. This course places a strong emphasis on learning to listen and also provides students the opportunity to become familiar with the basic elements of music. No musical background or training is assumed or required. Group 1 course.

MUS 111  Music Appreciation Jazz....................... 3.0 (3)
Jazz Appreciation is a survey of the stylistic and historical elements of jazz from its earliest beginnings and influences through the contemporary jazz scene. Emphasis is placed on listening to the significant jazz artists and styles of each period of jazz. The class will also introduce students to the many musical characteristics, techniques, and terms found in the jazz tradition, as well as their historical significance. No musical background or training is assumed or required. Group 1 course.
MUS 112  Class Guitar I ........................................ 2.0 (2)
This course is designed for the student who wishes to acquire basic knowledge and techniques for guitar playing. The instruction introduces the basic information of music notation, as well as mechanical skills for the development of individual playing ability. The format is a structured approach covering hand position, fundamentals of reading music and chord knowledge. Repertoire will include Folk music, popular music and the Blues, and will utilize both strumming and picking techniques. Group 2 course.

MUS 113  Class Guitar II ........................................ 2.0 (2)
Recommended prerequisite(s): MUS 112
This course is a continuation of MUS 112. Emphasis is placed on developing music reading skills for the guitar, along with further development of Folk picking techniques and understanding of the Blues. An introduction to Jazz chords along with fundamentals of music theory will also be presented. Group 2 course.

MUS 114  NMC Grand Traverse Chorale ...................... 1.0 (2)
Required prerequisite(s): Choral experience or instructor permission
This large, mixed (SATB) choral ensemble is open to all students with past choral experience. The Grand Traverse Chorale provides its members with an educational experience and personal enrichment made possible through singing of quality choral literature selected from Antiquity through the 21st century with an emphasis on large masterworks. Performance excellence is principal to the purpose of the ensemble. The Grand Traverse Chorale performs throughout the semester and frequently performs with the Traverse Symphony Orchestra. Group 2 course.

MUS 115  NMC Grand Traverse Chorale ...................... 1.0 (2)
Recommended prerequisite(s): MUS 114 or instructor permission
MUS 115 is a continuation of rehearsal and performance as begun in MUS 114. This large, mixed (SATB) choral ensemble is open to all students with past choral experience. The Grand Traverse Chorale provides its members with an educational experience and personal enrichment made possible through singing of quality choral literature selected from Antiquity through 21st century with an emphasis on large masterworks. Performance excellence is principle to the purpose of the ensemble. The Grand Traverse Chorale performs throughout the semester and frequently performs with the Traverse Symphony Orchestra. Group 2 course.

MUS 116  NMC Chamber Singers .............................. 1.0 (3)
Required prerequisite(s): Choral experience or instructor permission
This mixed (SATB) choral ensemble is open to all students with past choral experience. The Chamber Singers provides its members with an educational experience and personal enrichment made possible through singing of quality choral literature selected from Antiquity through the 21st century with an emphasis on newer works and works for small choral ensembles. Performance excellence is principle to the purpose to the ensemble. The Chamber Singers perform throughout the semester and frequently perform with the Traverse Symphony Orchestra. Group 2 course.

MUS 117  NMC Chamber Singers .............................. 1.0 (3)
Recommended prerequisite(s): MUS 116 or equivalent, or audition by instructor
MUS 117 is a continuation of rehearsal and performance as begun in MUS 116. This mixed (SATB) choral ensemble is open to all students with past choral experience. The Chamber Singers provides its members with an educational experience and personal enrichment made possible through singing of quality choral literature selected from Antiquity through the 21st century with emphasis on newer works and works for small choral ensembles. Performance excellence is principle to the purpose of the ensemble. The Chamber Singers perform throughout the semester and frequently perform with the Traverse Symphony Orchestra. Group 2 course.

MUS 118  NMC Concert Band ................................ 1.0 (2)
Required prerequisite(s): Previous band experience
This course will provide a survey of significant concert and symphonic band repertoire. Students will learn performance techniques on their instrument as are relevant to the concert band medium. Students will also learn the role that their instrument plays within the context of a concert band. Generally, two to four concerts will be performed each semester. Students must have a high school level competency on a wind or percussion instrument. An audition or personal interview with the conductor will be required for placement in the ensemble. Group 2 course.

MUS 119  NMC Concert Band ................................ 1.0 (2)
Recommended prerequisite(s): MUS 118 or previous band experience
MUS 119 is a continuation of rehearsal and performance as begun in MUS 118. This course will provide a survey of significant concert and symphonic band repertoire. Students will learn performance techniques on their instrument as are relevant to the concert band medium. Students will also learn the role that their instrument plays within the context of a concert band. Generally, two to four concerts will be performed each semester. Students must have a high school level competency on a wind of percussion instrument. An audition or personal interview with the conductor will be required for placement in the ensemble. Group 2 course.

MUS 120  NMC Jazz Band ...................................... 1.0 (2)
Required prerequisite(s): Previous band or jazz band experience, or instructor permission
A course for the performer with a focus on big band jazz ensemble techniques and styles. A wide range of jazz styles are covered including swing, be-bop, ballads, rock/fusion and Latin. Some improvisation is briefly explored and always encouraged, although it is not the main focus of this course. A minimum of one concert will be performed each semester and all members are required to attend and participate in all scheduled performances. Group 2 course.
MUS 121  NMC Jazz Band .............................. 1.0 (2)
Recommended prerequisite(s): MUS 120, previous band or jazz band experience, or instructor permission
A course for the performer with a focus on big band jazz ensemble techniques and styles. A wide range of jazz styles are covered including swing, be-bop, ballads, rock/fusion and Latin. Some improvisation is briefly explored and always encouraged, although it is not the main focus of this course. A minimum of one concert will be performed each semester and all members are required to attend and participate in all scheduled performances. Group 2 course.

MUS 124  NMC Collegiate Singers ...................... 1.0 (3)
This choral ensemble is open to all students. The Collegiate Singers is designed for beginning and intermediate choral singers with specific instructional emphasis placed on singing and ensemble skills. This course will provide students with a broad base of skills that will be applicable to other choral ensembles in future collegiate years and beyond. The Collegiate Singers perform throughout the semester. Group 2 course.

MUS 125  NMC Collegiate Singers ...................... 1.0 (3)
MUS 125 is a continuation of rehearsal and performance as begun in MUS 124. This choral ensemble is open to all students. The Collegiate Singers is designed for beginning and intermediate choral singers with specific instructional emphasis placed on singing and ensemble skills. This course will provide students with a broad base of skills that will be applicable to other choral ensembles in future collegiate years and beyond. The Collegiate Singers perform throughout the semester. Group 2 course.

MUS 127  Traverse Symphony Orchestra ............... 1.0 (2)
This course is designed to give students the opportunity to study and perform orchestral literature, both standard and contemporary. The TSO, and its affiliated programs, is open by audition in the late summer and early fall of the year, and gives 8-10 public concerts per year. Performance is required for credit. Audition, rehearsal, and performance information is available through the music department. Group 2 course.

MUS 128  Traverse Symphony Orchestra ............... 1.0 (2)
Recommended prerequisite(s): MUS 127
This course is designed to give students the opportunity to study and perform orchestral literature, both standard and contemporary. The TSO, and its affiliated programs, is open by audition in the late summer and early fall of the year, and gives 8-10 public concerts per year. Performance is required for credit. Audition, rehearsal, and performance information is available through the music department. Group 2 course.

MUS 129  History of Rock & Roll .......................... 3.0 (3)
This course will study the development of rock music styles from its roots to the present. We will watch historical footage and listen to musical examples of each musical period. Students will develop the ability to hear a direct relationship between the historical origins of rock music and the music currently popular. The class will include the analysis of the significant musical qualities and influential musicians of the different periods and styles of rock. The history and development of rock music will also be examined in the context of the political, historical, and social forces at work in the modern and post-modern world. Group 1 course.

MUS 131-135 & 137-139 Ensembles ...................... 1.0 (2)
Applied Music I
Required prerequisite(s): Permission of the Director of Music Programs
This course prepares students for public performance and develops abilities in ensemble techniques. Students study in small ensembles (duets, trios, quartets, quintets, and octets) under faculty direction. Students are expected to perform, at a minimum, for one Music Convocation each semester. Course number suffix A designates fall semester and suffix B designates spring semester. Group 2 course.

MUS 136A Ensembles - Vocal Jazz I ..................... 1.0 (2)
Required prerequisite(s): Previous choral/vocal experience, or instructor permission
A small ensemble of men’s and women’s voices rehearses and performs vocal jazz works. Develop skills in vocal jazz styles, blending harmonies, microphone technique, and jazz theory. Group 2 course.

MUS 136B Ensembles - Vocal Jazz I ..................... 1.0 (2)
Required prerequisite(s): MUS 136A, previous choral/vocal experience, or instructor permission
A small ensemble of men’s and women’s voices rehearses and performs vocal jazz works. Develop skills in vocal jazz styles, blending harmonies, microphone technique, and jazz theory. Group 2 course.
MUS 140-160 & 162-168  Applied Music- ........ 1-2 (0.5-1)

Private Lesson
Note: 100 and 200 level courses may be taken three times.
Private lessons for strings, brass, woodwinds, guitar, piano, voice, organ, and percussion are offered. Students may enroll for 1.0 credit (for a 30 minute, weekly lesson) or for 2.0 credits (for a 60 minute, weekly lesson). Music Majors should enroll for 2.0 credits. After registering for Applied Lessons, please contact Jeffrey Cobb, Director of Music Programs (jecobb@nmc.edu or 231-995-1338), before or during the first week of classes for placement with an applied music instructor. A pre-arranged lesson time with the assigned instructor is arranged and studies/compositions, as appropriate, are prepared for continuing musical development. Students are expected to perform, at a minimum, for one Music Convocation each semester. Group 2 course.

MUS 201 Theory of Music................................................. 3 (3)
Corequisite(s): MUS 203, MUS 206
Recommended prerequisite(s): The successful completion of MUS 101, MUS 102, MUS 103, MUS 104, MUS 106, MUS 107 or the equivalent competency
The third semester of a four-semester/two year sequence of coursework designed for students who are pursuing music as an academic major. Harmonic analysis, traditional and non-traditional compositional techniques and musical form make up the course content. Group 2 course.

MUS 202 Theory of Music................................................. 3 (3)
Corequisite(s): MUS 204, MUS 207
Recommended prerequisite(s): The successful completion of MUS 101, MUS 102, MUS 103, MUS 104, MUS 106, MUS 107, MUS 206 or the equivalent competency
The fourth semester of a four-semester/two year sequence of coursework designed for students who are pursuing music as an academic major. The course content is a continuation of MUS 201 with the addition of the study of 20th century compositional and beginning counterpoint. Group 2 course.

MUS 203 Sight Singing & Ear Training ..................... 1 (2)
Corequisite(s): MUS 201, MUS 206
Recommended prerequisite(s): The successful completion of MUS 102, 104, 107 or the equivalent competency
The third semester of a four-semester/two-year sequence of course work designed for students who are pursuing music as an academic major. The content of this course includes the building of skills in reading music, melodic and harmonic dictation and aural competency through a variety of musical practices, principally the voice. Group 2 course.

MUS 204 Sight Singing & Ear Training ..................... 1 (2)
Corequisite(s): MUS 202, MUS 207
Recommended prerequisite(s): The successful completion of MUS 102, 104, 206 or the equivalent competency
The fourth semester of a four-semester/two-year sequence of course work designed for students who are pursuing music as an academic major. A continuation of MUS 203, this course deals with the building of advanced skills in reading music, melodic and harmonic dictation and aural competency through a variety of musical practices, principally the voice. Group 2 course.

MUS 206 Class Piano III.......................... 2.0 (2)
Corequisite(s): MUS 201, MUS 203
Recommended prerequisite(s): MUS 107 or instructor permission
This is the third of a four-semester, two-year sequence of the study of piano. Objectives are the cultivation of technical-musical awareness and keyboard playing ability. Group 2 course.

MUS 207 Class Piano IV.......................... 2.0 (2)
Recommended prerequisite(s): MUS 206 or instructor permission
This is the fourth of a four semester, two year sequence of the study of piano. Objectives are the cultivation of technical-musical awareness and keyboard playing ability. A continuation of MUS 206. Group 2 course.

MUS 214 NMC Grand Traverse Chorale............ 1.0 (2)
Recommended prerequisite(s): MUS 115, choral experience, or instructor permission
MUS 214 is continuation of rehearsal and performance as begun in MUS 115. This large, mixed (SATB) chorale ensemble is open to all students with past choral experience. The Grand Traverse Chorale provides its members with an educational experience and personal enrichment made possible through singing of quality choral literature selected from Antiquity through 21st century with an emphasis on large masterworks. Performance excellence is principle to the purpose of the ensemble. The Grand Traverse Chorale performs throughout the semester and frequently performs with the Traverse Symphony Orchestra. Group 2 course.

MUS 215 NMC Grand Traverse Chorale............ 1.0 (2)
Recommended prerequisite(s): MUS 214, choral experience, or instructor permission
MUS 215 is a continuation of rehearsal and performance as begun in MUS 214. This large, mixed (SATB) chorale ensemble is open to all students with past choral experience. The Grand Traverse Chorale provides its members with an educational experience and personal enrichment made possible through singing of quality choral literature selected from Antiquity through 21st century with an emphasis on large masterworks. Performance excellence is principle to the purpose of the ensemble. The Grand Traverse Chorale performs throughout the semester and frequently performs with the Traverse Symphony Orchestra. Group 2 course.
MUS 216  NMC Chamber Singers.................. 1.0 (3)  
Recommended prerequisite(s): MUS 117, choral experience, or instructor permission

MUS 216 is a continuation of rehearsal and performance as begun in MUS 117. This large, mixed (SATB) choral ensemble is open to all students with past choral experience. The Chamber Singers provides its members with an educational experience and personal enrichment made possible through singing of quality choral literature selected from Antiquity through 21st century with an emphasis on large masterworks. Performance excellence is principle to the purpose of the ensemble. The Chamber Singers performs throughout the semester and frequently performs with the Traverse Symphony Orchestra. Group 2 course.

MUS 217  NMC Chamber Singers.................. 1.0 (3)  
Recommended prerequisite(s): MUS 216, choral experience, or instructor permission

MUS 217 is a continuation of rehearsal and performance as begun in MUS 216. This large, mixed (SATB) choral ensemble is open to all students with past choral experience. The Chamber Singers provides its members with an educational experience and personal enrichment made possible through singing of quality choral literature selected from Antiquity through 21st century with an emphasis on large masterworks. Performance excellence is principle to the purpose of the ensemble. The Chamber Singers performs throughout the semester and frequently performs with the Traverse Symphony Orchestra. Group 2 course.

MUS 218  NMC Concert Band....................... 1.0 (2)  
Recommended prerequisite(s): MUS 119 or previous band experience

MUS 218 is a continuation of rehearsal and performance as begun in MUS 119. This course will provide a survey of significant concert and symphonic band repertoire. Students will learn performance techniques on their instrument as are relevant to the concert band medium. Students will also learn the role that their instrument plays within the context of a concert band. Generally, two to four concerts will be performed each semester. Students must have a high school level competency on a wind or percussion instrument. An audition or personal interview with the conductor will be required for placement in the ensemble. Group 2 course.

MUS 219  NMC Concert Band....................... 1.0 (2)  
Recommended prerequisite(s): MUS 218 or previous band experience

MUS 219 is a continuation of rehearsal and performance as begun in MUS 218. This course will provide a survey of significant concert and symphonic band repertoire. Students will learn performance techniques on their instrument as are relevant to the concert band medium. Students will also learn the role that their instrument plays within the context of a concert band. Generally, two to four concerts will be performed each semester. Students must have a high school level competency on a wind or percussion instrument. An audition or personal interview with the conductor will be required for placement in the ensemble. Group 2 course.

MUS 220  NMC Jazz Band.......................... 1.0 (2)  
Recommended prerequisite(s): MUS 120 or MUS 121, previous band or jazz band experience, or instructor permission

A course for the performer with a focus on big band jazz ensemble techniques and styles. A wide range of jazz styles are covered including swing, be-bop, ballads, rock/fusion and Latin. Some improvisation is briefly explored and always encouraged, although it is not the main focus of this course. A minimum of one concert will be performed each semester and all members are required to attend and participate in all scheduled performances. Group 2 course.

MUS 221  NMC Jazz Band.......................... 1.0 (2)  
Recommended prerequisite(s): MUS 220, previous band or jazz band experience, or instructor permission

A course for the performer with a focus on big band jazz ensemble techniques and styles. A wide range of jazz styles are covered including swing, be-bop, ballads, rock/fusion and Latin. Some improvisation is briefly explored and always encouraged, although it is not the main focus of this course. A minimum of one concert will be performed each semester and all members are required to attend and participate in all scheduled performances. Group 2 course.

MUS 224  NMC Collegiate Singers............... 1.0 (3)  
Open to students who have completed MUS 125 or a year of a collegiate choral ensemble. The Collegiate Singers is designed for beginning and intermediate choral singers with specific instructional emphasis placed on singing and ensemble skills. This course will provide students with a broad base of skills that will be applicable to other choral ensembles in future collegiate years and beyond. The Collegiate Singers perform throughout the semester. Group 2 course.

MUS 225  NMC Collegiate Singers............... 1.0 (3)  
Open to students who have completed MUS 224 or a year of a collegiate choral ensemble. The Collegiate Singers is designed for beginning and intermediate choral singers with specific instructional emphasis placed on singing and ensemble skills. This course will provide students with a broad base of skills that will be applicable to other choral ensembles in future collegiate years and beyond. The Collegiate Singers perform throughout the semester. Group 2 course.

MUS 227  Traverse Symphony Orchestra........ 1.0 (2)  
Recommended prerequisite(s): MUS 128

Open to students by audition who have completed one year of orchestra or collegiate equivalent as a transfer student. The study and performance of orchestral literature, both standard and contemporary. Performance is required for credit. Course is designed to give students basic knowledge of music fundamentals, styles and performance history. The TSO is open by audition in the late summer and early fall of the year, and gives 8-10 concerts per year. Audition, rehearsal, and performance information is available through the music department. Group 2 course.
MUS 228  Traverse Symphony Orchestra .......... 1.0 (2)
Recommended prerequisite(s): MUS 227
This course is designed to give students the opportunity to study and perform orchestral literature, both standard and contemporary. The TSO, and its affiliated programs, is open by audition in the late summer and early fall of the year, and gives 8-10 public concerts per year. Performance is required for credit. Audition, rehearsal, and performance information is available through the music department. Group 2 course.

MUS MUS 231-235 & 237-239  Ensembles – .... 1.0 (2)
Applied Music II
Required prerequisite(s): Permission of the music area coordinator and instructor
A continuation of Ensembles, with emphasis on performance and repertoire. This course prepares students for public performance and develops abilities in ensemble techniques. Students study in small ensembles (duets, trios, quartets, quintets, and octets) under faculty direction. Students are expected to perform, at a minimum, for one Music Convocation each semester. Course number suffix A designates fall semester and suffix B designates spring semester. Group 2 course.

MUS 236A Ensembles - Vocal Jazz II.................. 1.0 (2)
Recommended prerequisite(s): MUS 136B, previous choral/vocal experience, or instructor permission
A small ensemble of men's and women's voices rehearses and performs vocal jazz works. Develop skills in vocal jazz styles, blending harmonies, microphone technique, and jazz theory. Group 2 course.

MUS 236B Ensembles - Vocal Jazz II.................. 1.0 (2)
Recommended prerequisite(s): MUS 236A, previous choral/vocal experience, or instructor permission
A small ensemble of men's and women's voices rehearses and performs vocal jazz works. Develop skills in vocal jazz styles, blending harmonies, microphone technique, and jazz theory. Group 2 course.

MUS 240-267  Applied Music – ................. 1.0-2.0 (0.5-1)
Private Lessons
Required prerequisite(s): A minimum of two semesters of 100 level applied instruction or instructor permission
Note: 100 to 200 level courses may be taken three times.
Private lessons for strings, brass, woodwinds, guitar, piano, voice, organ and percussion are offered. Student may enroll for 1.0 credit (for a 30 minute, weekly lesson) or for 2.0 credits (for a 60 minute, weekly lesson). Music Majors should enroll for 2.0 credits. After registering for Applied Lessons, please contact Jeffrey Cobb, Director of Music Programs (jecobb@nmc.edu or 231-995-1338), before or during the first week of classes for placement with an applied music instructor. A prearranged lesson time with the assigned instructor is arranged and studies/compositions, as appropriate, are prepared for continuing musical development. Students are expected to perform for, at a minimum, one Music Convocation each semester. Group 2 course.

OUT  Outdoor Pursuits

Prerequisite for all Outdoor Pursuits courses: Students should be at a reasonably good physical fitness level and without current exercise-limiting injuries. These are high-participation courses in which most material is learned through experience on off-campus weekend field trips. Students with disabilities who need accommodations in order to complete these courses should contact the instructor prior to the first class meeting.

OUT 112  Winter Travel and Camping...............1  0 (2)
This course introduces the three-season backcountry traveler to safe and enjoyable winter outings. The focus is on winter safety, travel techniques (primarily Nordic skiing and snowshoeing), camping, menu planning, clothing and gear selection, navigation, and shelter building. Group 2 course.

OUT 125  Backpacking I............................1.0 (2)
The course is for novice backpackers. Information discussed and practiced includes basic backpacking skills, selecting of equipment, food planning and preparation, map and compass navigation, backcountry first aid and minimal impact camping. Group 2 course.

OUT 126  Backpacking II............................1.0 (2)
Recommended prerequisite(s): OUT 125 or three-day backpacking experience
This course is for backpackers with prior experience. Its purpose is to broaden the student's knowledge of backpacking techniques with special attention given to lightweight equipment, menu planning, itinerary planning, map and compass navigation, site selection, and other minimal impact considerations. Group 2 course.

OUT 130  Caving I.................................1.0 (2)
An introduction to the geology of cave formation and cave ecology. Additionally, by exploring non-commercial cave systems, students are introduced to the equipment, techniques, and safety systems associated with the sport of caving. Group 2 course.

OUT 131  Caving II.................................1.0 (2)
Recommended prerequisite(s): OUT 130 or instructor permission
This course focuses on safe and appropriate techniques for exploring caves, with an emphasis on selecting and using equipment, as well as implementing climbing/rappelling safety systems for cave exploration. Group 2 course.
OUT 132 Rock Climbing I ............................. 1.0 (2)
This course is a beginning rock climbing course to introduce students to climbing techniques, belaying, and safety practices related to class five climbing. Group 2 course.

OUT 133 Rock Climbing II ............................. 1.0 (2)
Recommended prerequisite(s): OUT 132 or instructor permission
Students will learn anchor selection, active and passive gear placement, and advanced belaying techniques, with an introduction to lead climbing. Group 2 course.

OUT 140 Snowshoeing ............................. 1.0 (2)
Students will learn how to dress for winter activities, orienteer, winter camp, adjust for emergency situations and explore a variety of locations off campus. Participants will become educated snowshoe consumers and best of all, HAVE FUN! Snowshoes provided. Group 2 course.

OUT 160 Canoeing I ............................. 1.0 (2)
Instruction in various techniques of canoeing are introduced in flat water (lake) and moving water (river). Two one-day trips are planned. Group 2 course.

OUT 161 Canoeing II ............................. 1.0 (2)
Recommended prerequisite(s): OUT 160 or instructor permission
This course is for canoers with prior experience in river canoeing. Wilderness travel by canoe with an over-night camping trip is planned. Group 2 course.

PE 101 Swing, Latin & Slow Dancing I ............................. 1.0 (2)
This course will introduce students to a fun form of exercise and recreation you can do for the rest of your life through swing and social dancing. Many styles of dancing will be covered including swing, jitterbug, tango, cha cha, waltz, slow dancing, two-step, Latin dancing, salsa, lambada, and many swing moves that can be incorporated into any dance situation. Please wear slippery-soled shoes. Group 2 course.

PE 101A Swing, Latin & Slow Dancing II ............................. 1.0 (2)
Recommended prerequisite(s): PE 101
Take each style of dance learned at the beginning level to a more advanced level. Learn swing improvisation and aerials safety and spotting, advanced waltz and slow dancing techniques including lifts, more advanced moves in each of the Latin dances and a new dance, and we will explore the depths of Argentine Tango. Learn to keep partner dancing an integral part of your life and enjoy as a form of exercise. Group 2 course.

PE 102 Hip-Hop Dance ............................. 1.0 (2)
Learn dance combinations used in the Hip-Hop dance style. Develops the strength, flexibility, rhythm, balance, and safe body mechanics to dance confidently in a social atmosphere to popular Hip-Hop music. A great way to exercise and have fun at the same time. Please wear clean, dry gym shoes. Group 2 course.

PE 102B Hip-Hop Dance II ............................. 1.0 (2)
Recommended prerequisite(s): PE 102
Learn advanced dance combinations building upon those used in Hip Hop Dance I. Further develops the strength, flexibility, rhythm, balance, and safe body mechanics to dance confidently in a social atmosphere to popular hip hop music. Group 2 course.

PE 105 Volleyball I ............................. 1.0 (2)
Introduction to volleyball with emphasis on developing individual ball-handling skills. Team play, basic strategy, and rules of play will also be covered. Group 2 course.

PE 106 Volleyball II ............................. 1.0 (2)
Recommended prerequisite(s): PE 105
A continuation for students who already have good basic skills and understand the game. Emphasis is on team play, offensive and defensive alignments, and advanced volleyball skills. Group 2 course.

PE 107 Basketball I ............................. 1.0 (2)
Introduction to the fundamental skills, rules, offensive and defensive team strategies of basketball. Designed for beginners through advanced levels. Drill practice and team play. Group 2 course.

PE 108 Basketball II ............................. 1.0 (2)
Recommended prerequisite(s): PE 107
A continuation for students who already have good basic skills and understand the game. Emphasis is on advanced offensive and defensive strategies as applied to a practical team play experience. Group 2 course.

PE 135 Weightlifting I ............................. 1.0 (2)
In this self-directed workout class, students will implement a weightlifting/fitness regime utilizing free weights, weight machines, and cardio machines to expand their strength and fitness. Students should have a basic working knowledge of the use of weights and fitness equipment including safety. Students should be without current exercise-limiting injuries or illnesses. Group 2 course.

PE 136A Weightlifting II ............................. 1.0 (2)
Recommended prerequisite(s): PE 135
Designed for students who wish to continue to build body size and muscular strength. This self-directed class uses free weights and fitness machines, as related to an advanced strength training and conditioning program. Group 2 course.

PE 138 Weightlifting With Machines ............................. 1.0 (2)
This on-campus weightlifting course enables the student to expand knowledge and use of weight machines. Course includes cardiovascular and strength training, with opportunity for questions and answers. Group 2 course.
PE 139  Beginning Aikido ............................................. 1.0  (2)
Aikido is Budo - an art based on the philosophy and fighting
techniques of the Japanese samurai. “The way of harmony
with the forces of nature,” Aikido is excellent physical training
and effective self-defense. Yoshinkai-style Aikido classes
include stretching, exercises to improve balance and focus,
learning to fall safely, throwing techniques, controls, and pins,
in a setting of traditional Japanese etiquette. **Group 2 course.**

PE 141  Aikido .................................................................... 1.0  (2)
Aikido is Budo - an art based on the philosophy and fighting
techniques of the Japanese samurai. “The way of harmony
with the forces of nature,” Aikido is excellent physical training
and effective self-defense. This course introduces
Yoshokai-style Aikido warmup exercises, basic movements,
back breakfall, and 8th kyu level techniques. The emphasis is
on improving balance and focus, learning to fall safely, and
performing basic techniques with a partner, while learning
about Aikido history, principles, and terminology in a setting
of traditional etiquette and discipline. **Group 2 course.**

PE 142  Intermediate Aikido .................................................. 1.0  (2)
**Recommended prerequisite(s): PE 141**
Refinement of Yoshokai-style Beginning Aikido skills with em-
phasis on mastering techniques and the introduction of bukiwa-
a, techniques using wooden sword, staff, knife. **Group 2 course.**

PE 143  Continuing Aikido .................................................. 1.0  (2)
**Recommended prerequisite(s): PE 142**
Training at this level emulates regular Aikido practice in a pri-
ivate dojo (training facility). Focus is on mastery of advanced
methods, weapons, and philosophy. **Group 2 course.**

PE 144  Tae Kwon Do (Karate) I ......................................... 1.0  (2)
Introduction to the proper etiquette and philosophy of the Kore-
an art of Tae Kwon Do (Karate). Training includes basic blocks,
punches, kicks, stances, defense and the four-directional
punch, the first pattern of Tae Kwon Do. **Group 2 course.**

PE 145  Tae Kwon Do (Karate) II ......................................... 1.0  (2)
**Recommended prerequisite(s): PE 144 or instructor permission**
Refinement of basic skills and techniques of Tae Kwon Do.
Training includes introduction of intermediate skills of block-
ing, kicking, punching, and Chon-ji, the second pattern of
Tae Kwon Do. **Group 2 course.**

PE 146  Tae Kwon Do (Karate) III ......................................... 1.0  (2)
**Recommended prerequisite(s): PE 145 or instructor permission**
Continuing refinement of basic and intermediate skills and
techniques. Introduction to advanced foot techniques, semi-
and free sparring, and the methods of attack and defense
against opponents. Training includes the patterns of Dan-
Gun, Do-San and Won-Hyo. **Group 2 course.**

PE 147  Tae Kwon Do (Karate) IV ......................................... 1.0  (2)
**Recommended prerequisite(s): PE 146 or instructor permission**
Introduction to jumping kicks and refinement of basic, inter-
mediate and semi-advanced skills and techniques. Introduction
to jumping kicks and the patterns of Yul-Guk, Joong-Gun,
Hwa-Rang, and Choong-Moo. Advanced flying kicks and addi-
tional patterns are introduced to those prepared to obtain Kick
Belt ranks and to instruct lower rank students. **Group 2 course.**

PE 148  Kuntaw I ................................................................. 1.0  (2)
Introduction to the history and philosophy of the Filipino
martial art form Maharlika Kuntaw. Kuntaw emphasizes flex-
ibility and agility rather than power or strength and is based
on the use of flowing circular strike/counter defense. Training
includes use of arnis (sticks), basic strikes, blocks, kicks, anyos
(forms) and self-defense. **Group 2 course.**

PE 149  Kuntaw II ................................................................. 1.0  (2)
**Recommended prerequisite(s): PE 148 or instructor permission**
This course provides the student with the continuation of
beginning I. The student will learn the application of the six
anyos (forms), stick drills, hand techniques, basic blocks,
kicks, stalls and traps. **Group 2 course.**

PE 150  Kuntaw III ................................................................. 1.0  (2)
**Recommended prerequisite(s): PE 149**
Continuation of course work with the addition of advanced
blocks, parries, kicks, stalls, traps, take downs, stick/weapon
drills, and self-defense. Training includes the five H-forms, the
six stick anyos (forms) and the applications. **Group 2 course.**

PE 151  Kuntaw IV ................................................................. 1.0  (2)
**Recommended prerequisite(s): PE 150**
Refinement of intermediate skills and techniques with ad-
ditional advanced blocks, parries, traps, take downs, ground
fighting, two-on-one fighting, and stick/weapon drills. In-
cludes applications of advanced skills/techniques and the six
saiawans and five combats (forms). **Group 2 course.**

PE 164  Judo ................................................................. 1.0  (2)
This class will introduce the basics of the sport of Judo as well as
Jujutsu based self defense. Judo is recognized as one of the
best forms of exercise. Actual combat (randori) is a big part
of Judo though safety is not compromised. Please wear loose,
comfortable clothing and come to have fun! **Group 2 course.**

PE 169  Continuing Judo ........................................................ 1.0  (2)
**Recommended prerequisite(s): PE 164**
A continuation of Judo for intermediate and advanced levels.
Students will continue to improve skills and abilities and
advance through belt testing. **Group 2 course.**
PHL 101 Introduction to Philosophy.................. 3.0 (3)
Recommended prerequisite(s): Completion of ENG 11/111 or placement into ENG 111
Introduction to Philosophy is an introduction to some of the major areas, ideas and thinkers of philosophy. Students will read selections from major philosophers in Western Philosophy as well as texts representing non-traditional or non-Western sources, such as Native American, Asian and Feminist thought. Students will also be introduced to some of the main problems and concepts in areas such as Epistemology, Metaphysics, Ethics and Aesthetics, as well as investigate other issues or movements such as Existentialism or Feminism. Group 1 course.

PHL 105 Critical Thinking.................................. 3.0 (3)
Recommended prerequisite(s): Completion of ENG 11/111 or placement into ENG 111
This course is about listening and reading and writing more effectively. Students learn ways to assess information and to form sound evaluative judgments about what is seen, heard, and read. Critical questions provide a structure for critical thinking that supports a continuing search for better opinions, decisions, or judgments. Exercises in understanding and composing logically-sound arguments are emphasized as well as knowing what is fair and reasonable in the argument's structure. Examples are taken from professional situations such as law, medicine, and politics, as well as everyday life. Fallacies in rhetoric, such as name calling and begging the question, are identified and understood. Group 1 course.

PHL 121 Western Religions................................. 4.0 (4)
Recommended prerequisite(s): Completion of ENG 11/111 or placement into ENG 111
A study of the historical development, main religious teachings, leading personalities, ethical values and worship practices of the major religious traditions of the Western world: Judaism, Christianity, and Islam. Group 1 course.

PHL 122 Eastern Religions................................. 4.0 (4)
Recommended prerequisite(s): Completion of ENG 11/111 or placement into ENG 111
A study of the historical development, main religious teachings, leading personalities, ethical values and worship practices of the major religious traditions of India, China, and Japan: Hinduism, Buddhism, Confucianism, Taoism. Group 1 course.

PHL 201 Ethics.............................................. 3.0 (3)
Recommended prerequisite(s): Completion of ENG 11/111 or placement into ENG 111
Ethics is a thoughtful analysis of a variety of value systems found in societies today. It explores the nature and meaning of good and evil and how these concepts relate to concepts of right and wrong. Through the use of critical judgment and philosophical thought, the course explores ethical theories from classical to modern times and includes consideration of ethics that are part of Eastern philosophical traditions, as well as sources from Native American, African, African-American, Feminist, and other non-traditional frameworks and paradigms. Group 1 course.

PHL 202 Contemporary Ethical Dilemmas........... 3.0 (3)
Recommended prerequisite(s): Completion of ENG 11/111 or placement into ENG 111
Contemporary Ethical Dilemmas examines the moral and ethical issues confronting modern societies locally and globally. Possible topics to be examined may include: the natural environment, the ethical treatment of animals, biomedical ethics; abortion and issues of human reproduction such as stem-cell research and cloning; business ethics; criminal justice and capital punishment; racism, sexism, and other forms of discrimination, welfare and economic distribution. This course relies on the discipline of philosophy for its methods of inquiry with critical thinking serving as a guiding concept. Traditional approaches to ethics will be incorporated throughout the course. Eastern/Asian and Native American philosophy may also be considered for contrast with standard western approaches to ethical and social issues. The course considers various topics and specific cases in order to provide an overall view of how ethical reasoning might be applied to current issues. Group 1 course.

PHY 105 Physics of the World Around Us........... 4.0 (4)
PHY 105L Physics of the World Around Us Lab........ 0.0 (2)
Required prerequisite(s): MTH 23
Recommended prerequisite(s): Students scoring below ENG 111 level on the placement test should plan on additional study time Corequisite(s): PHY 105 and PHY 105L
This course is an introduction to the fundamental principles developed by mankind to describe the physical universe. In particular, the subjects of mechanics, heat, electricity and magnetism, waves, and light are surveyed. The development of conceptual understanding and critical-thinking skills is emphasized. Computers are used for data acquisition and analysis. Group 1 lab course.

PHY 121 General Physics I............................... 4.0 (4)
PHY 121L General Physics I Lab.......................... 0.0 (2)
Required prerequisite(s): MTH 122 or MTH 140 Corequisite(s): PHY 121 and PHY 121L
This is the first course in a two semester sequential course intended to meet the needs of the prospective pre-medical, pre-dental, technical, architecture, or any other student who has a keen interest in examining some of the basic laws and applications of physics, using college algebra and trigonometry. This course deals with mechanics, sounds, thermodynamics and fluids. The lab portion is designed to illustrate and reinforce the basic concepts of physics while familiarizing the student with laboratory hardware and the experimental nature of physics. Group 1 lab course.
PHY 222  General Physics II ......................... 4.0 (4)
PHY 222L General Physics II Lab ................... 0.0 (2)

**Required prerequisite(s):** PHY 121

**Corequisite(s):** PHY 122 and PHY 122L

A continuation of PHY 121. Topics include material properties, electric charges and fields, current, Ohm’s Law, resistors, capacitors, RC circuits, DC and AC circuits including multi branch circuits, magnetism, generation and transmission of electricity, household circuits, electrical safety, EM waves, and optics including the human eye. **Group 1 lab course.**

PHY 221  Probs. & Principles of Physics I .......... 4.0 (3)
PHY 221L Probs. & Principles of Physics I Lab .... 0.0 (2)
PHY 221R Probs. & Prin. of Physics I Rec ........... 1.0 (2)

**Required prerequisite(s):** MTH 141, may be taken concurrently

**Corequisite(s):** PHY 221, PHY 221L and PHY 221R

**Recommended prerequisite(s):** ENG 111, may be taken concurrently

This course is the first semester of a two-semester course sequence primarily intended for those students preparing for engineering, science or math careers. Topics include kinematics, Newton’s Law, conservation of momentum, conservation of energy, rotational motion, oscillations, and fluids. The development of conceptual understanding and problem solving skills is emphasized. Computers are used for data acquisition and analysis. The laboratory covers preceding topics in parallel with the lecture whenever possible. **Group 1 lab course.**

PHY 222  Probs. & Principles of Physics II .......... 4.0 (3)
PHY 222L Probs. & Principles of Physics II Lab .... 0.0 (2)
PHY 222R Probs. & Prin. of Physics II Rec .......... 1.0 (2)

**Required prerequisite(s):** PHY 221

**Corequisite(s):** PHY 222, PHY 222L and PHY 222R

This course is a continuation of PHY 212. Topics include thermodynamics, waves, electricity, electric circuits, magnetism and optics. The laboratory covers the preceding topics in parallel with the lecture whenever possible. The development of conceptual understanding and problem solving skills is emphasized. **Group 1 lab course.**

Visit [www.nmc.edu/science-math](http://www.nmc.edu/science-math) for detailed information.

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**PLS 101  Intro to American Politics.................. 3.0 (3)**
**Recommended prerequisite(s):** Placement into ENG 111

This course is an introduction to the study of politics and political institutions in America. Emphasis is given to the constitutional framework, federalism, political participation, the electoral system, the presidency, Congress, the Supreme Court, and the bureaucracy. Civil rights and civil liberties are a theme throughout. This course includes an examination of the politics of race, and ethnic and cultural diversity in America. **Group 1 course.**

**PLS 132  Comparative Politics ....................... 3.0 (3)**
**Recommended prerequisite(s):** Placement into ENG 111

This course provides a comparative analysis of political systems in developed and developing countries. Students learn about different forms of political organization as instituted and practiced in various countries. Students examine different methods of comparing political systems and learn to apply these methods in causal theories of political change. This course combines a focus on the basic structures of political systems with thought-provoking analysis of the causes that give birth to those systems and the consequences these systems have for people the live within them. Issues related to democracy, civil liberties, political rights, human rights, and economic development are analyzed throughout the course. **Group 1 course.**

**PLS 211  International Relations ..................... 3.0 (3)**
**Recommended prerequisite(s):** Placement into ENG 111

Students analyze the nature of international relations and global politics today. This course offers a broad overview of political and economic issues in the international arena. Students assess the dynamics of conflict and cooperation through various case studies and analyses. Topics include such things as conflict in the Middle East, ethnic conflict and nationalism the world over, the threat of global terrorism in the 21st century, the rise of China as an assertive world power, the increasing importance of organizations such as the United Nations and the World Trade Organization, cultural and economic globalization, and global ecological issues. Course includes an examination of the basic analytical approaches to the study of international relations. **Group 1 course.**

**PLS 222  Intro to Political Theory .................. 3.0 (3)**
**Recommended prerequisite(s):** Placement into ENG 111

Introduction to Political Theory examines the foundational questions of normative political theory as developed by political philosophers of the ancient through contemporary periods. The course focuses on a wide array of political and ethical issues. Topics of consideration include: the rights of the individual v. the rights of the community; the nature of human equality and the reality of human inequalities; conceptions of justice put forth by various philosophers; and questions of what it means to achieve freedom in one’s social and political life. Students can expect to read almost exclusively from primary sources. Examples of thinkers studied in this course include Plato, Aristotle, Machiavelli, Hobbes, Locke, Rousseau, Kant, Marx, Mill, Nietzsche, Arendt, and Rawls. **Group 1 course.**
PLU 101  Introduction to Plumbing .............................. 3.0 (4)
Recommended prerequisite(s): PLU 101
This course provides an introduction to plumbing. Through structured classroom and hands-on skill building, the student will learn the tools of the trade, plumbing safety, how to solder and braze copper tubing, piping skills and trade mathematics. Group 2 course.

PLU 105  Plumbing Components ................................. 3.0 (4)
PLU 101
Through structured classroom and hands-on skill building, the student will learn to work with copper pipe and fittings, cast-iron pipe and fittings, carbon steel pipe and fittings, corrugated stainless steel tubing, fixtures and faucets, drain waste and vent systems and water distribution systems. Group 2 course.

PLU 121  Commercial Plumbing ................................. 3.0 (4)
PLU 105
Through structured classroom and hands-on skill building, the student will learn to read commercial drawings, hangers, supports, structural penetrations, and fire stopping, installation and testing DWV piping. Group 2 course.

PLU 125  Plumbing Installation ................................. 3.0 (4)
PLU 121
Through structured classroom and hands-on skill building, the student will learn installation of roof, floor, and drain areas, types of valves, installing and testing water supply piping, installing fixtures, valves, and faucets, basic electricity, installing water heaters, fuel gas systems and servicing plumbing fixtures. Group 2 course.

PLU 135  Plumbing Systems and Pumps .................. 3.0 (4)
PLU 131
Through structured classroom and hands-on skill building, the student will learn sizing DWV and storm systems, sewage pumps and sump pumps, corrosive-resistant waste piping and compressed air. Group 2 course.

PSY 100  Career Exploration & Planning ................ 1.0 (1)
This course is designed to introduce the student to career and life planning theories and concepts and assist in applying these principles to their own lives. A variety of techniques will be used to accomplish this including activities on self-assessment of skills, values, interests, personality, and preferences; small group discussions; and written assignments. Development of goal-setting and decision-making skills will be included to enable the student to take charge of their career direction with known information. Group 1 course.

PSY 101  Introduction to Psychology ....................... 3.0 (3)
This course provides a broad, general introduction to psychology, its basic subject matter, and its approaches to gathering and evaluating evidence about the causes and correlates of behavior. It includes: a) awareness of major psychological approaches to the study of the behavior of organisms; b) knowledge of its important contributors; c) knowledge of research findings, and concepts; and d) understanding of its methodology and limitations. Group 1 course.

PSY 211  Developmental Psychology ....................... 3.0 (3)
This course presents human development from conception to death including the historical and anthropological bases for studying development. The course includes hereditary factors as well as physical, social and emotional, linguistic, intellectual, and personality development. Group 1 course.

PSY 212  Psychology/Exceptional Child .................. 3.0 (3)
Recommended prerequisite(s): CD 202 or PSY 101
This course will provide an examination of the atypical child and his or her developmental needs, including the family. Areas covered will include characteristics, identification processes, methods for contributing to the child’s healthy development and educational needs, community resources and referral procedures. The course will include the child with sensory, physical and speech impairments. The gifted child’s development will also be explored. Group 1 course.
PSY 221  Psychology of Personality .................. 3.0 (3)
Required prerequisite(s): PSY 101
This course provides a presentation of the concepts, perspectives and terminology of major theorists in the field of personality psychology, as students explore the many psychological, physiological, social and cultural factors that affect personality development. Students are encouraged to evaluate personality theories in relation to current research and application. Group 1 course.

PSY 223  Intro to Social Psychology .................. 3.0 (3)
Required prerequisite(s): PSY 101 or SOC 101
This course is an introduction to social psychology theory and research. It covers the individual in the social context including how we perceive, judge, and are influenced by others. Topics such as conformity, attraction, liking, prejudice, attitudes, aggression, helping behavior, and interpersonal power are covered from a social psychological perspective. Group 1 course.

PSY 225  Human Sexuality .............................. 3.0 (3)
Required prerequisite(s): PSY 101
Recommended prerequisite(s): Placement into ENG 111
Human Sexuality offers an introduction to all facets of the field, and involves discussions of theory, research, and practical information. The purpose of the course will be to develop a critical awareness of the dominant issues in the field and to refine the student's sense of sexual responsibility and integrity. This will be accomplished by exploring the biological, social, cultural, psychological, and personal elements of sexuality. Group 1 course.

PSY 231  Psychology of Adjustment .................. 3.0 (3)
Recommended prerequisite(s): SOC 101, placement into ENG 111
First, this course will provide the student with a broad introduction to the psychology of adjustment which investigates the processes involved in the dynamic interactions of the individual with his or her environment. Second, this course is designed to present procedures by which the student can harness the principles of learning and rational self-counseling in order to achieve personal goals. Group 1 course.

PSY 250  Abnormal Psychology ....................... 3.0 (3)
Required prerequisite(s): PSY 101
Recommended prerequisite(s): Placement into ENG 111
In this course students will create a working vocabulary of the basic concepts of psychopathology, critically analyze theories and therapies, develop empathy toward the mentally ill and their families, and uncover strategies for living emotionally healthy lives. They will communicate their understanding in a variety of ways and develop strategies for self-assessment of progress toward course outcomes. Group 1 course.

RAM  Robotics and Automation

RAM 120  Robotics and Automation I .................. 3.0 (4)
Required prerequisite(s): CIT 110, EET 103
This course provides an introduction to sensors, actuators, robotics and automation. Students will extend concepts from prior electronics and programming courses to design and build robotic and automated systems. Students will complete a design project including design, prototype, test, and release phases. This course will also expose students to contemporary topics in robotics research, applications, and contests. Note: This course is a “Bring Your Own Device” (BYOD) course. Students must have a Windows Laptop. Software is provided. Group 2 course.

RAM 150  Robotics and Automation II .................. 3.0 (4)
Required prerequisite(s): RAM 120
This course is a continuation of Robotics and Automation I. Students will utilize more complex sensors, actuators, and interfaces to create automated solutions. Projects will feature distributed systems that communicate via the Internet, enabling remote sensing and control. Note: This course is a “Bring Your Own Device” (BYOD) course. Students must have a Windows Laptop. Software is provided. Group 2 course.

SOC  Sociology

SOC 101  Introduction to Sociology .................. 3.0 (3)
Recommended prerequisite(s): Placement into ENG 111
This course is an introduction to the study of human group behavior through social interaction with special emphasis on culture, the socialization process, social stratification, collective behavior, social institutions, and social change. Group 1 course.

SOC 201  Modern Social Problems ...................... 3.0 (3)
Recommended prerequisite(s): Placement into ENG 111
This course presents an introductory sociological analysis of causes, changes in, and attempts to effectively treat some of the major problems in contemporary American society. These include: hunger, environmental problems, poverty, crime and delinquency, family problems, and homelessness. Community involvement projects are encouraged. Group 1 course.

SOC 211  Marriage & the Family ....................... 3.0 (3)
Recommended prerequisite(s): SOC 101, placement into ENG 111
This course covers topics such as traditional and non-traditional families, love and intimacy, sexuality, marriage, parenting, family problems and aging. The concept of healthy human relationships in a partnership, and how to build and maintain them, is stressed. Group 1 course.
SOC 220 Gender & Society .................................................. 3.0 (3)
Recommended prerequisite(s): PSY 101 or SOC 101
This course examines gender as a system of stratification.
It approaches issues of gender in society from both a social,
structural, and a social psychological perspective. Issues related
to gender inequality in selected institutions such as economy,
family, media, education, and politics are studied. Group 1 course.

SOC 221 Russian Language and Culture .............. 4.0 (4)
The class includes both classroom work in Russian language
and culture as well as excursions and cultural experiences in
Russia. The cultural component is designed to provide stu-
dents with a context through which they will be able to under-
stand and process new cultural information. Students will gain
practical language skills that will be utilized during the time
in Russia. The approach is interdisciplinary and will include
units on economics, politics, history, music, architecture, and
literature. Group 1 course.

SPN 227A Spanish for Environmental Mgmt.........3.0 (3)
Recommended prerequisite(s): The following Intermediate and/or
Low-level Spanish competencies are recommended:
• Listening Skills: able to understand sentence-length utterances
  which consist of recombination of learned elements in a limited
  number of context areas, particularly if strongly supported by the
  situational context.
• Reading Skills: able to understand main ideas and/or some facts
  from the simplest connected text that deal with reading about basic
  personal and social needs.
• Speaking Skills: able to handle successfully a limited number of
  uncomplicated communicative tasks by creating with the language
  in straightforward social situations.
• Writing Skills: able to meet limited practical writing needs.
SPN 227A focuses on global environmental issues as an entry
point for further development of Spanish technical vocabulary,
conversational skills and global competencies. Through an
exploration of current freshwater issues in Spanish-speaking
countries, and an experience studying overseas, students will
address relevant issues concerning environmental resource man-
agement, and engage in community projects. Group 1 course.

SPN 201 Intermediate Spanish I ............................4.0 (4)
Required prerequisite(s): SPN 102 with 2.0 or higher, required
score on NMC language placement test or instructor permission.
Recommended prerequisite(s): You will be required to read, write,
listen and speak in Spanish. You will need a minimal ability us-
ing technology to take advantage of outside-of-class requirements.
SPN 201 is designated to further develop language proficiency
in reading, writing, listening, and speaking. A deeper explo-
ration of Hispanic culture is presented in this course allowing
students to transform themselves into truly active and profi-
cient language users. Group 1 course.

SPN 202 Intermediate Spanish II ..........................4.0 (4)
Required prerequisite(s): SPN 201 with 2.0 or higher, required
score on NMC language placement test or instructor permission.
Recommended prerequisite(s): You will be required to read, write,
listen and speak in Spanish. You will need a minimal ability us-
ing technology to take advantage of outside-of-class requirements.
SPN 202 is a continuation of SPN 201 and focuses on the
application of the communication skills of reading, writing,
listening, and speaking within cultural contexts. Group 1 course.

SPN 101 Elementary Spanish I ..............................4.0 (4)
Recommended prerequisite(s): You will be required to read, write,
listen and speak in Spanish. You will need a minimal ability us-
ing technology to take advantage of outside-of-class requirements.
This course represents a comprehensive introduction to the
Spanish language for the true beginner. Students will develop
the ability to communicate in Spanish in everyday practical
situations while acquiring some of the necessary skills for
reading, writing, listening, and speaking. Cultural topics are
integrated in each unit. Group 2 course.

SPN 102 Elementary Spanish II ............................4.0 (4)
Required prerequisite(s): SPN 101 with 2.0 or higher, required
score on NMC language placement test or instructor permission.
Recommended prerequisite(s): You will be required to read, write,
listen and speak in Spanish. You will need a minimal ability us-
ing technology to take advantage of outside-of-class requirements.
SPN 102 is a continuation of SPN 101 and focuses on the
expansion of the communication skills of reading, writing,
listening, and speaking. Cultural topics are integrated into
each unit. Group 2 course.

SPN 201 Intermediate Spanish I ............................4.0 (4)
Required prerequisite(s): SPN 102 with 2.0 or higher, required
score on NMC language placement test or instructor permission.
Recommended prerequisite(s): You will be required to read, write,
listen and speak in Spanish. You will need a minimal ability us-
ing technology to take advantage of outside-of-class requirements.
SPN 201 is designated to further develop language proficiency
in reading, writing, listening, and speaking. A deeper explo-
ration of Hispanic culture is presented in this course allowing
students to transform themselves into truly active and profi-
cient language users. Group 1 course.

SPN 202 Intermediate Spanish II ..........................4.0 (4)
Required prerequisite(s): SPN 201 with 2.0 or higher, required
score on NMC language placement test or instructor permission.
Recommended prerequisite(s): You will be required to read, write,
listen and speak in Spanish. You will need a minimal ability us-
ing technology to take advantage of outside-of-class requirements.
SPN 202 is a continuation of SPN 201 and focuses on the
application of the communication skills of reading, writing,
listening, and speaking within cultural contexts. Group 1 course.

SPN 227A Spanish for Environmental Mgmt.........3.0 (3)
Recommended prerequisite(s): The following Intermediate and/or
Low-level Spanish competencies are recommended:
• Listening Skills: able to understand sentence-length utterances
  which consist of recombination of learned elements in a limited
  number of context areas, particularly if strongly supported by the
  situational context.
• Reading Skills: able to understand main ideas and/or some facts
  from the simplest connected text that deal with reading about basic
  personal and social needs.
• Speaking Skills: able to handle successfully a limited number of
  uncomplicated communicative tasks by creating with the language
  in straightforward social situations.
• Writing Skills: able to meet limited practical writing needs.
SPN 227A focuses on global environmental issues as an entry
point for further development of Spanish technical vocabulary,
conversational skills and global competencies. Through an
exploration of current freshwater issues in Spanish-speaking
countries, and an experience studying overseas, students will
address relevant issues concerning environmental resource man-
agement, and engage in community projects. Group 1 course.

SPN 101 Elementary Spanish I ..............................4.0 (4)
Recommended prerequisite(s): You will be required to read, write,
listen and speak in Spanish. You will need a minimal ability us-
ing technology to take advantage of outside-of-class requirements.
This course represents a comprehensive introduction to the
Spanish language for the true beginner. Students will develop
the ability to communicate in Spanish in everyday practical
situations while acquiring some of the necessary skills for
reading, writing, listening, and speaking. Cultural topics are
integrated in each unit. Group 2 course.

SPN 102 Elementary Spanish II ............................4.0 (4)
Required prerequisite(s): SPN 101 with 2.0 or higher, required
score on NMC language placement test or instructor permission.
Recommended prerequisite(s): You will be required to read, write,
listen and speak in Spanish. You will need a minimal ability us-
ing technology to take advantage of outside-of-class requirements.
SPN 102 is a continuation of SPN 101 and focuses on the
expansion of the communication skills of reading, writing,
listening, and speaking. Cultural topics are integrated into
each unit. Group 2 course.
### SWK Social Work

#### SWK 121 Introduction to Social Work .......... 2.0 (2)
- **Recommended prerequisite(s):** ENG 11/111 or ENG 111
- **Corequisite(s):** SWK 170

In this class we will gain basic knowledge about the varying and diverse areas of social work including the health care systems, rural and urban settings, criminal justice systems, systems that work with the elderly, various private and public agencies and schools. We will explore and build an understanding of client populations who may be in need of social work services. In addition, we will assess our own experiences, interests and knowledge that may guide us in the field of social work. **Group 2 course.**

#### SWK 170 Service Internship Orientation ........ 1.0 (1)
- **Recommended prerequisite(s):** ENG 11/111 or ENG 111
- **Corequisite(s):** SWK 121

Orientation and preparation for introductory internship experiences in social work areas. For example, introduction to use of supervision, supervisory evaluation, self-evaluation and varying agency structures and functions. Opportunities for internships will also be introduced. This course is done in class and seminar format. **Group 2 course.**

#### SWK 211 Social Interviewing Skills ............... 3.0 (3)
- **Recommended prerequisite(s):** ENG 11/111 or ENG 111, SWK 121, SWK 170

Introduction to types, purposes and stages of interviewing. Basic empathy skill development will be for observation, listening, non-verbal communications, rapport building, information giving and information gathering. Beginning training in recording and documentation. Emphases will be on self-monitoring and working with culturally diverse, oppressed or psychologically maladaptive clients. In addition, we will explore building relationships with clients that is focused on the strengths of the client. **Group 2 course.**

#### SWK 221 Introduction to Social Welfare .......... 3.0 (3)
- **Required prerequisite(s):** SWK 121, SWK 170
- **Recommended prerequisite(s):** PLS 101, placement into ENG 11/111 or ENG 111

This course explores the historical development of social welfare in the United States, how it has defined social services and implications of they have had on society today. It also reviews modern social welfare systems and the existing attitudes, philosophies and the implications of economic, political and cultural conditions. Varying major theories of behavior are also explored as they relate to social work and the clients in need of services. The course also explores the importance of social workers in social action through understanding the different political perspectives influencing the formation of welfare policy. **Group 2 course.**

#### SWK 290 Social Work Internship ............... 3.0 (3)
- **Required prerequisite(s):** SWK 121, SWK 170
- **Recommended prerequisite(s):** SWK 211

This course helps to prepare students for the generalist practice in the field of social work. This is a field instruction course that students will engage in direct practice of social work education. Students will complete 120 hours in a human service agency. This placement will provide an opportunity to observe social workers while they work, as well as assisting in general service delivery under close supervision. Students must complete the 120 hours in one semester. **Group 2 course.**

### VCA Visual Communications/Art

#### VCA 100 Materials and Techniques ............... 3.0 (4)
- **Recommended prerequisite(s):** ART 121

This course introduces students to commercial drawing techniques, with an emphasis on perspective, pen & ink, and color techniques in marker and pencil when illustrating a variety of different products and illustration formats. Creative media experimentation is encouraged through the assignments. **Group 2 course.**

#### VCA 125 Typography I ............... 3.0 (4)
- **Required prerequisite(s):** VCA 150
- **Recommended competence(s):** Intermediate keyboarding skills, intermediate to advanced understanding of vector drawing, desktop publishing software and the Macintosh system.

This course serves as an introduction to typographic history, letterforms, mechanics, terminology and usage. Students will complete projects that lead them to an understanding of the fundamental and technical aspects of this abstract art including font selection and typesetting. As part of this course students will also learn the basics of Adobe InDesign, desktop publishing software used to create single and multi-page files, format text using style sheets, manage color, import and create graphics and tables and prepare files for print production. The Adobe Certified Associate Exam for InDesign is included in the cost for this course. **Group 2 course.**
VCA 126  Typography II ........................................... 3.0 (4)
Required prerequisite(s): VCA 125
This class serves as continuation to typographic history, trends, display faces and grids with an emphasis on book typography, binding and structuring methods. Students will complete projects that lead them to an understanding of intermediate typography, current typographic trends and comparative analysis of typefaces that relate to the field of Visual Communications as well as print and electronic media. Group 2 course.

VCA 127  Digital Imaging ........................................... 3.0 (4)
In this course you will learn Adobe Photoshop, a photo manipulation tool used to create images for both print and the web. You will learn how to use layers, effects, filters, masks and selection techniques for proper image editing. You will also learn how to incorporate type and vector objects into bitmap layouts. In addition, you will learn about color management, using various tools to restore damaged images, automating tasks, and choosing the proper color space for print and web applications. The basics of using a digital camera and scanner and the rights management of images will also be covered. Group 2 course.

VCA 146  Interactive Animation ................................. 3.0 (4)
Required prerequisite(s): VCA 127, VCA 150
Recommended Prerequisite(s): VCA 125
This course’s focus will be on creation of animation using both traditional methods and Adobe Flash software. You will learn the basics of animation and storytelling, file management and organization, as well as interactive navigation using ActionScript, the programming language used in Adobe Flash. You will also learn how to incorporate sound and video in projects and learn how to prepare their files for use on the web. Group 2 course.

VCA 147  Web Design I ............................................. 3.0 (4)
Required prerequisite(s): VCA 127, VCA 150 or instructor permission
Recommended prerequisite(s): VCA 125
This course focuses on creative website design including site planning, interactive navigation, information design theory, typography and user experience. Basic principles of Dreamweaver software will be introduced along with conceptual overviews of HTML, CSS, and WordPress. Students will have gained a holistic understanding of both the process and core principles of interaction design, exploring the roles of web developers, programmers, and designers as well as how to collaborate in a team. Group 2 course.

VCA 150  Digital Graphic Design I ......................... 3.0 (4)
Recommended Prerequisite(s): CIT 100
This course covers the basics of using Adobe Illustrator to create vector objects and layouts for print and interactive environments. Students will learn how to create and manipulate shapes, work with type, color, gradients, fills and strokes. Students will learn how to work with spot and process colors, create die lines for packaging and other basic design principles. Students will also learn to prep files for print and choose the correct color space for various applications. The Adobe Certified Associate Exam for Illustrator is included in the cost for this course. Group 2 course.

VCA 200  Visual Communications II ...................... 3.0 (4)
Required prerequisite(s): VCA 126
Recommended prerequisite(s): ENG 112
Corequisite(s): VCA 220
Through this course you will gain insight and introduction to the theory of graphic design through practice in researching, brainstorming, creative problem solving, comping, design brief writing and production of print and digitally driven graphic projects like logo marks, identity developments, posters, collateral and greeting cards. Students embrace print and digital pre-production techniques and receive constructive criticism of work and practice. Survey of History of Graphic Design shapes the research and development. Group 2 course.

VCA 220  Visual Communications III ...................... 3.0 (4)
Required prerequisite(s): VCA 126
Recommended prerequisite(s): ENG 112
Corequisite(s): VCA 200
Through this course, you will gain insight and introduction to the theory of Advertising Design and Art Direction through practice in researching, brainstorming, marketing, creative problem solving, copywriting and editorial planning of print and digital advertising, advertising campaigns, television story boards and product branding. Traditional and digital best practices will be explored as you work on campaign voice and receiving/giving constructive criticism using industry terminology. Group 2 course.

VCA 225  Visual Communications Studio ................ 3.0 (4)
Required prerequisite(s): ART 112, ART 132, VCA 200, VCA 220
Corequisite(s): VCA 200
By the end of this course, you will have participated in two hands-on “real world” design projects in which you will act as copywriter, art director, designer, filmmaker, photographer or illustrator. Service learning projects are for various regional not-for-profit clients. You will learn all aspects of pre-press work, digital workflow, production, and printing via field trips to area service providers and professionals while also learning to work with clients and the self-driven responsibilities of team work. Group 2 course.

VCA 230  Visual Communications V .......................... 3.0 (4)
Required prerequisite(s): VCA 200, VCA 220 or instructor permission
In this course you will excel in setting occupational/educational aspirations and offering/receiving constructive criticism of your work. You will design and produce a body of work for your portfolio, tailored to your individual goals, be it in Illustration, Graphic Design, Motion Graphics or Art Direction. Progressive Visual Communications theory and practice will also be studied through projects in Packaging Design, Point of Purchase Displays, Info-graphics, Mobile App. Development, and more. Group 2 course.
VCA 235  Visual Communications Portfolio …… 3.0 (4)
Required prerequisite(s): VCA 200, VCA 220
Students explore various methods of preparing professional portfolios, as well as the packaging and marketing of their portfolio works in preparation for further education and/or job interviews related to their career goals in visual communications. Along with the portfolio, each student prepares a resume, digital portfolio and considers other self-promotional pieces to complete the portfolio package. The emphasis of this course is that each student compiles a professional looking and complete portfolio package based on his/her occupational and educational goals. Group 2 course.

VCA 246  Interactive Animation II ………… 3.0 (4)
Required prerequisite(s): VCA 146
This course will focus on the advanced exploration of interactive navigation, animation and storytelling that is created for and exists on the web. Advanced Design theory, greater interactivity, file architecture, web loading, hosting and uploading for FLASH and more exposure to Motion software will emphasize creative and narrative language. Students should be self-motivated; this advanced section involves independent projects. Group 2 course.

VCA 247  Web Design II ………….. 3.0 (4)
Required prerequisite(s): VCA 147
This course will focus on more advanced creative website development and design including site planning, with a stress on information design theory, and user experience. More developed principles of HTML, CSS, and Wordpress along with continuing work with Dreamweaver and Fireworks software that emphasizes creative and utilitarian website construction. Students should be self-motivated, this advanced section involves independent solo projects or collaborative projects with other academic areas. Group 2 course.

VCA 250  Time Based Media I ………… 3.0 (4)
Required prerequisite(s): VCA 124
Recommended prerequisite(s): VCA 125
A multisensory, theory driven exposure and exploration of time-based visual communication environments. The role of typography, image, sound, space, luminosity, and narrative are assessed and used to create sequences of film and moving image. Students are exposed to tools, theories, aesthetics and techniques used in film editing medium.

VCA 252  Time Based Media II …………. 3.0 (4)
Recommended prerequisite(s): VCA 250
or instructor permission
A multisensory, theory driven continuation and exploration of time-based visual communication environments. The role of motion graphics, sound design, promo films and narrative are assessed and used to create more advanced sequences of moving image. Students are exposed to advanced tools, theories, aesthetics and techniques used in film editing medium using Final Cut Pro X 10.1 and Motion. Students should be self-motivated; this advanced section involves independent projects. Group 2 course.

VCA 290  Visual Communications Internship …… 3.0 (4)
Required prerequisite(s): Students must have completed all VCA courses with a minimum 2.5 GPA and departmental approval.
This course is required for the Associate of Applied Science degree in Creative Management in Art Direction. The purpose of the internship is to provide on-the-job experience for the student who wished to pursue a career in visual communications. The internship will be customized to meet the learning needs of the student and the job requirements of the sponsoring firms. Students spend 15 hours per week in this paid or non-paid, supervised on-the-job training experience. In addition to the required 180 hours in a graphic design business site, students participate in bi-weekly reports and weekly online discussion boards with instructor. Students must apply one month prior to the semester in which they will complete the internship.

WPT  Welding Process Technology

WPT 110  Oxy-Fuel Process ………………… 3.0 (5)
This course is designed for Welding students pursuing job skills or transferring into a Welding degree program. Topics include oxyacetylene welding in the flat, horizontal and vertical positions; oxyacetylene cutting, and oxyacetylene brazing. Students learn safety and theory as well as develop their proficiency in these operations. Group 2 course.

WPT 120 GTAW (TIG)  Welding I ……….. 2.0 (3)
Required prerequisite(s): WPT 100 or WPT 110
This course provides the student with the opportunity to learn and apply the theory of basic Gas Tungsten Arc Welding (GTAW) welding techniques on ferrous and non-ferrous metals in the flat and horizontal positions. Group 2 course.

WPT 121 GTAW (TIG)  Welding II ……….. 2.0 (3)
Required prerequisite(s): WPT 120
This course provides students the opportunity to learn and apply welding techniques using the Gas Tungsten Arc Welding (GTAW) process on ferrous and non-ferrous metals on advanced joint designs and in the vertical position. Group 2 course.

WPT 130 SMAW (Arc)  Welding I ………… 3.0 (5)
This course is designed for students pursuing job skills or transfer into a Welding degree program. Students learn theory and application of safe Shielded Metal Arc Welding (SMAW) in the flat and horizontal positions. They develop skills with “fast freeze” and “low hydrogen” type electrodes. Topics include electrode terminology, electrical theory as it relates to SMAW, weld defects and quality, and the American Welding Society SMAW filter material numbering system. Group 2 course.
**WPT 131 SMAW (Arc) Welding II** .................................. 3.0 (5)
*Required prerequisite(s): WPT 130*
This course provides the student with advanced theory and application of Shielded Metal Arc Welding (SMAW) techniques in flat, horizontal and vertical positions using “fast freeze” and “low hydrogen” electrodes. Topics include weld quality, inspection, power sources, and trouble shooting. **Group 2 course.**

**WPT 140 GMAW (MIG) Welding I** ....................... 2.0 (3)
This course provides the student an opportunity to learn the theory and application of basic Gas Metal Arc Welding (GMAW) techniques on ferrous metals. **Group 2 course.**

**WPT 141 GMAW (MIG) Welding II** ....................... 2.0 (3)
*Required prerequisite(s): WPT 140*
This course provides students the opportunity to learn and apply safe welding techniques using the Gas Metal Arc Welding (GMAW) process on ferrous and non-ferrous metals on advanced joint designs and welding positions. **Group 2 course.**

**WPT 142 Flux Cored Arc Welding** ....................... 2.0 (3)
*Required prerequisite(s): WPT 140*
This course provides students the opportunity to learn and apply safe welding techniques using the Flux Cored Arc Welding (FCAW) process. **Group 2 course.**

**WPT 160 Weld. Qualification Prep-SMAW** ........ 2.0 (3)
*Required prerequisite(s): WPT 131*
This course provides experienced welders/students the opportunity to take the AWS welder qualification tests in Shielded Metal Arc Welding (SMAW). **Group 2 course.**

**WPT 160A Weld. Qualification Prep-GMAW** ........ 2.0 (3)
*Required prerequisite(s): WPT 141*
This course provides experienced welders/students the opportunity to take the AWS welder qualification tests in Gas Metal Arc Welding (GMAW). **Group 2 course.**

**WPT 160B Weld. Qualification Prep-GTAW** ........ 2.0 (3)
*Required prerequisite(s): WPT 121*
This course provides experienced welders/students the opportunity to take the AWS welder qualification tests in Gas Tungsten Arc Welding (GTAW). **Group 2 course.**

**WPT 160C Weld. Qualification Prep-FCAW** ........ 2.0 (3)
*Required prerequisite(s): WPT 142*
This course provides experienced welders/students the opportunity to take the AWS welder qualification tests in Flux Cored Arc Welding (FCAW). **Group 2 course.**

**WPT 160D Weld. Qualification Prep-Other** .......... 2.0 (3)
This course provides experienced welders/students the opportunity to take the AWS welder qualification tests (other than GTAW, GMAW, SMAW, or FCAW) in specified processes on specified materials in specified positions. **Group 2 course.**

**WPT 210 Welding Fabrication and Repair** ........... 3.0 (5)
*Required prerequisite(s): WPT 121, WPT 131, WPT 141, WPT 142*
This course provides students an opportunity to apply the process of specific welding skills that they have previously mastered, to complete fabrication and repairs projects. Students also learn shop metal identification, how to setup and operate shop metal prep and fabricating equipment, as well as plan, sketch, order and prepare for a variety of projects. **Group 2 course.**

**WPT 290 Welding Internship** ....................... 2.0-4.0 (2-4)
*Required prerequisite(s): 20 credits of program specific courses with a GPA of 3.0 or higher*
The purpose of the internship is to provide on-the-job training for the student who wishes to pursue a career in a technical field of study. The internship will be customized to meet the learning needs of the student and the job requirements of the sponsoring firm. Students spend 10-15 hours per week in this paid, supervised on-the-job training experience. In addition to the required 50 hours per credit at a work site, students participate in semi-monthly seminars. Students must apply one month prior to the semester in which they will complete the internship. **Group 2 course.**

**WSI Water Studies**

**WSI 105 Intro to Freshwater Studies** ............. 3.0 (3)
*Recommended prerequisite(s): MTH 23; ENG 111 may be taken concurrently*
This course is designed to provide an exploration to the field of water studies, with specific focus on freshwater. The students will discuss the impact of water related challenges and opportunities in the context of the Great Lakes of the World. Focus will be given to the new and emerging career and educational pathways associated with water resources and their management. In addition to regular class lectures, invited experts from business, education and community organizations will introduce relevant topics of local and global significance including policy, law, sustainable development, history, engineering, health, and commerce. **Group 2 course.**

**WSI 200 GL Research Technologies** .............. 3.0 (4)
*Recommended competence(s): Ability to work/learn aboard R/V Northwestern and in the field. Completion of MTH 111 and ENG 111 or equivalent COMPASS scores. Advancements in Great Lakes research and monitoring techniques allow for an increased ability to access and assess remote locations through the use of enabling technologies and platforms including: Research Vessels, Remotely Operated Vehicles (ROV), SONAR systems (single beam, multibeam, scanning) and oceanographic buoy systems. Focus will be directed at understanding the basics of how each component is used and gain firsthand experience operating systems and collecting information. Field activities will take place in local water bodies, Grand Traverse Bay and onboard the R/V Northwestern. **Group 2 course.**
WSI 210 Underwater Acoustics and Sonar ............... 3.0 (4)

Required prerequisite(s): MTH 111
Recommended prerequisite(s): PHY 105, placement into ENG 111

This course provides a foundation for the use of acoustics in the marine environment while focusing on best practices for underwater search, survey, and visualization programs. Multiple sonar systems are presented, and they are representative of current industry equipment, operations, and practices. Emphasis is placed on field applications where sonar platform, water depth and temperature, target range, and size, acoustic frequency, and object reflectivity/absorption have an effect on target detection, resolution, and data accuracy.

Group 2 course.

WSI 211 Sonar for Search & Recovery .................. 1.5 (2)

Recommended competency(s): Prior use of sonar equipment in search and recovery applications.

This course provides training in the best use practices of multiple acoustic platforms for use in search and recovery operations typical to law enforcement, homeland security, and first responders from multiple agencies. Group 2 course.

WSI 212 Sonar for Marine Engineering .................. 2.0 (3)

Recommended competency(s): Prior use of sonar equipment in search and recovery applications.

This course provides both classroom theory and hands-on practicum/field operations performed individually and in groups. Emphasis areas include demonstrating techniques of sonar operations critical to sonar performance, spatial data collection, and data interpretation for use in marine engineering, survey, and underwater construction activities.

Group 2 course.

WSI 215 Marine GIS & Data Processing ............... 3.0 (4)

Required prerequisite(s): ENV 115 or GEO 115

This course builds upon the basics of GIS taught in ENV/GEO 115 - Introduction to GIS, with a focus on basic spatial analysis techniques using standard and maritime/marine datasets. More advanced cartographic methods and spatial data management techniques are introduced using ArcGIS Desktop, HyPack, and other computing tools. Group 2 course.

WSI 230 Water Policy & Sustainability .................. 3.0 (3)

Required prerequisite(s): ENG 111 and MTH 23, either may be taken concurrently

Recommended prerequisite(s): PLS 101, WSI 105

This course is designed to provide a basic understanding of the fundamental principles of water law and policy and human relationships, use, threats, and conflicts over water and aquatic resources. The course emphasizes a new integrative approach to water issues based on the nexus of the water commons to health, food, quality of life, energy, climate change, ecosystem, and economy. Group 2 course.

WSI 240 ROV Systems and Operations .............. 3.0 (4)

Required prerequisite(s): EET 103, MTH 111

Recommended prerequisite(s): ENG 111; Recommended competencies: Students should have basic computer skills and be comfortable working around water from either a boat or dock/pier.

This course introduces the technology of remotely operated vehicles (ROV) as a multicomponent system used for subsea activities including scientific study and research, subsea exploration and industrial applications. International Marine Contractors Association (IMCA) guidelines will be used for training. Students will gain firsthand experience operating the ROV for the purpose of collecting information from docks, piers, and research vessels. Group 2 course.

WSI 290 Freshwater Studies Internship .......... 1.0-3.0 (1-3)

Required prerequisite(s): ENG 111 and MTH 23, either may be taken concurrently

Recommended prerequisite(s): PLS 101, WSI 105

This course provides a foundation in the use of electronic sensors for remote observations. The focus will be on applications for marine and near-shore environments, though any sensor system/platform may be discussed. Basic sensor science will be applied to the study of remote sensing instruments, including marine acoustics, terrestrial acoustics, visible, laser/LIDAR, multispectral, and hyperspectral. Sensor development and evolution will be studied, as well as related current events and instruments used in deep-sea, commercial, military, and space science industries. Group 2 course.

WSI 300 Remote Sensing and Sensors .............. 3.0 (4)

Required prerequisite(s): PHY 121

Recommended prerequisite(s): WSI 200, placement into ENG 111

This course provides a foundation in the use of electronic sensors for remote observations. The focus will be on applications for marine and near-shore environments, though any sensor system/platform may be discussed. Basic sensor science will be applied to the study of remote sensing instruments, including marine acoustics, terrestrial acoustics, visible, laser/LIDAR, multispectral, and hyperspectral. Sensor development and evolution will be studied, as well as related current events and instruments used in deep-sea, commercial, military, and space science industries. Group 2 course.
WSI 310  Sonar Systems and Operations...............4.0 (6)
Required prerequisite(s): WSI 200, WSI 210
This course provides advanced training for the use of sonar systems in the subsea environment. Students will utilize multiple sonar systems for the purpose of profiling and imaging nearshore infrastructure; positioning and navigation of subsurface equipment; and interpreting collected sonar data for use in marine subsurface applications. Specific sonar systems utilized will include side scan sonar, scanning sonar and USBL systems. Group 2 course.

WSI 315  Advanced Marine Survey & Data...............3.0 (4)
Required prerequisite(s): PHY 121, WSI 215
Recommended prerequisite(s): WSI 300
This course provides a foundation in the coordination of maritime surveys from a pre-deployment standpoint. Students will be expected to have a strong understanding of the remote sensing science including capabilities and limitations of the sensor systems used. A major focus of the course will be to develop student skillsets for processing and merging marine and terrestrial datasets from a wide range of sources and systems. Significant time will be devoted to proper manipulation of data using commercial and freely-available tools. Group 2 course.

WSI 390  Marine Tech Internship .......................2.0 (2)
Required prerequisite(s): 60 credits of program specific courses with a GPA of 2.0 or higher
Recommended prerequisite(s): WSI 200
The purpose of the internship is to provide on-the-job training for the student who wishes to pursue a career in a technical field of study. The internship will be customized to meet the learning needs of the student and the job requirements of the sponsoring firm. Students spend 10-15 hours per week in this paid, supervised on-the-job training experience. In addition to the required 50 hours per credit in a work site, students participate in semi-monthly seminars. Students must apply one month prior to the semester in which they will complete the internship. Group 2 course.

WSI 400  Marine Technology Capstone.......................4.0 (4)
Required prerequisite(s): WSI 200, WSI 210, WSI 215, WSI 240, WSI 300, WSI 310, WSI 315; WSI 300 and WSI 315 may be taken concurrently
This course requires the synthesis and integration of knowledge and skills acquired across the Marine Technology curriculum for completion of a team oriented project and will require significant written, oral and visual deliverables including a final presentation. These field based projects will include a comprehensive approach to mission planning, technical equipment competency, budgeting, data collection/processing and dissemination to an audience. Group 2 course.

WSI 405  Marine Industry........................................3.0 (3)
Required prerequisite(s): Completion of 60 credit hours within major, must include WSI 200, WSI 210, WSI 240
This course focuses on contemporary issues and current events in the marine industry. It is intended to explore the global marine technology market while providing industry perspective from the marine sector including consequences of pollution, safety regulations, policy development, technology advances, and economics. Students will evaluate trends and conditions expected to influence the industry over the next five years. Group 2 course.

WSI 433  Marine Project Management.......................3.0 (4)
Required prerequisite(s): RAM 120, WSI 200, WSI 210, WSI 215, WSI 240
This course covers the practice of project management, design and development solutions specific to underwater marine equipment (ROV/AUV). Course emphasis will be on project development, teamwork, engineering principles and communication. The curriculum aligns with the PMI "body of knowledge" required to become a Certified Associate in Project Management (CAPM). Students will work in teams to design and construct a project based upon student interest. Group 2 course.

WSI 440  AUV Systems & Operations .....................3.0 (4)
Required prerequisite(s): WSI 200, WSI 210, WSI 215, WSI 240, and instructor permission
This course introduces the technology of autonomous underwater vehicles (AUV) for use in the marine environment. Students will learn mission planning, vehicle mobilization, launch and recovery techniques, remote guidance, and basic troubleshooting of an AUV system used for subsea activities including scientific study and research, subsea exploration and industrial applications. Students will gain firsthand experience operating the AUV in the Great Lakes. Group 2 course.
Student Rights and Responsibilities (Policy D-602.01)

The purpose of the Student Rights and Responsibilities statement is to define a student's basic rights within the college community, state what actions students may expect from the college to protect those rights, and explain the college's expectations of its student members, including the standards by which student behaviors are measured. This statement describes unacceptable student behavior and outlines the procedures by which students are disciplined if they engage in unacceptable conduct. [www.nmc.edu/about/policies/board-staff/D-602.01.html](http://www.nmc.edu/about/policies/board-staff/D-602.01.html)

Academic Policies

Northwestern Michigan College is committed to open access to higher education and to your academic success. Our intent is to offer support and remediation for students who are considered at risk of academic failure.

Attendance

Attendance is critical to student academic progress. Even though attendance expectations may differ from course to course, you are expected to be present, prepared, and be active participants in your classes. Students will receive a written attendance policy from the instructor at the first class meeting. A student who is repeatedly absent from class without good reason may be withdrawn from the course by the instructor.

Credit for Prior Learning

Students who have achieved competency in certain skill or course work areas may receive credit for classes or waivers of prerequisite classes. This competency could be gained through life, work, or military experience; vocational training at an area vocational, career or skill center; or completion of high school advanced placement courses. Assessment of proficiencies may be demonstrated through the following options:

- AP (Advanced Placement) credit achieved through high school courses;
- CLEP (College Level Examination Program);
- ACE (American Council on Education) for veterans;
- Competency Assessment in some NMC courses;
- Course waiver;
- Articulation credit for work at the Traverse Bay Area Career Tech Center

Students who wish to pursue credit or waivers for competencies should go to [www.nmc.edu/records](http://www.nmc.edu/records) or contact the NMC Registrar in the Records and Registration Office in the Tanis Building. Students wanting information or to register for the CLEP exam should call (231) 995-1360.

Credit Equivalences

An associate degree requires a minimum of 60 semester credits, or 96 quarter credits. A bachelor's degree usually requires a minimum of 120-128 semester credits, or 180-192 quarter credits. Thus, when credits are transferred from a college on the quarter system to a college on the semester system, a quarter credit is equivalent to two-thirds of a semester credit. For example, 30 quarter credits become 20 semester credits. No credits are “lost;” they are simply converted to a different unit. This may result, however, in some fractional credits. Obtain complete transfer information from a counselor.

Adding Classes

Courses are set up in sessions which vary by the number of weeks they meet (15-week, 8-week, 5-week, etc.). Students may add available courses up through the day before the session begins. Once the session begins, permission to add may be required from the Academic Chair or Office Manager (not the instructor). Not all academic areas will allow registration after the session has started.

Dropping Classes

Students must officially drop classes during the designated dates listed in the semester Registration Guide or online to obtain any refund or prevent receiving a grade at the end of the semester.

- Students dropping all of their classes may drop courses online at [www.nmc.edu/selfservice](http://www.nmc.edu/selfservice) if there are no holds on the student's record. You may also complete an enrollment form in the Records and Registration Office, or mail or fax a letter to the Records Office at (231) 995-1956. Include name, NMC ID, semester and signature. The date the letter is received is the official date of the withdrawal.
- Students dropping some of their classes may do so online at [www.nmc.edu/selfservice](http://www.nmc.edu/selfservice) if no holds are present or in the Records and Registration Office.

If you wish to drop either some or all classes online and have a hold, call (231) 995-1049 for options. In most cases, the hold may be temporarily moved to allow you to drop.

Courses may be dropped without record through the add period of the session that the course is offered. Courses dropped after the add period and before the last 25 percent of the session will be dropped with record. A grade of “W” (Withdrawn) will be assigned. This grade will not affect the NMC grade point average. Dropping a class is not permitted during the last 25 percent of the session in which the course is offered. It is the student's responsibility to notify their instructor(s) of the drop and be aware of any financial obligations.
Grades

STANDARD GRADING SYSTEM AT NMC:

4.0 - outstanding
3.5 - excellent
3.0 - good
2.5 - above average
2.0 - average
1.5 - below average
1.0 - deficient
0.0 - failed
S - satisfactory
U - unsatisfactory
I - incomplete
W - withdrawn
FA - failed to attend
AU - audit

S/U (satisfactory/unsatisfactory) may be given to designate the level of performance in courses which evaluate completion of specified competencies. (For designated courses only.)

I (incomplete) may be given at the discretion of the instructor if it is believed that the student has a valid reason for not having completed the course work and can fulfill the requirements of the course during the next semester. An incomplete not made up by the end of the next semester automatically becomes a 0.0. Incompletes may be extended one additional semester at the discretion of the instructor.

W (withdrawn) will be given to the student who officially withdraws from the class after the add period and before the last 25 percent of the session.

FA (failed to attend)—may be given if a student registered for a course but never attended and did not officially drop. FA will not affect a student’s GPA.

AU (audit) can be issued at the time of registration upon full payment of tuition and fees if a student wishes to attend a class without receiving college academic credit or a grade. Changing from “credit” to “audit” may take place through seventy-five percent of the academic session. Changing from “audit” to “credit” must be completed during the add period. Dates can be found online or in the current Registration Guide.

GOOD STANDING
You are considered to be in academic good standing when you have a minimum overall grade point average of 2.0.

GRADE POINT AVERAGE
Grade point average (GPA) is a weighted average of grades. A grade for a course is multiplied by the credit hours for that course to obtain “points.” Total points are then divided by total credit hours to determine the grade point average. A GPA calculator is available online.

When a course is repeated, both the most recent grade and the previous grade will appear on the transcript (official academic record). However, only the last grade will be counted in the NMC cumulative GPA. Grades of S, U, I, W, FA, and AU are not used in the computation of grade point averages. Consult with the Advising Center if this concerns you.

DEAN’S LIST
Students who have completed six or more credits and achieved a semester grade point average (GPA) of 3.5 or higher qualify for the Dean’s List. Each student receives a congratulatory letter from the Vice President for Educational Services. Dean’s List students will have their names listed in the lobby between the Biederman and Tanis buildings, and posted online.

GRADE POINT RE-EVALUATION
Northwestern Michigan College offers you an opportunity to improve upon a cumulative grade point average by repeating a course or courses, or by petitioning for a grade point re-evaluation under special circumstances. These options provide you with the opportunity to achieve a cumulative grade point average that is truly representative of your capabilities. You may pursue this option by calling the Advising Center for petitions and further information: (231) 995-1040. Transfer institutions may or may not recognize GPA re-evaluation.

For more information on GPA re-evaluation, visit www.nmc.edu/records and click on “grades.”

Academic Probation
Any student whose cumulative grade point average is below a 2.0 is considered academically at risk and will be placed on academic probation. The purpose of academic probation is to assure careful academic planning and referral to support services while the student attempts to improve his or her academic record.

SUPPORT & INTERVENTION FOR STUDENTS ON ACADEMIC PROBATION
Any student who is on probation must meet with an academic advisor prior to registering for any semester or session until the status of probation is removed. This enables the student to build a realistic academic program and receive appropriate referrals to support services that afford the maximum possibility for success. Students who are on probation may not take more than 12 semester credits during fall/spring semester, or six credits during the summer session. The status of academic probation is removed when the student’s cumulative grade point average becomes 2.0 or higher.

Academic Suspension
When a student has been on probation for two semesters and is unable to maintain a current grade point average of 2.0 or higher, that student will be suspended from academic enrollment for a period of one semester of the regular academic year (not including summer.) A student may appeal academic suspension to the Registrar in writing.
REINSTALLMENT FOLLOWING ACADEMIC SUSPENSION
A student who has been academically suspended is encouraged to petition the Registrar for reinstatement when the waiting period is over if he/she feels that sufficient changes have occurred to enable academic success. This petition must be made in writing at least two weeks prior to the beginning of the semester for which the student is seeking re-entry.

Grade Alert
Learning is dependent upon regular feedback regarding student performance. Students and instructors are both responsible for this communication. Students achieving less than a 2.0 in any 15-week class may receive notification to their NMC email around the midpoint of the academic session encouraging them to contact their instructor.

Repeating Courses
Northwestern Michigan College offers you an opportunity to improve upon a cumulative GPA by repeating a course or courses. All courses and grades will appear on the transcript (official academic record); however, only the last grade will be counted in the cumulative grade point average. Most courses at NMC can be taken a maximum of three times. Exceptions are activity courses such as physical education and applied music. Although NMC allows a student to repeat a class up to two times, Financial Aid may have further restrictions and should be consulted.

Transcripts
Students who plan to attend another college or university will need to send an official transcript of their academic record to that college. Often new employers require an official copy of your transcript. A transcript is a list of the academic courses taken at NMC and the grades earned. Your official transcript will be sent to colleges or employers upon your written request. If you request the transcript be sent to you, it may not be considered official. Each request should include:

1. Your name, permanent address, and NMC ID or social security number
2. Name and address where the transcript is to be mailed
3. Your signature
4. Your phone number
5. $5 for each transcript

Requests may be made online at www.nmc.edu/selfservice, in person, by mail or by fax (231) 995-1956. Fax requests will be honored if you include your charge card number (Visa, MasterCard or Discover) and expiration date to cover the transcript fee.

Transcripts may be faxed to a third party but may not be considered official. Contact the third party for confirmation. To protect the confidentiality of the student, telephone requests cannot be honored. Students may obtain an unofficial copy of their transcript at no charge through the self-service menu at www.nmc.edu/registration. All transcripts printed on transcript paper through the Records Office have a fee of $5. Transcript requests can be completed only if all fees and obligations to NMC have been fulfilled.

Inclement Weather Policy
It is the policy of Northwestern Michigan College to maintain normal college operations on all regularly scheduled days, except in very rare cases when severe weather conditions prevent this.

It is further the policy of NMC that each staff member and student will make his or her own determination concerning attendance on unfavorable travel days.

Given unfavorable weather conditions, the college may choose to delay or close, in which case the following actions will be taken:

- For daytime classes, a decision to delay the opening of the college or close entirely will be communicated by 6 a.m.
- For evening schedules, delays or closings will be announced by 3 p.m. There is a possibility that NMC would cancel all day classes and hold evening classes.
- If the college delays opening, students should report to class at the designated opening time. If a student’s class begins before the designated opening time, that class would be canceled unless one-hour of instruction remains after the designated opening time. Up-to-date information regarding class cancellations and college closures will be communicated on the 24-hour telephone line at (231) 995-1100.
- College delays or closures will be reported to area radio and television stations (a list of stations is available in the Office of Institutional Advancement) campus video monitors, public access channel, NMC’s general information number (231) 995-1000, and online.
- College delays or closures will be reported via email to all faculty and staff, via email to all student email accounts, and via text message to those students who are subscribed to receive alerts on their cell phones.
- For weekend academic courses, the college closure/delay decision will first be enforced. If, on the other hand, a faculty member determines he/she cannot make it to campus for their particular class, the faculty member teaching the weekend course will update his/her voicemail greeting with the class cancellation information. Weekend students should then call their instructor’s voicemail rather than the 24-hour telephone line.

Non-Discrimination Policy
NOTICE:
Northwestern Michigan College is committed to a policy of equal opportunity for all persons and does not unlawfully discriminate on the basis of race, color, national origin, religion, disability, genetic information, height, weight, marital status or veteran status in employment, educational programs and activities and admissions. www.nmc.edu/nondiscrimination
Harassment Policy

Northwestern Michigan College (NMC) prohibits sexual misconduct, which includes but is not limited to: rape, acquaintance rape, sexual assault, sexual harassment, stalking, dating violence, and domestic violence. Sexually violent acts, termed sexual misconduct by NMC are violations of NMC’s Student Rights & Responsibilities, and can be crimes as well.

The College shall promptly and thoroughly investigate complaints of discrimination and/or harassment. Complaints of discrimination and /or harassment will be treated as confidentially as possible. The College will conduct fair, thorough, impartial, and timely investigation of the allegation(s) presented in a complaint. Procedures detailing the investigation and resolution processes of NMC can be found online: www.nmc.edu/policies (D-702.01 - Discrimination and Harassment Complaint Procedure).

For additional information, contact the Vice President for Enrollment Management and Student Services at (231) 995-1046. Employees may contact the Director of Human Resources at (231) 995-1342.

Right to Know

In 1990, Congress passed into law the Student Right-to-Know and Campus Security Act. The legislation is designed to provide better consumer information to students and their families by requiring institutions of higher education to compile and report completion or graduation rates, job placement statistics, crime statistics, as well as general information about the college. Job placement statistics, crime statistics, and general information about the college is available in the Registration Guide and the student newspaper, or may be obtained in the Admissions Office, Tanis Building, (231) 995-1054. For completion or graduation rates contact the NMC Registrar at (231) 995-1058. All Board of Trustee and Student Government meetings are open to students.

Campus Security & Safety Policy

The safety of students, faculty, staff and visitors is of vital concern to Northwestern Michigan College. Everyone in the campus community is involved in creating a safe environment and is encouraged to report all safety concerns by calling campus security, (231) 883-9099. Emergency outdoor phones are identified by a blue light; all incidents will be documented and investigated. NMC has a staff of campus security personnel who work closely with the Traverse City Police Department. On a regular basis, information and presentations are made available to students and employees on issues of importance to campus safety. The campus safety report is published in the Registration Guide each semester and is in compliance with the Student Right-to-Know and Campus Security Act. Visit www.nmc.edu/safety to view a daily crime log. Click on crime log.

Campus Safety Report

Mission: to establish a system of communication and response to provide for the safety of students and employees.

A. Report Procedures: To report criminal actions, emergencies, or suspicious situations, call: Emergencies.................................911
Campus Security..............................(231) 883-9099

Emergency outdoor phones are identified by a blue light and can be used to make on-campus calls. To make an emergency call, press the red button, state your location and the situation. Police personnel will respond.

B. Access to Campus Facilities: All campus buildings are open from 7 a.m. to 10 p.m., Monday through Friday, and at other times on weekends depending on need. Residence halls are open from 7 a.m. to 12 midnight every day. Residents have keys and guests are required to register with the residence hall staff after midnight. All guests must be escorted by the resident they are visiting.

C. Authority of Institutional Security Personnel: The NMC Campus Security personnel have the authority to confront the individuals related to an incident, require identification, and when necessary, contact the Traverse City Police Department. Officers keep a daily record of activities and all incidents are promptly reported to the Campus Liaison Officer.

D. Information Programs: On a regular basis students and employees receive information on campus security and crime prevention and are invited to attend presentations on such subjects as sexual assault and rape; fire prevention; crime prevention; bomb threats; and alcohol and drug abuse prevention.

E. Occurrence Statistics: The NMC Campus Security and Safety Department has compiled these statistics for incidents on NMC’s four campuses from January 1, 2013 to December 31, 2013. Go to www.nmc.edu/security to view statistics for the past three years.

Offenses On Campus

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The Michigan State Police make available the list of registered sex offenders at [www.michigan.gov/msp](http://www.michigan.gov/msp) select “Michigan Sex Offender Registry.”


### Drug-Free Learning Environment Policy

It is the intent of Northwestern Michigan College to provide a drug-free workplace and learning environment for students, faculty and staff. Furthermore, NMC intends to comply with the provisions of the Drug-Free Schools and Communities Act of 1989. All students, employees, and visitors are expected to observe all federal, state and local laws and college regulations governing the use and possession of alcohol and illicit drugs. All students, employees and visitors are specifically forbidden to use or possess alcoholic beverages, or to be under the influence of any controlled substance while on college property (except as provided by policy for use of alcohol on campus) or violate conditions of Controlled Substance Act.

### Tobacco-Free Policy

In the interest of providing a safe, clean and healthy environment for students, employees and visitors, NMC has prohibited smoking on all campuses.

### Student Sexual Assault Policy

**I. Legal and Behavioral Definition of Sexual Assault**
Northwestern Michigan College (NMC) prohibits sexual misconduct, which includes but is not limited to: rape, acquaintance rape, sexual assault, sexual harassment, stalking, dating violence, and domestic violence. Sexually violent acts, termed sexual misconduct by NMC are violations of NMC’s Student Rights & Responsibilities, and can be crimes as well. All reported incidents will be investigated and, if necessary, disciplinary sanctions will be imposed. Procedures detailing the investigation and resolution processes of NMC can be found online: [www.nmc.edu/policies](http://www.nmc.edu/policies) (D-602.05 - Student Sexual Assault).

**II. Reporting Sexual Assault**
The following campus offices may be contacted to report a sexual assault:
- Vice President of Enrollment Management and Student Services... (231) 995-1046
- Office of Residence Life..........(231) 995-1400
- Office of Student Life ............. (231) 995-1118
- Student Health Services.........(231) 995-1256
- Local law enforcement .................. 911
- Campus Safety and Security ...........(231) 995-1111

The option of reporting to a supervisor in any discipline or department is also available.

### Family Educational Rights & Privacy Act

The Family Educational Rights and Privacy Act (FERPA) helps protect the privacy of student records. The Act provides for the right to inspect and review educational records, the right to seek to amend those records and to limit disclosure of information from the records. Institutions may disclose information on a student without violating FERPA through what is known as “directory information.” Directory information includes the student’s name, address, telephone number, e-mail address, date and place of birth, major field of study, participation in officially recognized activities, enrollment status, dates of attendance, degrees and awards received. Questions about student records may be directed to the Registrar. Go to [www.nmc.edu/records](http://www.nmc.edu/records) for more information.

### Privacy Statement

In order to improve the instruction offered at Northwestern Michigan College and to meet the requirements of the Carl D. Perkins Vocational and Technical Education Act, Section 113 and the Workforce Investment Act of 1998, Section 122, we will be using your Social Security Number in order to compile summary reports. Section 113 of the Carl D. Perkins and Technical Education Act, 20 USC 2323, and section 122 of the Workforce Investment Act of 1998, 29 USC 2842, requires Northwestern Michigan College and the State of Michigan to assess the effectiveness of vocational and technical education programs aimed at training, placement, and retention of students in employment. Although these laws require that performance reports be compiled based on wage record information, neither law requires students to give their social security numbers (SSN) to the college.

Northwestern Michigan College reports currently enrolled student status to the National Student Clearinghouse each semester. This information is provided to assist students to defer repayment of student loans during the time a student is enrolled. Information is also provided to verify degrees earned and may be used by potential employers who contact the National Student Clearinghouse. Students may access the Clearinghouse website through NMC’s secure website to obtain verification of their student status to be used for insurance purposes.
Find it here.
Additions to the 2015-2016 NMC Catalog

The information contained in this catalog addendum is provided as an update and in addition to the Academic Catalog effective April 2015.

Program Updates:

New Programs and Certificate!

- Program Name: Construction Technology - General – Associate in Applied Science Degree
  - NMC Code: 368
- Program Name: Surgical Technology – Associate in Applied Science Degree
  - NMC Code: 311
- Certificate Name: Construction Technology – Carpentry Technology – Certificate of Achievement Level II
  - NMC Code: 068

Correction to Plant Science - Associate in Applied Science Degree, Agricultural Operations: The NMC code should be 585

Agricultural Operations………………………………..NMC Code 585

Change to Dental Assistant – Associate in Applied Science – NMC Code 300 and Dental Assistant Certificate of Achievement (Level II) – NMC Code 070:

HDA 251 (4 credits/4 contacts) and HDA 252 (4 credits/4 contacts) will be replaced with HDA 290 (5 credits/5 contacts)

Change to Aviation – Associate in Applied Science - NMC code 562

Under Occupational Specialty Requirements, student may take:

AVF 111 - Private Flight OR AVF 115 - Helicopter Private Pilot
New Courses:

**AVF 131  Instrument Flight Helicopter.........................4.0 (7)**
*Required prerequisite(s): AVF 115*

A flight course structured to provide the necessary dual flight hours to meet the aeronautical experience requirements for the FAA Instrument Helicopter rating. This course will be completed upon the student obtaining their Instrument Helicopter rating. Course requires 50 flight hours and 24 hours of ground instruction. Hourly rates for 2015 – 16 are $65/hour for ground instruction and $561/hour for the aircraft and flight instructor. **Group 2 course.**

**AVG 201  International Aviation...................................3.0 (3)**
*Recommended prerequisite(s): Placement into ENG 111*

This course will provide an overview and analysis of the international aviation industry. International oversight organizations will be reviewed along with interactions with national regulations. Students will evaluate country differences with regard to aviation regulations, global safety records and business forecasts. An overview of cultural differences, which can effect International Aviation Operations, will be covered with case studies from current international pilots. **Group 2 course.**

**HDA 290  Dental Assistant Internship............................5.0 (5)**
*Required prerequisite(s): HDA 240, HDA 241*
*Corequisite(s): HDA 286*

Students are assigned to dental offices in the community. 300 hours of hands-on experience includes chairside assisting in general offices, office management, laboratory techniques and expanded functions. A minimum of 200 hours must be completed in a general practice and the additional 100 hours can be in a specialty practice. Each student must also observe for four hours in each of the following: endodontics, oral surgery, orthodontics and periodontics. This course includes 6 hours of internship meetings with the instructor and classmates. During the internship experience, students must show progression from "O" (observed) to "W" (with assistance) to "A" assisted alone) on their journal entries. **Group 2 course.**

**MFG 290  Manufacturing Tech Internship.......................2.0-4.0 (2-4)**
*Required prerequisite(s): 30 credits of program specific courses with a GPA of 2.0 or higher*

The purpose of the internship is to provide on-the-job training for the student who wishes to pursue a career in a technical field of study. The internship will be customized to meet the learning needs of the student and the job requirements of the sponsoring firm. Students spend 10-15 hours per week in this paid, supervised on-the-job training experience. In addition to the required 50 hours per credit in a work site, students participate in semi-monthly seminars. Students must apply one month prior to the semester in which they will complete the internship. **Group 2 course.**

**MGT 290  Management Internship...............................3.0 (3)**
*Required prerequisite(s): 30 credits of program specific courses with a 2.0 or higher*

The purpose of the internship is to provide on-the-job training for the student who wishes to pursue a career in Management. The internship will be customized to meet the learning needs of the student and the job requirements of the sponsoring firm. Students spend 10-15 hours per week in this paid or unpaid, supervised on-the-job training
experience. In addition to the required 50 hours per credit in a work site, students participate in three seminars. Students must apply one month prior to the semester in which they will complete the internship. Group 2 course.

**MKT 290 Marketing Internship**..........................3.0 (3)
*Required prerequisite(s): 30 credits of program specific courses with a 2.0 or higher*

The purpose of the internship is to provide on-the-job training for the student who wishes to pursue a career in Marketing. The internship will be customized to meet the learning needs of the student and the job requirements of the sponsoring firm. Students spend 10-15 hours per week in this paid or unpaid, supervised on-the-job training experience. In addition to the required 50 hours per credit in a work site, students participate in three seminars. Students must apply one month prior to the semester in which they will complete the internship. Group 2 course.

**SRG 101 Intro to Surgical Technology**..................3.0 (3)
*Required prerequisite(s): BIO 227, HAH 101, HPD 110; SRG 102 and SRG 103 can be taken concurrently*
*Recommended prerequisite(s): BIO 228*
*Corequisite(s): SRG 101L*

In this course students will learn the primary functions of the surgical technologist in multiple roles within the operating room environment. Points of focus will include effective communication, professional interactions with the patient and surgical team, proper personal protective equipment, introduction to asepsis, safety precautions, All-Hazard preparation, instrumentation, equipment, supplies, stapling devices, suture, and infection control and wound healing. Group 2 course.

**SRG 101L Intro to Surg Tech Lab**..........................3.0 (3)
*Corequisite(s): SRG 101*

In this course students will learn and practice in the laboratory environment the skills required to perform in the surgical setting. Emphasis will be placed on introductory skills, instrumentation, equipment and procedures relevant to general, gynecological, and genitourinary procedures. Students will be evaluated on their sterile and aseptic technique as well as case management skills. Group 2 course.

**SRG 102 Surgical Microbiology**..........................1.5 (1.5)
*Required prerequisite(s): SRG 101; SRG 103-can be taken concurrently*

Students in this course will learn about the cell, cell organelles and processes, and transport. This course will also cover varying types of organisms that cause infection, the infection process, and microbe identification. The body's natural defense system as well as common bacteria, viruses, and fungi that cause disease will be covered including the response. Group 2 course.

**SRG 103 Surgical Pharmacology**..........................1.5 (1.5)
*Required prerequisite(s): SRG 101; SRG 102-can be taken concurrently*

In this course students will learn the pharmaceuticals used in surgical practice to include their actions, use, effects, contraindications and administration. The anesthesia process will be covered in defining the stages of general anesthesia as well as the different types of agents used. The course will cover the equipment, safe practices, sterile technique and terminology used in relation to pharmacology. Students will also cover practices relating to alternative therapies such as herbal medication, acupuncture, massage, and music therapy and their effect on the surgical patient. Group 2 course.
SRG 121  Surgical Procedures I .............................. 4.0 (4)
*Required prerequisite(s): SRG 101, SRG 101L, SRG 102, SRG 103; SRG 122 and SRG 123-can be taken concurrently*

Corequisite(s): SRG 121L

Students in this course will study the relevant surgical anatomy and physiology, pathophysiology, supplies, equipment, and instrumentation needed for a variety of procedures in the areas of general, obstetrics and gynecological, genitourinary, and orthopedic surgery. **Group 2 course.**

SRG 121L  Surgical Procedures I Lab.......................... 3.5 (7)
*Required prerequisite(s): SRG 101, SRG 101L, SRG 102, SRG 103; SRG 122 and SRG 123-can be taken concurrently*

Corequisite(s): SRG 121

Students in this course will learn and practice in the laboratory environment the skills required to perform in the surgical setting. Emphasis will be placed on advanced skills concerning instrumentation, equipment and procedures relevant to orthopedic, ENT, plastic, reconstructive, minimally invasive, and vascular procedures. Students will also practice patient transport, transfer, urinary catheterization, skin prep, patient positioning and draping procedures. Students will be evaluated on their sterile technique and case management skills. This course will also include a clinical observation component of the relevant areas of the perioperative environment. **Group 2 course.**

SRG 122  The Surgical Patient................................. 0.5 (0.5)
*Required prerequisite(s): SRG 121, SRG 121L, SRG 123-all can be taken concurrently*

In this course students will define patient-centered care utilizing Maslow's hierarchy to determine the differing needs of the various patient populations that visit the surgical department. Important areas that will be described include appropriate communication, cultural and spiritual competence, and grief advocacy. This course will cover the aspects of the death in the operating room along with the organ transplant process. Students will also cover patient transport, transfer, urinary catheterization, skin prep, patient positioning and draping procedures. **Group 2 course.**

SRG 123  Biomed Sciences and MIS......................... 1.5 (1.5)
*Required prerequisite(s): SRG 121, SRG 121L, SRG 122-all can be taken concurrently*

Students in this course are introduced to the basic concepts of physics to include the elements of motion, energy, light, sound and electricity and how they apply to surgical practice. Further study will include aspects of minimally invasive surgery including laparoscopy and robotic surgery. Students will also be introduced to the cases performed in interventional radiology and how they are integrated within surgical practice. The course will conclude with the study of diagnostic interventions integral in surgical practice as well as diagnosing pathologies preoperatively. **Group 2 course.**

SRG 201  Surgical Procedures II.............................. 3.0 (3)
*Required prerequisite(s): SRG 123; SRG 202 and SRG 204-both can be taken concurrently*

Students will study the relevant surgical anatomy and physiology, pathophysiology, supplies, equipment, and instrumentation needed for a variety of procedures. Surgical procedures covered will include the areas of otorhinolaryngology, neurology, and ophthalmic surgery. **Group 2 course.**
SRG 202  Surg Procedures II Clinical………………………..5.0 (15)
*Required prerequisite(s): SRG 201, SRG 204-both can be taken concurrently*

In this course students will be in the clinical environment practicing to and performing essential skills required in the perioperative environment. While under the supervision of a surgical technologist or RN the student will observe, scrub, and assist on procedures as directed by the surgical team. **Group 2 course.**

SRG 204  Professional Career Prep I……………………….0.5 (0.5)
*Required prerequisite(s): SRG 201, SRG 202-both can be taken concurrently*

In this course students will work with the Office of Career Services to complete a career portfolio and employment training. Major topics in this course include resume creation both written and online portfolios, interview preparation, job search strategies, and professional attire. **Group 2 course.**

SRG 221  Surgical Procedures III.................................3.0 (3)
*Required prerequisite(s): SRG 201, SRG 202, SRG 204; SRG 222 and SRG 224-both can be taken concurrently*

Students in this course will study the relevant surgical anatomy and physiology, factors unique to surgical procedures, pathophysiology, supplies, equipment, and instrumentation needed for a variety of procedures. Surgical procedures covered include the disciplines of neurology, vascular and cardiothoracic surgical procedure categories. **Group 2 course.**

SRG 222  Surg Procedures III Clinical…………………..6.0 (18)
*Required prerequisite(s): SRG 221, SRG 224-both can be taken concurrently*

In this course students will continue working in the surgical environment under the direction of a surgical technologist or RN. The student will observe, scrub, and assist on more complex surgical cases as directed by the surgical team. The progression from student to entry level surgical technologist is the goal for the completion of this course along with the successful completion of the 120 scrubbed case requirements. **Group 2 course.**

SRG 224  Professional Career Prep II.........................1.0 (1)
*Prerequisite(s): SRG 221, SRG 222-both can be taken concurrently*

In this course the students will focus on exam preparation for the certification exam given by the National Board of Surgical Technology and Surgical Assisting (NBSTSA) that will be taken electronically on campus the last week of the program. Testing strategies and studying techniques will be a large focus point as well as written and online practice exams. **Group 2 course.**

**Course Changes – Credits, Contacts or Required Prerequisites (effective Fall 2015)**

MFG 114  Machining II..................................................3.0 (5)
Contacts were reduced from 6 contacts to 5 contacts.
Course Description Changes (effective Fall 2015)

AUD 131  Live Sound II..........................2.0 (2)

*Required prerequisite(s): AUD 130*

This course concentrates on developing a working understanding of the tools used to influence and manipulate sound. Area of study include how audio signals are created and utilized, microphones and microphone techniques, what a mixer does and how to use it, the manipulation of signal, and how amplification works. Also covered in this course are OSHA basics, types of loudspeakers and what they do, what a monitor does and how to set it up, production communication, the role of performance staging, trussing and rigging, and how they all work together. **Group 2 course.**

AUD 230  Live Sound III.................................2.0 (2)

*Required prerequisite(s): AUD 131*

This course will focus on real world application of the tools. The student will be presented with the opportunity to learn advanced mixing concepts for FOH and Monitor systems, the theory of sound system design, performance/show logistics, performance contract basics, local ordinance issues, risk and liability and why "The Show Must Go On". **Group 2 course.**

AVF 111  Private Pilot Flight.................................5.0 (5)

*Required prerequisite(s): Instructor permission*

A flight course structured to provide dual and solo flight hours to meet the aeronautical experience requirements for a private pilot. Upon completion of this course, the student will have attained the FAA Private Pilot Rating. Course requires 40 hours of flight time and 16.5 hours of ground instruction. Hourly rates for 2015 – 16 are $52/hour for ground instruction and $220/hour for the aircraft and flight instructor. **Group 2 course.**

AVF 115  Helicopter Private Flight..........................4.0 (4)

*Required prerequisite(s): Instructor permission*

A flight course structured to provide the necessary dual and solo flight hours to meet the aeronautical experience requirements for the FAA Helicopter Private Pilot rating. This course will be completed upon the student obtaining their Private Pilot Helicopter rating. Course requires 40 hours of flight time and 24 hours of ground instruction. Hourly rates for 2015 – 16 are $65/hour for ground instruction and $561/hour for the aircraft and flight instructor. **Group 2 course.**

AVF 118  Instrument Flight I.............................1.0 (1)

*Required prerequisite(s): Private Pilot Rating*

This course is the beginning stage of the Instrument Pilot Rating. The ground work will be laid for students to safely fly by the instruments. Skills and techniques will be gained to effectively move to Instrument Flight II where holding, tracking, and approaches will be learned. Both the aircraft and flight simulator will be used to obtain skills required for this course. Objectives learned will go toward the FAA Instrument Rating. Course requires 17.9 flight hours and 8.7 hours of ground instruction. Hourly rates for 2015 – 16 are $52/hour for ground instruction and $220/hour for the aircraft and flight instructor. **Group 2 course.**
AVF 130 Instrument Flight II..................................................2.0 (2)

Required prerequisite(s): AVF 118, Private Pilot Rating

The aircraft and the simulator will be used to teach the required skills. The student will learn tracking and instrument approaches. At the culmination of this course the student will have gained actual instrument flight time and be a competent instrument pilot and will be signed off for the FAA Instrument check ride. Course requires 25.5 flight hours and 8.5 hours of ground instruction. Hourly rates for 2015 – 16 are $52/hour for ground instruction and $220/hour for the aircraft and flight instructor. Group 2 course.

AVF 131 Instrument Flight Helicopter........................................4.0 (7)

Required prerequisite(s): AVF 115

A flight course structured to provide the necessary dual flight hours to meet the aeronautical experience requirements for the FAA Instrument Helicopter rating. This course will be completed upon the student obtaining the Instrument Helicopter rating. Course requires 50 flight hours and 24 hours of ground instruction. Hourly rates for 2015 – 16 are $65/hour for ground instruction and $561/hour for the aircraft and flight instructor. Group 2 course.

AVF 230 Commercial Flight I..................................................2.0 (2)

Required prerequisite(s): AVF 130, may be taken concurrently

The student will advance their skills required by the FAA to obtain a Commercial Pilot Certificate. They will gain experience in different aircraft with the opportunity to gain a Tailwheel Endorsement or Seaplane Rating. Students will increase their instrument proficiency while conducting cross country flights. Course requires 44.4 flight hours and 1.3 hours of ground instruction. Hourly rates for 2015 – 16 are $52/hour for ground instruction and $220/hour for the aircraft and flight instructor. Group 2 course.

AVF 232 Commercial Flight II.................................................3.0 (3)

Required prerequisite(s): AVF 230, may be taken concurrently

A flight course structured to provide a dual and solo flight hours to partially fulfill the flight hour requirements for the FAA Commercial Pilot Certificate. This course will provide a review of VFR and IFR cross country navigation procedures and introduce the student to multi-engine flight. Course requires 33.4 flight hours and 10.3 hours of ground instruction. Hourly rates for 2015 – 16 are $52/hour for single engine ground instruction and $62/hour for multi-engine flight instruction and $220/hour for the single aircraft and flight instructor and $331/hour for the multi-engine aircraft and instructor. Group 2 course.

AVF 234 Commercial Flight III.................................................2.0 (2)

Required prerequisite(s): AVF 232, may be taken concurrently

This course is the last of three flight courses required to obtain the FAA Commercial Pilot Certificate. This course consists of flight hours with an emphasis on commercial flight maneuvers in preparation for the Commercial Pilot FAA Practical Test. Upon completion of this course, the student will have attained the FAA Commercial Pilot Certificate. Course requires 17.2 flight hours and 8.5 hours of ground instruction. Hourly rates for 2015 – 16 are $52/hour for ground instruction and $202/hour for the aircraft and flight instructor. Multi-engine training lessons will be charged at $62/hour for ground instruction and $331/hour for the aircraft and flight instructor. Group 2 course.
AVF 237  Helicopter Commercial Pilot.................................4.0 (4)

Required prerequisite(s): AVF 115

A flight course structured to provide the necessary dual and solo flight hours to meet the aeronautical experience requirements for the FAA Helicopter Commercial Pilot rating as an add on rating to the FAA Commercial Airplane Single Engine rating. This course will be completed upon the student obtaining their Commercial Pilot Helicopter rating. Course requires 50 flight hours and 30 hours of ground instruction. Hourly rates for 2015 – 16 are $65/hour for ground instruction and $561/hour for the aircraft and flight instructor. Group 2 course.

AVF 271  Multi-Engine Flight...............................................1.0 (1)

Required prerequisite(s): Private Pilot Rating

This flight course is designed to give the student the aeronautical knowledge, proficiency, and experience required to meet the FAA Practical Test Standards for the Private or Commercial Multi-engine rating. Upon completion of this course, the student will have attained the FAA Multi-engine Land Rating. Course requires 4 flight hours and 1 ground hour. Hourly rates for 2015 – 16 are $65/hour for ground instruction and $331/hour for the aircraft and flight instructor. Group 2 course.

AVF 274  Tailwheel Flight.......................................................1.0 (1)

Required prerequisite(s): Private Pilot Rating

This course is designed to provide the student with the skills, knowledge, and experience to receive a logbook endorsement to fly tailwheel aircraft. Course requires 4 flight hours. Hourly rate for 2015 – 16 is $200/hour for the aircraft and flight instructor. Group 2 course.

AVF 275  Seaplane Flight.........................................................2.0 (2)

Required prerequisite(s): Private Pilot Rating

In this course, the student will gain the skills, knowledge, and experience to receive endorsement for the FAA Practical Test. Students will learn in a Piper Super Cub on floats as they demonstrate maneuvers and landings. Course requires 5 flight hours and 1 hour of ground instruction. Hourly rates for 2015 – 16 are $52/hour for ground instruction and $202/hour for the aircraft and flight instructor. Group 2 course.

AVF 283  Upset Maneuver Training........................................1.0 (1)

Required prerequisite(s): Private Pilot Rating

In this course, the student will learn the foundations to safely perform basic aerobatic maneuvers. Also, the student will gain confidence and skills necessary to recover from various unusual flight attitudes that will increase the students' overall flight safety. Course requires 6 flight hours and 2 hours of ground instruction. Hourly rates for 2015 – 16 are $52/hour for ground instruction and $200/hour for the aircraft and flight instructor. Group 2 course.
AVF 284 Instrument Flight Instructor………………………………2.0 (2)

Required prerequisite(s): Flight Instructor Rating

The student perfects both teaching and instrument flying skills while sitting in the right seat of the cockpit. The student develops the knowledge and ability to teach others instrument flying procedures. Course requires 6 flight hours and 8 hours of ground instruction. Hourly rates for 2015 – 16 are $52/hour for ground instruction and $220/hour for the aircraft and flight instructor. **Group 2 course.**

AVF 382 Flight Instructor Rating……………………………………4.0 (4)

Required prerequisite(s): Commercial Pilot with Instrument Rating

In this course the student will learn the skills to be a Certified Flight Instructor (CFI). They will master the skills of the Private and Commercial Pilot ratings. In addition they will learn how to be an effective teacher and understand all FAA rules and regulations that accompany being an instructor. Course requires 18 flight hours and 20 hours of ground instruction. Hourly rates for 2015 – 16 are $52/hour for ground instruction and $202/hour for the aircraft and flight instructor. **Group 2 course.**

VCA 290 Visual Comm Internship………………………………3.0 (3)

Required prerequisite(s): Students must have completed all VCA courses with a minimum 2.5 GPA and departmental approval.

Recommended prerequisite(s): The student should possess good written, graphic and oral communication skills, and have a portfolio of work/resume to show employers.

This course is the capstone for the AAS degree in Creative Management Art Direction. This internship provides on-the-job experience for the student who wishes to pursue a career in visual communications. Customized to meet the learning needs of the student and the job requirements of the sponsoring firms, students spend 180 hours in paid or non-paid, supervised on-the-job training experiences. In addition students participate in bi-weekly reports and weekly online methodology discussion boards with the instructor/peers. Students must apply one month prior to the semester they wish to complete class. **Group 2 course.**