2016-2017

LAKE MICHIGAN COLLEGE®

COLLEGE CATALOG

Verson 1 - 7/5/16

This page intentionally blank

2016-2017 COLLEGE CATALOG

Table of Contents

Information contained in this College Catalog is, to the best knowledge of the Lake Michigan College staff, considered correct at the time of publishing. However, this Catalog should not be considered a contract between Lake Michigan College and any student. Lake Michigan College reserves the right to make changes to the information contained herein without notice or obligation. Please visit the Lake Michigan College website for the most current information.

Program, Transfer, and Degree Information

At Lake Michigan College, it's easy to start here and transfer to any university, or enter a Career Education program and earn an associate degree, a bachelor degree, or a certificate.

Refer to specific program pages in this catalog for detailed program information and faculty contact information. Please work with an advisor to plan your course of study.

Certificate Programs
Certificate programs are a great way to prepare you for entry-level employment or enhance your skills for greater employment opportunity. Certificates are available in a broad range of disciplines and are designed to get your career off to a quick start. Students who earn certificates often return to LMC to earn their associate degrees to advance their careers or transfer to a university. See the appropriate catalog page for additional details or make an appointment with the faculty contact or an academic advisor for more information.

Associate Degree Programs
Associate degree programs that focus on career education prepare students for many well-paying, in-demand careers. Students may earn associate degrees and enter the workforce or transfer to a university, depending on their career goals. Students can select from many areas of study that will lead to one of the following degrees: Associate in Applied Science, Associate in Science, Associate in Arts, Associate in General Studies, or Associate in Business Administration.

Bachelor Degree Program
Lake Michigan College offers a Bachelor of Applied Science, Energy Production and Distribution Management program for students who wish to pursue a career as a highly-skilled professional in the energy production industry.

Transfer Programs
Lake Michigan College offers a variety of transfer programs and is a participating institution of the Michigan Transfer Agreement. The Michigan Transfer Agreement (MTA) was designed to facilitate the transfer of general education requirements from one institution to another. For more information on the Michigan Transfer Agreement and links to numerous university transfer guides, visit **lakemichigancollege.edu/transfer.**

Your transfer institution may require you to complete additional course work specific to your major. Please work with the Career and Transfer Center and your academic advisor to help you build your academic plan so that you're well-prepared for a successful transfer to the college or university of your choice.

The following page of this catalog lists all of Lake Michigan College's degrees, programs, and certificates.

Degrees, Certificates and Major Fields of Study

Bachelor of Applied Science *with a MAJOR in:*
EPDM Energy Prod & Distribution Mgmt**

Associate in Applied Science *with a MAJOR in:*
AASG Applied Science – General
ACCT Accounting
APDV Applications Development
BUSI Business
314 Casino Management – Four Winds**
CHDV Child Development
COSC Computer Science
CRJU Criminal Justice
312 Culinary Management
230 Dental Assisting
225 Diagnostic Medical Sonography**
EEDW Elementary Education (K-8 Certification) WMU Main Campus
HPRP Energy Production – HPRP
EPTE Energy Production Technology
ENTC Engineering Technology
GENT General Technology
316 Hospitality Management
MATT Machine Tool Technology
240 Magnetic Resonance Imaging**
265 Manufacturing Engineering WMU
MEAS Medical Assisting
MECT Mechatronics Technology
215 Music
NETW Networking
210 Nursing**
PHAR Pharmacy Technician
221 Radiologic Technology**
SKTT Skilled Trades Technology
WDPT Welding Production Technology
WINE Wine & Viticulture Technology

Associate in Science *with a MAJOR in:*
UAST Undecided (Science – Transfer)
061 Biology
064 Chemistry
082 Engineering
053 Health
052 Mathematics
091 Physical Education & Wellness
063 Physical Science
065 Physics

Associate in Arts *with a MAJOR in:*
UAAT Undecided (Arts – Transfer)
031 Art
037 Elementary Education
041 English
042 Foreign Language
395 Graphic Design
021 History
024 Humanities
035 Music (Arts)
022 Philosophy
014 Political Science
012 Psychology
011 Sociology/Social Work
046 Theatre

Associate in General Studies *with a MAJOR in:*
005 General Studies
PDMS Pre-Diagnostic Medical Sonography
PMRI Pre-Magnetic Res Imaging (degree & cert)
PNUR Pre-Nursing (Registered/RN)
PRAD Pre-Radiologic Technology

Associate in Business Administration *with a MAJOR in:*
150 Business Administration

Certificate of Achievement
(Minimum of 30 credit hours)

Certificate majors:
313 Casino Management – Four Winds*/**
CHDE Child Development
165 Cisco
231 Dental Assisting
368 Energy Production Line Worker
315 Hospitality Management
379 Logistics
346 Machine Tool Technology
242 Magnetic Resonance Imaging**
207 Medical Assisting
PHTC Pharmacy Technician
382 Skilled Trades Technology

Level I Certificate
(Maximum of 29 credit hours)

Certificate majors:
GIST Geospatial Information Science and Technology*
394 Graphic Design
INFT Information Technology*
347 Machine Tool*
366 Manufacturing Production*
MCTR Mechatronics Technology*
SACS Sales & Customer Service*
SMBU Small Business Management*
SUSK Supervisory Skills*
SUCM Supply Chain Management*
WEBD Web Development*
WEPT Welding Production Technology*

Non-Degree Seeking*
009 Personal Interest
000 Undeclared

* Not Financial Aid eligible

**Must be accepted into program by the appropriate academic department

Additional Information

Typical Course Loads per Semester
Full-time status: 12+ credits
Three-Quarter-time status: 9-11 credits
Part-time/half-time status: 6-8 credits
Less than half-time status: 1-5 credits

A course load of four to five classes is recommended only if you are working less than 20 hours per week. The maximum credit hours allowed for a 14-week semester is 18.

Many students take summer classes to reduce their course load during the regular school year. Summer term courses at Lake Michigan College are 5- to 14-weeks long.

Maximizing Transfer Credits
In addition to completing your general education requirements, you should complete the coursework outlined in the MTA Transfer Agreement section. You should also begin work in your intended major or area of study. Be sure to learn about the course requirements in your field of study at the college or university to which you plan to transfer.

To make sure you choose appropriate classes at Lake Michigan College, you should:

1. Decide on the field of study you want to pursue and contact the Career and Transfer Center or an academic advisor to get more information.
2. Decide on the college or university you plan to transfer to from Lake Michigan College.
3. Meet with a Lake Michigan College academic advisor to plan your program of study. Academic advisors have up-to-date information about the transferability of Lake Michigan College courses.
4. Check out transfer information at **lakemichigancollege.edu/transfer.**
5. Once you have selected your transfer school, meet with an admissions representative from that school to better understand their admission process and explore college transfer requirements.
6. Apply to the transfer school one year in advance of the expected transfer date. At this time, you should request that a copy of your official transcript from the Office of the Registrar be sent to the transfer school.

Undecided Students
If you know that you want to transfer to a university, but are unsure of what area of study you want to pursue, you should focus on completing the coursework to fulfill the Michigan Transfer Agreement. You should also meet with your Lake Michigan College academic advisor, who can help you plan a solid associate's degree program. With this, you can transfer to a university, and make the most of your time and money at Lake Michigan College. You will also have access to job and career information during your time at Lake Michigan College that will allow you to explore your options. Through the Career and Transfer Center, people with special knowledge of career options can help you explore jobs and your own interests and talents.

College and University Transfer Information

Michigan Transfer Agreement (MTA)
The Michigan Transfer Agreement (MTA) facilitates the transfer of students from community colleges to four-year colleges and universities in Michigan. By carefully choosing courses, students may obtain an associate degree from LMC and complete the MTA; however, students do not need to obtain a degree in order to earn the MTA designation. Students who would like to request the "Michigan Transfer Agreement Satisfied" statement on their transcript should contact the Records Office for an MTA evaluation.
To fulfill the MTA requirements, students must complete at least 30 credits, with at least a "C" (2.00) grade in each course. At least one college-level course must be completed at LMC. All credits will be certified by the LMC Records Office according to the following distribution:

A. English/ Communications
Must take at least two (2) courses:
English 101 or Honors 250 and any one of the following courses: English 102; Honors 251; or Communications 101

B. Mathematics
Must take at least one (1) course:
Mathematics 123, 128, 129, 130, 135, 151, 201, 202, 216, 252; Business Administration 216; Honors 150

C. Natural Sciences
Must take at least two (2) courses from at least two (2) academic disciplines (all Natural Science courses offered at LMC have the required laboratory component):
Agriculture 110
Biology 101, 108, 110, 111, 112, 204, 205, 206, 210, 212; Honors 101, 111, 112
Chemistry 101, 102, 104, 111, 112, 203, 204
Physical Science 101, 104, 205
Physics 101, 102, 104, 201, 202

D. Social Sciences
Must take at least two (2) courses from at least two (2) academic disciplines:
Business Administration (Economics) 200, 203, 204
Geography 100,101, 102
History 101, 102, 201, 202, 204, 205, 207, 209, 210; Honors 214, 215
Political Science 101, 102, 202, 203, 204, 250, 260; Honors 141, 143
Psychology 201, 203, 204, 205, 206, 230, 231, 250; Honors 121, 203, 231
Sociology 101, 201, 202, 204, 205, 210, 250; Honors 130, 209

E. Humanities/ Fine Arts
Must take at least two (2) courses from at least two (2) academic disciplines (Studio or performances courses do not fulfill MTA requirements and are not listed below.):
Art 101, 102, 200, 201, 202, 203, 204
English 201, 203, 204, 205, 206, 208, 209, 210, 211, 214, 215, 216, 217, 220; Honors 204, 208, 256, 258
Foreign Language 101-202 (excluding FORL 123, 124), 211, 212, 221, 222, 251
Humanities 105, 201, 207, 208, 209, 210, 211, 212, 213, 221,294
Music 109, 187, 213, 214
Philosophy 101, 102, 215, 250; Honors 171, 175
Drama 201

Michigan Association of Collegiate Registrars and Admissions Officers (MACRAO) Transfer Agreement

The MACRAO Transfer Agreement was created to simplify your transfer from one institution to another. The agreement stipulates that 30 credit hours of 100-level and above, compatible, general coursework will be granted smooth transferability to participating universities; these credits will be applied toward your general education requirements.

NOTE: Students who matriculate to LMC prior to Fall 2014 may complete the MACRAO endorsement; students who matriculate Fall 2014 (or later) will not be eligible for MACRAO and should pursue the MTA instead. Eligible students will have until Fall 2019 to complete the MACRAO Agreement. Colleges and universities that currently accept MACRAO will continue to do so regardless of date of completion. Students should work closely with their intended transfer institution to determine which endorsement and which courses will best fulfill their academic plans.

The MACRAO Transfer Agreement only addresses general education requirements. Any major and minor requirements and proficiency required of you are determined by each individual four-year school.

When you earn an Associate in Arts, Associate in Science, Associate in Business Administration, or General Education Certificate of Achievement at LMC, your transcript will have the "MACRAO Agreement Satisfied" notation.

If you have not received one of these associate's degrees but you have completed the MACRAO Transfer Agreement requirements as follows, you can have the "MACRAO Agreement Satisfied" notation placed on your transcript by contacting the Records Office.

A. English 101 or Honors 250 **and** English 102 or 103 or Honors 251 – 6 credits

B. Natural Science – 8 credits
- Biology 101, 108, 110, 111, 112, 204, 205, 206, 210, 212; Honors 101, 111
- Chemistry 101, 102, 104, 105, 106, 111, 112, 203, 204
- Physical Science 101, 104, 205
- Physics 101, 102, 104, 201, 202
- Mathematics 122, 123, 128, 129, 130, 135, 151, 201, 202, 216, 252; BUSA 216; Honors 150

At least one course must be a laboratory science course. Courses must be taken in more than one academic discipline.

C. Social Science – 8 to 9 credits
- Business Administration (Economics) 203, 204
- Geography 100, 101, 102
- History 101, 102, 201, 202, 204, 205, 207, 208, 209, 210; Honors 214, 215
- Political Science 101, 102, 202, 203, 204, 250, 260; Honors 141, 143
- Psychology 201, 203, 204, 205, 206, 230, 231, 250; Honors 121, 203, 231
- Sociology 101, 201, 202, 204, 205, 210, 250

Courses must be taken in more than one academic discipline.

D. Humanities – 8 to 9 credits
- Art 101, 102, 200, 201, 202, 203, 204
- English 201, 203, 204, 205, 206, 208, 209, 210, 211, 214, 215, 216, 217, 220; Honors 208, 256, 258
- Foreign Language* 101-202 (excluding FORL 123, 124), 211, 212, 221, 222, 251
- Humanities 105, 201, 207, 208, 209, 210, 211, 212, 213, 221, 294
- Music 109, 187, 213, 214
- Philosophy 101, 102, 215, 250
- Communication 101
- Drama 201

Courses must be taken in more than one academic discipline.

NOTE: See Honors Courses listed under Course Descriptions.

Credit for Experiential Learning (CEL)

We value the experience that you bring with you when you attend Lake Michigan College. You may even be able to earn college credit for some of your experiences and accomplishments outside of the college classroom. The following options are approved pathways for CEL credit:

1) **Portfolio course** – Students may enroll in a credit for experiential learning portfolio course in which the student produces a portfolio of evidence documenting the rationale for their request, as well as evidence of experiential learning. The portfolio course is designed to guide students in analyzing and documenting acquired knowledge that demonstrates college level learning. The portfolio is evaluated by a faculty member in the discipline for which the credit is being requested. Tuition and fees apply.

2) **Council for Adult and Experiential Learning (CAEL)/Learning Counts** Students may submit transcripts from the Council for Adult and Experiential Learning (CAEL) for evaluation by the Registrar's Office. Credit awarded through the evaluation of CAEL transcripts is treated as transfer credit.

   Students may also register for the CAEL 150 Credit for Experiential Learning Portfolio course (tuition and fees of $250 apply). Students must build their portfolio based on the LMC course they are seeking credit for and submit the portfolio for evaluation within six months of the start date of the CAEL 150 course. Students will receive either a pass or fail grade. However, only a passing grade will result in receiving credit for the course the portfolio is based on.

3) **Military training evaluation** – Current and former military service members may submit a military transcript for evaluation by the Registrar's Office. Transcript evaluation is based on recommendations by the American Council on Education (ACE). Credit awarded through the evaluation of military transcripts is treated as transfer credit. There is no charge by the College for this evaluation service.

4) **Nationally standardized assessments** – The College may award credit for certain nationally standardized tests, such as CLEP and DSST. A list of acceptable standardized assessments, required scores, and testing fees is available in the Assessment Center.

5) **Industry-recognized licensing or certification credential** – Industry-recognized credentials are evaluated by a faculty member in the discipline for which the credit is being requested with recommendations to the appropriate Dean or Director for credit equivalencies. A list of common industry-recognized credentials that align with College courses is available in the Advising Office. Fees may apply.

6) **LMC Challenge Exams** – LMC departments may offer departmental challenge exams for some courses. A list of available challenge exams, required scores, and fees (if applicable) is available in the Advising Office and the Assessment Center. Fees may apply.

Notes regarding CEL credit:

- You must be admitted to Lake Michigan College to apply for credit for experiential learning.
- You must complete the "Experiential Learning Credit Request" form.
- Fees may apply and are paid to the Cashier's Office before credit is posted to the transcript.
- Credit is indicated on the transcript as experiential learning credit, the equivalent course and number, and the number of semester hours granted.
- Grades and honor points are not given; therefore, credit for experiential learning does not affect the grade point average. An "N" grade will be assigned to Experiential Learning credits.
- Experiential Learning credit is accepted at Lake Michigan College but may not be transferable to other institutions. If you intend to transfer to another college or university, you should discuss the ramifications of such credit with a Lake Michigan College academic or faculty advisor and your transfer institution.

- Lake Michigan College recognizes the College Board Advanced Placement Program (AP). College course credit may be granted if you have participated in the AP program through your high school. For advanced placement consideration, you must pass the Advanced Placement examinations with a score of three or higher and submit a College Action Report to the Records Office.
- Foreign language credit will be awarded solely on the basis of the results of the CLEP examinations and these rules, regardless of your native language.
- General examinations are not acceptable for transfer credit.
- If you have earned credit for a higher level class at Lake Michigan College and successfully complete a CLEP examination for a lower level course, that credit will NOT be applicable toward transfer credit or graduation credit.

For further information regarding CLEP credit, contact a Student Services academic advisor.

High School Articulation Credit
Lake Michigan College has articulation agreements with many schools and career/technical centers in Berrien, Van Buren, Ottawa, and Allegan counties in Michigan and in St. Joseph County in Indiana. Classes included in the articulation agreements are courses that are taught in high schools or career/technical centers by high school teachers and have a curriculum aligned with an existing class at Lake Michigan College.

If you have taken one of these classes during your high school career, you may be able to earn articulated credit at Lake Michigan College. However, if you plan to transfer to a college or university, you should discuss the transferability of articulated credit with a Lake Michigan College academic or faculty advisor, since this type of credit may not be transferable to other institutions. For further information, contact your high school counselor, the Lake Michigan College Admissions Office, your high school CTE instructor, or the Early Middle College at Lake Michigan College.

Transfer Students
If you are coming to Lake Michigan College from another college or university, you may receive a maximum of 120 transfer credits. College coursework completed with a grade of "C" (2.0) or higher at regionally accredited, post-secondary institutions, may be considered for transfer. If you want prior coursework reviewed for possible transfer credit, apply for admission to Lake Michigan College and have an official transcript of your previous academic transcripts sent to the Records Office. An official transcript is one sent to the Lake Michigan College Records Office directly from the sending institution. The Registrar's Office will only use an official transcript from a regionally accredited institution to evaluate for transfer credit.

Academic Advising
Prior to registering as a new student, you should meet with an academic advisor for assistance in planning your first semester schedule and in creating a student educational plan (SEP). Students placing into two or more transitional studies classes will meet with an academic advisor for success planning prior to registration for each semester until the student meets the E, M, and R proficiencies. Students are encouraged to see an academic advisor anytime they have questions or concerns.

Some specific areas where assistance is provided are:
- Assistance with academic opportunities and choices
- Major selection
- Academic program planning
- Transfer planning
- Referrals for Personal Counseling
- Student resources available on campus, i.e. disability services, grants, career assessment and tutoring. Appointments with an academic advisor should be made through Student Services. Walk-in advising is available on a first-come, first-served basis.

Contact Student Services to schedule an advising session; call **(269) 927-8128** for the Napier Campus, **(269) 695-1391** for the Bertrand Crossing Campus and **(269) 637-7500** for the South Haven Campus.

You are also encouraged to meet with the faculty advisor for your area of study to develop a plan for your major. Faculty office hours are posted on the instructor's door and you are encouraged to make appointments during those hours.

Degree and Certificate Requirements

Graduation
Once you complete the general education and degree requirements for graduation, you will be eligible to apply for the appropriate bachelor's or associate's degree from Lake Michigan College. If you complete the requirements for a certificate program, you will be eligible to apply for a Certificate of Achievement or a Level 1 Certificate. You may graduate at the end of the fall or spring semesters or summer term, with commencement exercises held annually at the close of the spring semester in early May. Participation in commencement does not mean that you have completed all of the requirements for your degree or certificate.

Graduation Requirements
Degree or certificate progress should be tracked using Degree Works; you should also work with an Academic Advisor or Program Advisor to ensure that you are following the best pathway toward degree or certificate completion. You may graduate under the Lake Michigan College catalog in effect at the time of matriculation at Lake Michigan College or any succeeding catalog. However, no student may graduate under the requirements of a catalog that is more than 10 years old. A student who began courses at LMC prior to Fall 1998 may have the Health and Wellness requirement (PHED 200, 212, or 214) waived for the first associate's degree only. The semester credit hour(s) from this waiver must be met in another area to fulfill the total credit hours required for the degree.

Requirements that must be met include:

1. **Admission to Lake Michigan College**

2. **Bachelor Degree:** Satisfactory completion of at least 120 semester hours of credit. Some programs may require more than 120 credit hours. Of these 120 or more total credit hours required for the bachelor degree, a minimum of 30 credit hours must be taken at Lake Michigan College; credits earned through CLEP credit, transfer credit (TR), prior experiential learning (PEL or CAEL), articulated credit (AC), Advanced Placement (AP), or credit by examination will not be counted toward this requirement. The additional 90 or more credit hours may be fulfilled by Lake Michigan College courses*, CLEP, TR, PEL, CAEL 150, AC, AP, and credit by examination.

   Associate Degree: Satisfactory completion of at least 60 semester hours of credit. Some programs require more than 60 credit hours. Of these 60 or more total credit hours required for the associate degree, a minimum of 20 credit hours must be taken at Lake Michigan College; credits earned through CLEP credit, transfer credit (TR), prior experiential learning (PEL or CAEL), articulated credit (AC), Advanced Placement (AP), or credit by examination will not be counted toward this requirement. The additional 40 or more credit hours may be from Lake Michigan College courses*, CLEP, TR, PEL, CAEL 150, AC, AP, and credit by examination.

   Certificate of Achievement: Satisfactory completion of at least 30 semester hours of credit. Some programs require more than 30 credit hours. Of these 30 or more total credit hours required for the Certificate of Achievement, a minimum of 15 credit hours must be taken at Lake Michigan College; credits earned through CLEP credit, transfer credit (TR), prior experiential learning (PEL or CAEL), articulated credit (AC), Advanced Placement (AP), or credit by examination will not be counted toward this requirement. The additional 15 or more credit hours may be from Lake Michigan College courses*, CLEP, TR, PEL, CAEL 150, AC, AP, or credit by examination.

   Level 1 Certificate: Level 1 Certificate is a program with 1 to 29 credit hours that gives you the basic skills that are in demand by local employers. All of the credits can then be applied toward a Certificate of Achievement and toward the appropriate associate degree. Prior experiential learning (PEL or CAEL) credits cannot be used to fulfill Level 1 Certificate requirements.

3. Course credits earned for fulfilling the requirements of any certificate and/or degree must be at the 100-level or above.

Courses with numbers below 100 are graded but not used to compute a student's grade point average or calculated into graduation credit hour requirements.

4. A grade point average of not less than 2.00 (C).

*Lake Michigan College courses are courses which are posted to the student's LMC transcript with a standard letter grade (A, B, C, D, or E); examples may include on-campus, online, hybrid, open-entry/open-exit, open-entry/defined-exit, and Early College courses.

December/Fall Graduation
If you apply for December/Fall graduation, you must complete all program requirements by the end of the fall semester. If you don't complete all program requirements by the end of fall semester, you will have to re-apply for another graduation date. As a December/Fall graduate, you can attend the following year's May commencement ceremony.

December/Fall Graduation Timeline
Applications available Sept. 1.
Last day to apply for December/Fall graduation is the second Friday in November.
Fees may apply.

May/Spring Graduation
If you apply for May/Spring graduation, you can finish any program requirements during the summer term immediately following the spring semester in which you apply. If, as a May/Spring graduate, you have not completed your program requirements by the end of the summer term, you will have to re-apply for another graduation date. May applicants who complete requirements during the summer term will not receive their diploma until after the end of the summer term.

May/Spring Graduation Timeline
Applications available Jan. 1.
Last day to apply for May/Spring graduation is the last Monday in February.
Fees may apply.

August/Summer Graduation
If you apply for August/Summer graduation, you must complete all program requirements by the end of the summer term. If you do not complete all program requirements by the end of the summer term, you will have to re-apply for another graduation date. As an August/Summer graduate, you can attend the following year's May commencement ceremony.

August Graduation Timeline
Applications available May 1.
Last day to apply for August graduation is the second Friday in June.
Fees may apply.

Diplomas
Graduation statements will be posted to your transcripts and your diploma will be mailed approximately 30 days following the date of graduation or completion of all degree/certificate requirements.

Transfer Credit for Graduation
Courses you complete with a grade of 2.0 or better on a 4.0 scale at another regionally accredited college will be accepted when they apply to your program at Lake Michigan College. Transfer credits must be received via an official college transcript mailed directly to Lake Michigan College. The grade point average (GPA) from another college does not affect the Lake Michigan College GPA.

Work-Based Learning
Work-Based Learning at Lake Michigan College gives you the opportunity to gain work-related experience by applying what you learn in the classroom to real-life situations. Local businesses are looking for motivated, responsible LMC students who would benefit from:

- Cooperative education (co-op)
- Internships
- Job shadowing

What is Co-op?
Cooperative education (co-op) combines work experience with college instruction. This unique learning opportunity is designed to develop your skills and provide hands-on experience by combining classroom study with planned, supervised work experience. At LMC, co-op positions can be paid or unpaid and you will earn college credit.

What is an Internship?
An internship gives you the opportunity to gain valuable work experience, build your resume, and network with local professionals in your chosen area of study. At LMC, an internship can be paid or unpaid and you will not earn college credit.

What is Job Shadowing?
Job shadowing is the perfect way for you to explore different career interests by accompanying or shadowing an experienced professional in the field throughout a typical workday. You will gain a better understanding of what it is really like to work in that particular field. At LMC, a job shadowing experience is short-term, unpaid, and does not lead to college credit.

For more information about Work-Based Learning opportunities at LMC, please visit **lakemichigancollege.edu/workandlearn.**

General Education Requirements

AA, AS, and ABA Degrees

2 courses (6 credits) in English/Communications

- Must take English 101 or Honors 250 – AND
- English 102 or Honors 251 – OR – Communication 101

1 course (at least 3 credits) in Mathematics

- Mathematics 123, 128, 129, 130, 135, 151, 201, 202, 216, 252; Business Administration 216

2 courses (at least 8 credits) in Natural Sciences (from at least two academic disciplines)

- Agriculture 110
- Biology 101, 108, 110, 111, 112, 120, 204, 205, 206, 210, 212; Honors 101, 111, 112
- Chemistry 101, 102, 104, 111, 112, 203, 204
- Physical Science 101, 104, 205
- Physics 101, 102, 104, 201, 202

2 courses (at least 6 credits) in Social Sciences (from at least two academic disciplines)

- Must take Political Science 101 or 102 – OR – History 201 or 202
    - 2nd course must be from a different discipline chosen from the following:
    - Business Administration (Economics) 200, 203, 204
    - Geography 100, 101, 102
    - History 101, 102, 201, 202, 204, 205, 207, 209, 210; Honors 214, 215
    - Political Science 101, 102, 202, 203, 204, 250, 260; Honors 141, 143
    - Psychology 201, 203, 204, 205, 206, 230, 231, 250; Honors 121, 203, 231
    - Sociology 101, 201, 202, 204, 205, 210, 250; Honors 130, 209

2 courses (at least 6 credits) in Humanities/Fine Arts (from at least two academic disciplines)

- Art 101, 102, 200, 201, 202, 203, 204
- English 201, 203, 204, 205, 206, 208, 209, 210, 211, 214, 215, 216, 217, 220; Honors 204, 208, 256, 258
- Foreign Language 101-202 (excluding FORL 123, 124), 211, 212, 221, 222, 251; Honors 122, 195, 196
- Humanities 105, 201, 207, 208, 209, 210, 211, 212, 213, 221,294
- Music 109, 187, 213, 214
- Philosophy 101, 102, 215, 250; Honors 171, 175
- Drama 201

*Credit hours listed above are based on the minimum to be earned. For example, MATH courses have 3, 4, or 5 credits. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

1 course (at least 1 credit) in Physical Education & Wellness

- Must take Physical Education 200 or 212 or 214

AAS and AGS Degrees

2 courses (6 credits) in English/Communications

- Must take English 101 (or Honors 250) – AND
- English 102 (or Honors 251) or English 103 or Communication 101

1 course (at least 3 credits) in Mathematics

- Any 100-level course or higher in the Mathematics discipline (including Business Administration 216)

1 course (at least 3 credits) in Natural Sciences

- Any 100-level course or higher in one of the following disciplines:
  - Agriculture (AGRI 110 only)
  - Biology (or Honors 101, 111, 112)
  - Chemistry
  - Physical Science
  - Physics

1 course (at least 3 credits) in Social Sciences

- Must take Political Science 101 or 102 (or Honors 141, 143) – OR – History 201 or 202 (or Honors 214, 215)

1 course (at least 3 credits) in Humanities/Fine Arts

- Any 100-level course or higher in one of the following disciplines:
  - Art
  - Any 200-level English course (or Honors 204, 208, 256, 258)
  - Foreign Language (or Honors 122, 195, 196)
  - Humanities
  - Music
  - Philosophy (or Honors 171, 175)
  - Drama

Additional Associate Degrees

You can earn additional associate degrees when you meet all of the requirements of that particular degree. A minimum of 15 additional semester hours, with at least a "C" (2.00) grade or higher, must be completed at Lake Michigan College and these hours must specifically apply to the additional degree. You may graduate under the Lake Michigan College catalog in effect at the time of initial registration at Lake Michigan College or any succeeding catalog. However, no student may graduate under the requirements of a catalog that is more than 10 years old.

Accounting

Associate in Applied Science Degree *Program Code ACCT*

Advisor: Erick Pifer, (269) 927-5004, pifer@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Math 122, Intermediate Algebra, or
Math 123, Quantitative Reasoning 4
Natural Sciences.....3
Humanities/Fine Arts 3

Major Requirements

Business 201, Principles of Accounting I 4
Business 202, Principles of Accounting II 4
Business 203, Principles of Economics (Macro) 3
Business 204, Principles of Economics (Micro) 3
Business 205, Business Law I.....3
Business 212, Accounting Applications on Computers.....3
Business 213, Cost Accounting I.....3
Business 218, Intermediate Accounting I.....3
Business 219, Intermediate Accounting II.....3
Business 224, Income Tax Accounting.....3
Computer Information Systems 108, Office Information Systems 3

Program Electives (Select 6 Credit Hours)

Business 150, Job Search Seminar 1
Business 210, Business Correspondence.....3
Business 214, Cost Accounting II.....3
Business 265, Accounting Co-Op I 3
Business 266, Accounting Co-Op II 3
Computer Information Systems 100,
Foundations of Information Technology 3

You should notify your advisor of your intention to take BUSA 265 and BUSA 266 before beginning your second-year classes.

About the Area of Study

With a two-year degree in accounting, you will be prepared for entry-level accounting positions including bookkeeper, accounts payable, payroll clerk, or assistant to an accountant. You will compute, classify, record, and verify financial data, and develop and maintain financial records.

Associate Degree

Upon completion of the 61-credit Accounting program, you may apply for an Associate in Applied Science degree.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer.**

Sample Program Sequences

An advisor will help you make necessary changes to these recommended sequences.

Associate Degree Program

Semester 1	**Semester 2**	**Semester 3**
BUSA 201	BUSA 202	BUSA 203
CIS 108	BUSA 212	BUSA 205
ENGL 101	ENGL 102	BUSA 218
MATH 122 or MATH 123	Humanities/ Fine Arts	BUSA 224

Semester 4	**Semester 5**
BUSA 204	Elective
BUSA 213	Natural Science
BUSA 219	
POSC 101 or POSC 102 or HIST 201 or HIST 202	
Elective	

Art

Associate in Art Degree – TRANSFER PROGRAM *Program Code 031*

Advisor: Brandon Pierce, (269) 927-8767, pierce@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
**Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
**Mathematics.....3
*Natural Sciences.....8
*Social Sciences.....3
*Humanities/Fine Arts.....6

Major Requirements

At least one course in ART 3
General Electives.....27

The following Art classes are offered at LMC:

Art 101, Art Appreciation I.....3
Art 102, Art Appreciation II.....3
Art 105, Watercolor I 2
Art 106, Watercolor II 2
Art 109, Basic Design (2-D) 3
Art 110, Basic Design (3-D) 3
Art 111, Art Education.....3
Art 115, Painting I 3
Art 116, Painting II 3
Art 120, Ceramics I 3
Art 121, Ceramics II 3
Art 122, Drawing I.....3
Art 123, Drawing II.....3
Art 130, Beginning Glassblowing 3
Art 200, History of Art I.....3
Art 201, History of Art II 3
Art 202, 20th Century Art.....3
Art 203, 20th Century Art History: 1900-1945 3
Art 204, 20th Century Art History 1945-present 3
Art 212, Sculpture I 3
Art 213, Sculpture II.....3
Art 251, Studio Problems: Painting 3
Art 252, Studio Problems: Ceramics.....3
Art 253, Studio Problems: Sculpture 3
Art 254, Studio Problems: Watercolor 2
Art 260, Studio Problems: Drawing.....3

*From at least two academic disciplines.

**Credit hours listed are based on minimum earned. For example, MATH

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

Study and courses in Art can help you develop an appreciation for the visual arts as well as expand your expertise and understanding in the field. You will study art theory and history, and work directly with a given medium in a studio environment in coursework such as Design, Drawing, Painting, Photography, Ceramics, Glassblowing Printmaking, Weaving and Sculpture.

Also of great importance will be building your portfolio that represents all of your work prior to transfer. Students who complete this program will receive an Associate in Arts degree. Courses are open to all students.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer.**

Biology

Associate in Science Degree – TRANSFER PROGRAM *Program Code 061*

Advisors: Dr. Jessica Beachy. (269) 927-8878, jbeachy@lakemichigancollege.edu
Dr. Melissa Howse-Kurtz, (269) 927-8623, mhowse@lakemichigancollege.edu
Dr. Susan Lentz, (269) 927-8624, lentz@lakemichigancollege.edu
Dr. Fran Miles, (269) 927-1000 ext. 7157, miles@lakemichigancollege.edu
Frank Stijnman, (269) 927-8862, stijnman@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
**Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
Mathematics 151, Calculus I 5
Biology 111, Principles of Biology I 4
Chemistry 111, General Chemistry I 4
Social Sciences 3
*Humanities/Fine Arts 6

Major Requirements

Biology 112, Principles of Biology II 4
Chemistry 112, General Chemistry II 4
Students are required to take 2 out of the 4 following Biology classes:
Biology 205, Human Anatomy, or
Biology 206, Human Physiology, or
Biology 210, Microbiology, or
Biology 212, Genetics 8
General Electives 12

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

Biology deals with living organisms and vital processes, including microbial, plant, and animal life. Your study in Biology may include coursework in areas such as Environmental Biology, Plant Biology, Ecology, Evolution, Human Anatomy, Human Physiology, Cell Biology, Molecular Biology, Biotechnology, Microbiology, and Genetics.

A Biology concentration consists of a minimum of 16 hours of coursework in the discipline.

There is a 60-credit degree requirement needed for graduation.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Business Administration

Associate in Business Administration Degree – TRANSFER PROGRAM

Program Code 150

Advisors: Lisa Augustyniak, (269) 927-7181, augustyn@lakemichigancollege.edu
Erick Pifer, (269) 927-1000 ext. 5004, pifer@lakemichigancollege.edu
Joe Zwiller, (269) 927-1000 ext. 5003, jzwiller@lakemichigancollege.edu

---

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 3
Mathematics 128, Pre-Calculus Algebra, or
Mathematics 129, Finite Mathematics 4
Business 203, Principles of Economics (Macro) 3
Humanities/Fine Arts 6
Natural Sciences 6

Major Requirements

Business 103, Introduction to Business 3
Business 201, Principles of Accounting 4
Business 202, Principles of Accounting II 4
Business 204, Principles of Economics (Micro) 3
Business 209, Principles of Marketing 3
Business 215, Business Communication 3
Business 216, Business Statistics 3
Business 220, Organizational Behavior 3
Computer Information Systems 108, Office Information Systems 3
Computer Information Systems 202, Data Reporting andAnalysis 3

About the Area of Study

The Business Administration program is a transfer program that will help you learn business and communication principles that can lead to careers in accounting, economics, finance, general business, management, marketing, human resource administration and public relations.

Associate Degree

Upon completion of the 63-credit hour Business Administration program, you may apply for an Associate in Business Administration degree.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Sample Program Sequences

An advisor will help you make necessary changes to this recommended sequence.

Associate's Degree Program

Semester 1	**Semester 2**
BUSA 103	MATH 129
CIS 108	ENGL 102
ENGL 101	HUMANITIES
HUMANITIES	PHSC 101
BIOL 101	CIS 202

Semester 3	**Semester 4**
BUSA 201	BUSA 202
BUSA 215	BUSA 209
BUSA 216	BUSA 204
POSC 101	BUSA 220
BUSA 203	PHED 200

Business

Associate in Applied Science Degree *Program Code BUSI*

Advisor: Joe Zwiller, **(269) 927-1000 ext. 5003**, jzwiller@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition..... 3
English 102, English Composition, or
English 103, Technical Writing, or..... 3
Communication 101, Introduction to Public Speaking..... 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History..... 3
Mathematics 123, Quantitative Reasoning..... 4
Natural Science..... 3
Humanities/Fine Arts 3

Major Requirements

Business 101, Business Accounting I, or
Business 201, Principles of Accounting I 3
Business 103, Introduction to Business..... 3
Business 203, Principles of Economics (Macro)..... 3
Business 209, Principles of Marketing 3
Business 215, Business Communication 3
Business 216, Business Statistics..... 3
Computer Information Systems 202, Data Reporting & Analysis 3
Computer Information Systems 108, Office Information Systems, or
Office Information Systems 114, Computer Applications I 3
Mathematics 129, Finite Mathematics 4

Program Electives (15 credits)

Sales & Customer Service Track

Business Administration 104, Salesmanship 3
Business Administration 105, Retailing 3
Business Administration 115, Principles of Customer Service..... 3
Business Administration 207, Small Business Management 3
Business Administration 261, Distributive Ed Co-op I, or
Business Administration 262, Distributive Education Co-op II, or
Program Advisor Approved Elective..... 3

Small Business Management Track

Business Administration 104, Salesmanship 3
Business Administration 115, Principles of Customer Service..... 3
Business Administration 205, Business Law I..... 3
Business Administration 207, Small Business Management 3
Business Administration 261, Distributive Ed Co-op I, or
Business Administration 262, Distributive Education Co-op II, or
Program Advisor Approved Elective..... 3

Supervisory Skills Track

Business Administration 108, Supervisory Skills..... 3
Business Administration 115, Principles of Customer Service..... 3
Business Administration 225, Personnel Management 3
Business Administration 261, Distributive Ed Co-op I, or
Business Administration 262, Distributive Education Co-op II, or
Program Advisor Approved Elective..... 3
Psychology 201, Introduction to Psychology 3

Supply Chain Management Track

Logistics 101, Introduction to Logistics 3
Logistics 102, Warehouse and Distribution 3
Logistics 103, Traffic and Transportation..... 3
Logistics 104, Rules and Regulations 3
Logistics 105, Logistics Technology 3

About the Area of Study

The A. A. S. in Business program prepares graduates for entry-level and managerial positions in business. The emphasis is on preparing professionals who will contribute immediately in an office environment. For those students currently employed, the degree can provide the foundation for future growth in their business careers. The program is designed to help students develop functional business knowledge, apply professional and effective business communication, develop analytical and problem solving skills, understand and use computer-based information systems, recognize and analyze ethical problems, exhibit professional behaviors, and acquire an appreciation for diverse perspectives. Students find employment across a wide spectrum of industries in entry-level and managerial positions that can represent customer service, sales, administration, and executive assistants.

Degree Options

By completing the 64+-credit program in Business, you may apply for an Associate in Applied Science degree.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Sample Program Sequences

An advisor will help you make necessary changes to this recommended sequence.

Associate's Degree Program

Semester 1	Semester 2
BUSA 103	ENGL 102
ENGL 101	MATH 129
Elective	Humanities
MATH 123	CIS 202
CIS 108	Elective

Semester 3	Semester 4
BUSA 201	BUSA 209
BUSA 215	BUSA 203
BUSA 216	Elective
PHSC 101	Elective
Elective	POSC 101

NOTE: You should notify your program advisor and the co-op coordinator of your intention to take BUSA 261, 262, 263, or 264 before beginning your second-year classes.

Business

Level 1 Certificate – Sales and Customer Service *Program Code SACS*
Level 1 Certificate – Small Business Management *Program Code SMBU*
Level 1 Certificate – Supervisory Skills *Program Code SUSK*
Level 1 Certificate – Supply Chain Management *Program Code SUCM*

Advisor: Student Services Academic Advising Appointments, (269) 927-8128

Certificate Requirements ..... Credit Hours

Sales & Customer Service Certificate

Business Administration 104, Salesmanship 3
Business Administration 105, Retailing 3
Business Administration 115, Principles of Customer Service 3
Business Administration 207, Small Business Management 3
Business Administration 261, Distributive Ed Co-op I, or
Business Administration 262, Distributive Education Co-op II, or
Program Advisor Approved Elective 3

Small Business Management Certificate

Business Administration 104, Salesmanship 3
Business Administration 115, Principles of Customer Service 3
Business Administration 205, Business Law I 3
Business Administration 207, Small Business Management 3
Business Administration 261, Distributive Ed Co-op I, or
Business Administration 262, Distributive Education Co-op II, or
Program Advisor Approved Elective 3

Supervisory Skills Certificate

Business Administration 108, Supervisory Skills 3
Business Administration 115, Principles of Customer Service 3
Business Administration 225, Personnel Management 3
Business Administration 261, Distributive Ed Co-op I, or
Business Administration 262, Distributive Education Co-op II, or
Program Advisor Approved Elective 3
Psychology 201, Introduction to Psychology 3

Supply Chain Management Certificate

Logistics 101, Introduction to Logistics 3
Logistics 102, Warehouse and Distribution 3
Logistics 103, Traffic and Transportation 3
Logistics 104, Rules and Regulations 3
Logistics 105, Logistics Technology 3

Casino Management – Four Winds

Certificate of Achievement *Program Code 313*

Associate in Applied Science Degree *Program Code 314*

Advisor: Chris Woodruff, (269) 927-8868, woodruff@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 103, Technical Writing, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Mathematics 123, Quantitative Reasoning 4
Natural Sciences 3
Humanities/Fine Arts 3

Major Requirements

*Business 103, Introduction to Business 3
Business 115, Principles of Customer Service 3
*Business 201, Principles of Accounting I 4
Business 203, Principles of Economics (Macro) 3
*Business 211, Principles of Management 3
*Business 220, Organizational Behavior 3
*Hospitality Management 201, Restaurant Operations 3
*Hospitality Management 202, Introduction to Casino Management 3
*Hospitality Management 251, Marketing of Hospitality Services 3
Hospitality Management 252, Supervisory Skills & Human Relations 3
*Hospitality Management 253, Tourism 3
Hospitality Management 254, Hospitality Cost Control Systems 3
*Hospitality Management 255, Hotel Management & Operations 3
Psychology 201, Introduction to Psychology, or
Sociology 101, Principles of Sociology 3

*Classes Required for Certificate Program

About the Area of Study

Graduates of the Casino Management Program may select from a variety of management and staff related careers in gaming, marketing, security and surveillance, hotels, resorts, restaurants, and event planning.

Some careers include assistant casino manager, table games manager, slot machines manager, director of security, director of surveillance, and convention services manager. In all of these positions, strong guest service, leadership, human resources, problem solving, and math skills are required.

Certificate & Associate Degree

Upon completion of the 30-credit program, you may apply for a Certificate of Achievement.

Upon completion of the 62-credit program, you may apply for an Associate in Applied Science degree. Certificate requirements may be applied to the degree program.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Certificate Program

Semester 1	Semester 2
COMM 101	HOSP 111
HOSP 110	HOSP 117
HOSP 115	HOSP 153
HOSP 150	HOSP 200
HOSP 251	HOSP 201
HOSP 252	HOSP 250
HOSP 255	HOSP 254

Associate Degree Program

Semester 1	Semester 2	Semester 3
ENGL 101	ENGL 102 or	HOSP 115
HOSP 150	ENGL 103 or	HOSP 251
HOSP 110	COMM 101	HOSP 252
COMM 101	HOSP 117	HOSP 255
HOSP 111	HOSP 201	HOSP 275
HOSP 153		BUSA 201

Semester 4	
POSC 101 or	HOSP 200
POSC 102 or	HOSP 201
HIST 201 or	HOSP 253
HIST 202	HOSP 254

Chemistry

Associate in Science Degree – TRANSFER PROGRAM *Program Code 064*

Advisors: Dr. Bal Barot, (269) 927-8754, barot@lakemichigancollege.edu
Dr. John Beck, (269) 927-1000 ext. 2986, jbeck@lakemichigancollege.edu
Leah Parkinson (269) 927-8769, lparkinson@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
**Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
Mathematics 151, Calculus I 5
Biology 111, Principles of Biology I 4
Chemistry 111, General Chemistry I 4
*Social Sciences 3
*Humanities/Fine Arts 6

Major Requirements

Chemistry 112, General Chemistry II 4
Chemistry 203, Organic Chemistry I 4
Chemistry 204, Organic Chemistry II 4
Mathematics 201, Calculus II 5
Physics 201, Engineering Physics I 5
Physics 202, Engineering Physics II 5
General Electives 1

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

Chemistry deals at the atomic level with the material of which the world is composed. As a chemist, you will study these materials along with their compositions, structures, and changing properties. Hands-on laboratory experiences will allow you to develop experimental techniques and provide you with opportunities to apply the chemical principles that you have learned. Industry, agriculture, education, medicine, and government offer opportunities for employment in chemistry. There is a 60-credit degree requirement needed for graduation.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **www.lakemichigancollege.edu/transfer.**

Child Development

Certificate of Achievement – Child Development *Program Code CHDE*

Associate in Applied Science Degree – TRANSFER PROGRAM *Program Code CHDV*

Advisors: Erika Milovich, (269) 927-6739, emilovich@lakemichigancollege.edu
Student Services Academic Advising, (269) 927-8128

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition.....3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Mathematics 3
Natural Science 3
Music 200, Music for the Elementary Teacher 3

Major Requirements

Art 111, Art Education.....3
Computer Information Systems 100,
Foundations of Information Technology, or
Computer Information Systems 106,
Operating System Foundations, or
Computer Information Systems 108, Office Information Systems, ...3
Early Childhood 110, Introduction to Child Development.....3
Early Childhood 111, Early Childhood Learning Environments..... 2
Early Childhood 112, Curriculum Planning for the Young Child 3
Early Childhood 113, Guiding Young Children's Social Development 3
Early Childhood 210, Curriculum Planning for the Young Child II.....3
Early Childhood 211, Diversity in Child Development.....3
Early Childhood 212, Administration of Early Childhood Programs 3
Early Childhood 213, Current Issues in Early Childhood Education.....3
Psychology 201, Introduction to Psychology 3
Psychology 203, Human Development.....3
General Electives 7

About the Area of Study

The need for early childhood educators is growing faster than average. At Lake Michigan College, students can join this growing field by earning a Certificate of Achievement or Associate in Applied Science degree. This program can also help prepare students for the Childhood Development Associate (CDA) credential awarded through the Council for Early Childhood Professional Recognition.

Child Development is a field of study that prepares professionals to provide care and education for children from birth through age eight. Professionals in this field provide interactions and learning experiences that promote the young child's intellectual, social, emotional, and physical growth and development. LMC's program prepares students to teach in and direct child care centers, Head Start programs, and part-day preschools; and to serve as Pre-K to 3rd grade teacher aides in public schools. Students are involved in a variety of field experiences with infants, toddlers, preschoolers, and early elementary children.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. The curriculum for students planning to transfer to a 4-year institution varies considerably. LMC has developed articulation agreements/partnerships with many colleges and universities. Agreements are designed to facilitate the transfer of credits from LMC to these Colleges of Education. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer.**

Computer Information Systems

Level 1 Certificate – Information Technology *Program Code INFT*

Level 1 Certificate – Web Development *Program Code WEBD*

Advisors: Shawn Hisle, (269) 927-8166, shisle@lakemichigancollege.edu
Jay Keeler, (269) 927-8772, jkeeler@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

Information Technology

Computer Information Systems 106, Operating Systems Foundations 3
Computer Information Systems 100,
Foundations of Information Technology, or
Computer Information Systems 108, Office Information Systems 3
Computer Information Systems 118, Web Dev. & Design Foundations 3
Computer Information Systems 119, Programming Logic and Design.....3
Computer Information Systems 140, Network Foundations 3
Computer Information Systems 156, Computer Security 3
Computer Information Systems 200, IT Support 3
Computer Information Systems 240, Systems Analysis & Design.....3

Web Development

Computer Information Systems 100,
Foundations of Information Technology 3
Computer Information Systems 111, Database Systems 3
Computer Information Systems 118, Web Dev. & Design Foundations 3
Computer Information Systems 119, Programming Logic and Design, or
Computer Information Systems 164, C++ Programming 3
Computer Information Systems 219, Client-Side Web Development.....3
Computer Information Systems 220, Web Programming.....3
Computer Information Systems 221, Server-Side Scripting.....3

About the Area of Study
Information Technology

The CIS Information Technology option emphasizes the overall business support function of computer information systems. It can lead to careers working a help desk and computer support specialist.

Level I Certificate Program

Semester 1	Semester 2
CIS 100 or 108	CIS 106
CIS 119	CIS 118
CIS 140	CIS 156
CIS 200	CIS 240

About the Area of Study
Web Development

The Web Development certificate is offered as a stand-alone program or a complement to several degree programs. This program will allow you to develop skills in a variety of popular Web design and programming languages. Web Designers and Programmers can be found in almost every industry including telecommunications, financial institutions, educational institutions, government agencies, and management firms. Web Design and Maintenance are regular features of any business whether large or small.

Level I Certificate Program

Semester 1	Semester 2	Semester 3
CIS 100	CIS 219	CIS 221
CIS 111	CIS 220	
CIS 118		
CIS 119		

Semester 3	Semester 4
CIS 239	CIS 278
CIS 277	CIS 279

Computer Information Systems

Certificate of Achievement – CISCO *Program Code 165*

Level 1 Certificate – Geospatial Information Science & Technology

Program Code GIST

Advisors: Shawn Hisle, (269) 927-8166, shisle@lakemichigancollege.edu
Jay Keeler, (269) 927-8772, jkeeler@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

CISCO

Computer Information Systems 100,
Foundations of Information Technology, or
Computer Information Systems 106,
Operating System Foundations, or
Computer Information Systems 108, Office Information Systems 3
Computer Information Systems 140, Network Foundations 3
Computer Information Systems 155, Comparative Operating Systems 3
Computer Information Systems 156, Computer Security 3
Computer Information Systems 200, IT Support 3
Computer Information Systems 226, Routing & Switching 3
Computer Information Systems 227, Connecting Networks.....3
Computer Information Systems 228, Scaling Networks 3
Computer Information Systems 242, Windows Server.....3
English 101, English Composition 3

Geospatial Information Science & Technology

Computer Information Systems 158, Geospatial Technologies.....3
Computer Information Systems 237, Geographic Information Systems 3
Computer Information Systems 238, Remote Sensing 3
Computer Information Systems 239, Field Methods in GIS.....3
Computer Information Systems 277, Advanced GIS 3
Computer Information Systems 278, GeoDatabase Design & Web GIS 3
Computer Information Systems 279, GIS Customization & Programming...3

About the Area of Study CISCO

The CIS CISCO option will allow you to develop skills using the defacto network standard throughout the world. This certificate aligns students for the following professional certifications: Comptia A+/Security+, Cisco CCENT/CCNA, and Microsoft MCSA.

Level I Certificate Program

Semester 1	Semester 2
CIS 100 or	CIS 155
106 or 108	CIS 226
CIS 140	
CIS 200	

Semester 3	Semester 4
CIS 156	CIS 227
CIS 228	CIS 242

About the Area of Study GIST

Identified by the US Department of Labor as one of the top three growth sectors in the workplace, GIST provides multi-disciplinary tools to collect, manage, analyze and present information that is spatial, or has a "where" component. This certificate is offered as a stand-alone program or a complement to several degree programs.

Applications include business and marketing analysis, demographic studies, emergency management, urban planning, crimes analysis, homeland security, and natural resource management. Because uses for Geospatial Technology are so widespread and diverse, the market is growing at an annual rate of over 35%, with the commercial subsection of the market expanding at the rate of over 100 percent each year (Source: Geospatial Information & Technology Association).

Level I Certificate Program

Semester 1	Semester 2
CIS 158	CIS 237
	CIS 238

Semester 3	Semester 4
CIS 239	CIS 278
CIS 277	CIS 279

Computer Information Systems

Associate in Applied Science Degree – Applications Development *Program Code APDV*

Advisors: Jay Keeler, **(269) 927-8772**, jkeeler@lakemichigancollege.edu
Shawn Hisle, **(269) 927-8166**, shisle@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
English 103, Technical Writing 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Math 123, Quantitative Reasoning, or higher,
excluding MATH 200, MATH 210 or MATH 265 3
Natural Sciences 3
Humanities/ Fine Arts 3

Major Requirements

Computer Information Systems 100,
Foundations of Information Technology, or
Computer Information Systems 108, Office Information Systems 3
Computer Information Systems 106, Operating System Foundations 3
Computer Information Systems 118, Web Dev. & Design Foundations 3
Computer Information Systems 119, Programming Logic and Design 3
Computer Information Systems 140, Network Foundations 3
Computer Information Systems 156, Computer Security 3
Computer Information Systems 164, C++ Programming 3
Computer Information Systems 240, Systems Analysis & Design 3
Computer Information Systems 264, Advanced C++ Programming 3
Computer Information Systems 266, Java Programming 3
Computer Information Systems 268, C# Programming 3
Computer Information Systems 291, Software Engineering 3

Electives (Select 8 Credit Hours)

Computer Information Systems 111, Database Systems 3
Computer Information Systems 155, Comparative Operating Systems 3
Computer Information Systems 158, Geospatial Technologies 3
Computer Information Systems 170, Unix/Linux Operating Systems 3
Computer Information Systems 200, IT Support 3
Computer Information Systems 202, Data Reporting & Analysis 3
Computer Information Systems 208, Adv. Microcomputing Apps 3
Computer Information Systems 219, Client-Side Web Development 3
Computer Information Systems 220, Web Programming 3
Computer Information Systems 221, Server-Side Scripting 3
Computer Information Systems 226, Routing & Switching 3
Computer Information Systems 227, Connecting Networks 3
Computer Information Systems 228, Scaling Networks 3
Computer Information Systems 237, Geographic Information Systems 3
Computer Information Systems 238, Remote Sensing 3
Computer Information Systems 239, Field Methods in GIS 3
Computer Information Systems 242, Windows Server 3
Computer Information Systems 250, Adv. Topics/Comp. Info. Syst. 3
Computer Information Systems 255, Structured Query Language 3
Computer Information Systems 261, Co-Op I 3
Computer Information Systems 262, Co-Op II 3
Computer Information Systems 277, Advanced GIS Application 3
Computer Information Systems 278, Web GIS/GeoDatabase Design 3
Computer Information Systems 279, GIS Customization & Programming 3

About the Area of Study

Information technology (IT) professionals are in consistently high demand, and those who can apply their technical and problem-solving skills in Application Development (programming) can look forward to some of the highest entry-level and median incomes among all career areas.

Hands-on learning opportunities are provided in computer labs using state-of-the-art equipment, and commercial development tools. Students learn how to read and write code, the elements of program design, prototyping, debugging, revision control, compliance, quality assurance, and project management.

The curriculum is grounded in current technology, based on market demand, and aligned with third-party certification. The core program establishes a solid theoretical foundation, yet provides room for electives that allow the student to focus on areas such as Databases, Geospatial Information Science, Networking, Operating Systems, or Web Development.

Associate Degree

When you complete the 62-credit program, you may apply for an Associate in Applied Science degree.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your CIS Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer.**

Sample Program Sequences

A CIS advisor will help you make necessary changes to these recommended sequences.

Associate Degree Program

Semester 1	**Semester 2**
CIS 100 or 108	CIS 118
CIS 106	CIS 156
CIS 119	CIS 164
CIS 140	ENGL 102 or 103
ENGL 101	MATH 123 or higher

Semester 3	**Semester 4**
CIS 264	CIS 240
CIS 266	CIS 268
CIS Elective	CIS 291
Social Science	CIS Elective
Natural Science	Humanities/Fine Arts

Computer Information Systems

Associate in Applied Science Degree - Networking *Program Code NETW*

Advisors: Shawn Hisle, **(269) 927-8166**, shisle@lakemichigancollege.edu
Jay Keeler, **(269) 927-8772**, jkeeler@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Math 123, Quantitative Reasoning or higher
Excluding MATH 200, MATH 210 or MATH 265 3
Natural Sciences.....3
Humanities/Fine Arts 3

Major Requirements

Computer Information Systems 100,
Foundations of Information Technology, or
Computer Information Systems 108, Office Information Systems 3
Computer Information Systems 106, Operating System Foundations 3
Computer Information Systems 118, Web Dev. & Design Foundations 3
Computer Information Systems 119, Programming Logic and Design, or
Computer Information Systems 164, C++ Programming 3
Computer Information Systems 140, Network Foundations 3
Computer Information Systems 155, Comparative Operating Systems 3
Computer Information Systems 156, Computer Security 3
Computer Information Systems 226, Routing & Switching 3
Computer Information Systems 227, Connecting Networks.....3
Computer Information Systems 228, Scaling Networks 3
Computer Information Systems 240, Systems Analysis & Design.....3
Computer Information Systems 242, Windows Server.....3

Electives (Select 8 Credit Hours)

Computer Information Systems 111, Database Systems 3
Computer Information Systems 158, Geospatial Technologies 3
Computer Information Systems 170, Unix/Linux Operating Systems 3
Computer Information Systems 200, IT Support.....3
Computer Information Systems 202, Data Reporting & Analysis 3
Computer Information Systems 208,
Intermediate Office Information Systems.....3
Computer Information Systems 219, Client-Side Web Development 3
Computer Information Systems 220, Web Programming 3
Computer Information Systems 221, Server-Side Scripting 3
Computer Information Systems 237, Geographic Information Systems 3
Computer Information Systems 238, Remote Sensing 3
Computer Information Systems 250, Selected Topics in CIS 3
Computer Information Systems 255, Structured Query Language 4
Computer Information Systems 261, Co-Op I 3
Computer Information Systems 262, Co-Op II 3
Computer Information Systems 264, Advanced C++ Programming 3
Computer Information Systems 266, Java Programming 3
Computer Information Systems 268, C# Programming 3

About the Area of Study

Students preparing for a career in information technology learn analytical and critical thinking skills, as well as the technical skills necessary to be successful IT professionals. At Lake Michigan College, hands-on learning opportunities are provided in computer labs using state-of-the-art hardware and software. In addition, students build important soft skills such as interpersonal communications, problem-solving, team-building, and project management.

Associate Degree

When you complete the 60-credit program, you may apply for an Associate in Applied Science degree.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer.**

Sample Program Sequences

A CIS advisor will help you make necessary changes to these recommended sequences.

Associate Degree Program

Semester 1	**Semester 2**
CIS 100 or 108	CIS 118
CIS 106	CIS 156
CIS 119	CIS 226
CIS 140	ENGL 102 or 103
ENGL 101	MATH 123 or higher

Semester 3	**Semester 4**
CIS 155	CIS 227
CIS 228	CIS 240
CIS Elective	CIS 242
Social Science	CIS Elective
Natural Science	Humanities/Fine Arts

Computer Science

Associate in Applied Science Degree *Program Code COSC*

Advisors: James Larson, (269) 927-8962 ext. 5148, larson@lakemichigancollege.edu
Shawn Hisle, (269) 927-8166, shisle@lakemichigancollege.edu
Jay Keeler, (269) 927-8772, jkeeler@lakemichigancollege.edu

Degree Requirements.....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
English 103, Technical Writing, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Mathematics 151, Calculus I 5
Chemistry 111, General Chemistry 4
Humanities/Fine Arts 3

Major Requirements

Computer Information Systems 164, C++ Programming 4
Computer Information Systems 264, Advanced C++ Programming 3
Engineering 113, Engineering Design & Graphics 4
Mathematics 201, Calculus II 5
Mathematics 202, Calculus III 5
Mathematics 252, Differential Equations 4
Philosophy 102, Introduction to Logic 3
Physics 201, Engineering Physics I 5
Physics 202, Engineering Physics 5
Elective 1-3

About the Area of Study

Students preparing for a career in information technology learn analytical and critical thinking skills, as well as the technical skills necessary to be successful IT professionals. At Lake Michigan College, hands-on learning opportunities are provided in computer labs using state-of-the-art hardware and software. In addition, students build important soft skills such as interpersonal communications, problem-solving, team-building, and project management.

Associate Degree

When you complete the 60-credit program, you may apply for an Associate in Applied Science degree.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Sample Program Sequences

An advisor will help you make necessary changes to these recommended sequences.

Associate Degree Program

Semester 1	**Semester 2**
ENGL 101	ENGL 102 or 103
MATH 151	MATH 201
ENGR 113	Humanities/Fine Arts
PHIL 102	CIS 119 - Elective
Semester 3	**Semester 4**
CIS 164	CIS 264
MATH 202	MATH 252
PHYS 201	PHYS 202
POSC 101	CHEM 111

Criminal Justice

Associate in Applied Science Degree *Program Code CRJU*

Advisors: Chris Woodruff, (269) 927-8868, woodruff@lakemichigancollege.edu
Student Services Academic Advising, (269) 927-8128

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Mathematics 123, Quantitative Reasoning 4
Humanities/Fine Arts 3
Natural Sciences 3

Major Requirements

*Corrections 160, Introductions to Corrections 3
*Corrections 161, Institutional Operations 3
*Corrections 162, Institutional Populations 3
*Corrections 163, Concepts of Rehabilitation 3
*Corrections 164, Legal Issues in Corrections 3
Corrections 264, Case Studies in Rehabilitation 3
Law Enforcement 140, Introduction to Criminal Justice 3
Law Enforcement 142, Police Organization and Administration 3
Law Enforcement 144, Criminology 3
Law Enforcement 250, Juvenile Delinquency and Behavior 3
Law Enforcement 251, Seminar in Criminal Justice and Public Safety 3
Law Enforcement 252, Criminal Procedures 3
Psychology 201, Introduction to Psychology 3
Sociology 101, Principles of Sociology 3

You may select a Law Enforcement or Corrections course as a program elective. Before taking Seminar in Criminal Justice and Public Safety, please see the program advisor.

*Courses needed for the Corrections Officer Academic Certificate program.

About the Area of Study

The Corrections track trains students for jobs in corrections, probation, parole, law enforcement, and related fields. The certificate program is for those interested in an entry-level position in corrections. These are typically found at county, state, or federal jails, prisons, or juvenile centers.

The Law Enforcement track is designed to give you a broad base of general education along with specific skills and knowledge in the field of law enforcement. The program is designed to prepare students for a technical career upon graduation.

The associate's degree program is a transfer program. If you are interested in a career in probation or parole, you will need to pursue a bachelor's degree.

Sample Program Sequences

An advisor will help you make necessary changes to this recommended sequence.

Associate Degree

Upon completion of the 61-credit hour Criminal Justice program, you may apply for an Associate in Applied Science degree.

Semester 1	**Semester 2**
ENGL 101	ENGL 102
LAWE 142	SOC 101
CORR 160	CORR 162
CORR 161	CORR 264
Humanities	CORR 164
	LAWE 140

Semester 3	**Semester 4**
PSYC 201	POSC 101 or
SOC 201	POSC 102 or
CORR 163	HIST 201 or
MATH 123	HIST 202
Natural Science	LAWE 250
	LAWE 251
	LAWE 252

Certificate & Degree Program

Upon completion of the 15-credit Corrections, program, you may apply for a Corrections Officer Academic Certificate through the Business Department.

Semester 1	**Semester 2**
CORR 160	CORR 162
CORR 161	CORR 164
CORR 163	

Criminal Justice - continued

Transfer Options

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements.

This program will transfer on a 3 + 1 basis to Ferris State University. Transferability to other four-year institutions in Michigan may be possible.

See your Academic Advisor for assistance in developing your Student Education Plan or visit https://www.lakemichigancollege.edu/transfer for more information on transferring.

Employment

Employment in Law Enforcement is subject to the employment standards for each state. For Michigan Law Enforcement Standards please visit: http://www.michigan.gov/mcoles/0,4607,7-299--150169--,00.html. If you have questions about these standards, please contact an Academic Advisor prior to starting the Criminal Justice program.

**Students must take and pass the MCOLES Reading and Writing test and the Physical Skills test prior to tracking in semester III.

To be hired as a Corrections Officer, you must comply with the following State of Michigan requirements:

1. Before being hired, an applicant must pass a physical fitness test given by the Michigan Department of Corrections (MDOC).
2. An applicant must have acceptable vision, hearing, general good physical health, and pass a drug screen.
3. Any individual who has been convicted of a felony cannot be hired, in accordance with Pubic Act 140 of 1996. In addition, no individual can be hired who has pending felony or misdemeanor charges (includes deferred sentences), or who has a controlled substance violation in any jurisdiction, including military controlled substance-related discharges. In addition, an individual who has been convicted of any misdemeanor shall not be eligible for employment until one year after satisfactorily completing any sentence imposed, including probation. Also, an individual who has been convicted of domestic violence cannot be hired into any position which requires the possession or use of weapons or ammunition. Any individual hired into a position by the Department of Corrections must successfully pass a drug screen. If you have questions about these restrictions, please contact an Academic Advisor prior to starting the Criminal Justice program.
4. An applicant who has been convicted of any misdemeanor will not be eligible for employment until one year after satisfactory completion of any sentence imposed, including probation.

Michigan Police Academies

A law enforcement career can lead you to be a police officer in almost any geographic area of the country. As a police officer in a rural area, you may perform a wide variety of activities including directing traffic at the scene of a crime, investigating a burglary, or giving first aid to an accident victim. In a larger police department, your duties may be more specific.

Most police academies in Michigan are operated by community colleges. Some of the larger departments in the state, such as the Wayne County Sheriff's Office or Detroit Police Department also operate their own academies.

For a comprehensive list of Michigan Police Academies, visit: http://policelink.monster.com/content/become-a-cop-in-michigan-police-academy-directory.

Culinary Management

Associate in Applied Science Degree *Program Code 312*

Advisor: Chris Woodruff, (269) 927-8868, woodruff@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Mathematics 122, Intermediate Algebra, or
Mathematics 123, Quantitative Reasoning 4
Humanities/Fine Arts 3
Natural Sciences 4

Major Requirements

Business 101, Business Accounting I or
*Business 201, Principles of Accounting I (4 Credits) 3
Hospitality 110, Sanitation 1
Hospitality 111, Responsible Beverage Service 1
Hospitality 120, Professional Cooking I 2
Hospitality 130, Table Service 3
Hospitality 150, Introduction to the Hospitality Industry 3
Hospitality 153, Nutrition 3
Hospitality 200, Internship 3
Hospitality 201, Restaurant Operations 3
Hospitality 220, Professional Cooking II 2
Hospitality 251, Marketing of Hospitality Services 3
Hospitality 252, Supervisory Skills & Human Relations 3
Hospitality 254, Hospitality Cost Control Systems 3
Hospitality 275, Beverage Management 3
Hospitality 280, Garde Manger 2
Hospitality 285, Fundamentals of Baking 2

*Transferring students are encouraged to take BUSA 201

About the Area of Study

Graduates of the Culinary Management Program may select a variety of management and staff related careers in restaurants, hotels, resorts, catering and events, personal food service and artisan food production.

Careers include sous chef, catering chef, pastry chef, personal chef, executive chef, and restaurant owner/operator. In all of these positions, strong guest service, leadership, human resources, problem solving, and math skills are required.

Degree Options

By completing the 60-credit program in Culinary Management, you may apply for an Associate in Applied Science degree.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Sample Program Sequences

An advisor will help you make necessary changes to this recommended sequence.

Semester 1	**Semester 2**
HOSP 150	ENGL 101
HOSP 110	HOSP 130
COMM 101	HOSP 201
HOSP 120	HOSP 220
HOSP 153	MATH 122 or
HOSP 111	MATH 123
	Humanities

Semester 3	**Semester 4**
BUSA 101	POSC 101 or POSC 102 or
BUSA 201	HIST 201 or HIST 202
HOSP 251	HOSP 200
HOSP 275	HOSP 254
HOSP 285	HOSP 280
	Natural Sciences

Dental Assisting (Registered)

Certificate of Achievement – Dental Assisting *Program Code 231*

Associate in Applied Science Degree *Program Code 230*

Advisors: Julie Centala Uribe, (269) 927-8197, juribe@lakemichigancollege.edu
Maryann McCarthy, (269) 695-2947, mmccarthy@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
English 103, Technical Writing, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Mathematics 122, Intermediate Algebra, or
Mathematics 123, Quantitative Reasoning.....4
Biology 110, Biological Science or Biology 205, Human Anatomy 4
Humanities/Fine Arts 3

Major Requirements

**Dental Assisting 165, Introduction to Dental Assisting 3
**Dental Assisting 166, Chairside I.....3
**Dental Assisting 167, Chairside II 3
**Dental Assisting 168, Chairside III 3
**Dental Assisting 169, Chairside V.....3
**Dental Assisting 170, Introduction to Dental Office Assisting 2
+**Dental Assisting 171, Introduction to Dental Radiography.....3
**Dental Assisting 172, Medical Issues in Dental Office.....2
**Dental Assisting 173, Clinical I.....6
**Dental Assisting 174, RDA I 3
**Dental Assisting 175, RDA II 3
**Dental Assisting 176, Clinical II 5
+**Dental Assisting 180, Dental Radiography.....3
Psychology 201, Introduction to Psychology.....3

** Classes required for Certificate program
+ Courses are open to all employed Dental Assistants

Program Accreditation

The program in Dental Assisting is accredited by the Commission on Dental Accreditation of the American Dental Association, a specialized accrediting body recognized by the Council on Postsecondary Accreditation and by the U.S. Department of Education. The program is also accredited by the Michigan State Board of Dentistry.

Sample Course Sequences

Certificate (Full-Time)

Semester 1	Semester 2	Semester 3
*DENT 165	DENT 169	DENT 173
DENT 166	DENT 170	DENT 174
DENT 167	DENT 171	DENT 175
DENT 168	DENT 180	DENT 176
	DENT 172	

Certificate (Part-Time)

Semester 1	Semester 2	Semester 3
*DENT 165	DENT 167	DENT 169
DENT 166	DENT 168	DENT 170
Semester 4	**Semester 5**	**Semester 6**
DENT 171	DENT 174	DENT 173
DENT 180	DENT 175	DENT 176
DENT 172		

Associate Degree (Full-Time)

Semester 1	Semester 2	Semester 3
BIOL 110 or 205	DENT 167	COMM 101
*DENT 165	DENT 168	DENT 170
DENT 166	ENGL 102 or 103	DENT 171
ENGL 101	or COMM 101	DENT 180
Humanities/	DENT 169	POSC 101 or
Fine Arts Elective		POSC 102 or
		HIST 201 or
		HIST 202
Semester 4	**Semester 5**	
DENT 172	DENT 173	
DENT 174	DENT 176	
DENT 175	MATH 122 or 123	
PSYC 201		

Associate Degree (Part-Time)

Semester 1	Semester 2	Semester 3
*DENT 165	DENT 166	DENT 167
BIOL 110 or 205	ENGL 101	ENGL 102 or ENGL 103 or COMM 101
Semester 4	**Semester 5**	**Semester 6**
DENT 168	DENT 169	DENT 170
Humanities/ Fine Arts	POSC 101 or POSC 202 or HIST 201 or HIST 202	MATH 122 or 123
Semester 7	**Semester 8**	**Semester 9**
DENT 171	DENT 172	DENT 174
DENT 180	Humanities/ Fine Arts Elective	
PSYC 201		
Semester 10	**Semester 11**	
DENT 173	DENT 176	
DENT 175		

*Transitional courses can be taken concurrently

Diagnostic Medical Sonography

Associate in Applied Science Degree *Program Code 225*

Advisors: Elizabeth Zak, (269) 927-8870, bzak@lakemichigancollege.edu
Student Services Academic Advising Appointment, (269) 927-8128

Degree Requirements ..... Credit Hours

Program Prerequisites
This program has special admission procedures based on a program-specific GPA ranking and limited enrollment. A certain number of seats will be reserved for certified medical imaging professionals. See the specific admission requirements for Health Science students. Contact Student Services Academic Advising at ext. 8128 or the Health Science office at 269-927-8768 for complete details. An academic advisor will help you determine prerequisites that are required and designed to prepare you for training in the program.

General Education Requirements
English 101, English Composition 3
English 102, English Composition 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Mathematics 122, Intermediate Algebra, or
Mathematics 123, Quantitative Reasoning 4
Biology 110, Human Anatomy & Physiology 4
Humanities/Fine Arts 3

Major Requirements
Diagnostic Medical Sonography 100,
Introduction to Diagnostic Medical Sonography 3
Diagnostic Medical Sonography 101, General Sonography I Abdomen 4
Diagnostic Medical Sonography 102, General Sonography I OB/GYN 4
Diagnostic Medical Sonography 103, Sonography Lab Applications I 3
Diagnostic Medical Sonography 104, Clinical Experience A 2
Diagnostic Medical Sonography 200, General Sonography II Abdomen 3
Diagnostic Medical Sonography 201, General Sonography II OB/GYN 3
Diagnostic Medical Sonography 202, Sonography Lab Applications II 3
Diagnostic Medical Sonography 203, Sonographic Physics I 3
Diagnostic Medical Sonography 204, Clinical Experience B 2
Diagnostic Medical Sonography 213, Sonographic Physics II 3
Diagnostic Medical Sonography 214, Clinical Experience C 5
Diagnostic Medical Sonography 224, Clinical Experience D 5
Diagnostic Medical Sonography 230, Introduction to Vascular
Sonography & Lab Applications 4
Diagnostic Medical Sonography 234, Clinical Experience E 3
Diagnostic Medical Sonography 240, Sonographic Registry Review 2
Physical Science 101, Physical Science: Chemistry and Physics 4
Psychology 201, Introduction to Psychology 3
Reading 110, Medical Terminology Vocabulary or
Health 103, Medical Terminology 1

Program Accreditation
Accredited by the Joint Review Committee on Education in Diagnostic Medical Sonography, located at 6021 University Boulevard, suite 500, Ellicott City, MD 21043; Phone 443-973-3251; jrcdms.org.

The program is also accredited by the Commission on Accreditation of Allied Health Education Programs, located at 1361 Park Street, Clearwater, FL 33756; Phone 727-210-2350; caahep.org.

Diagnostic Medical Sonography Program Handbook

In addition to the rules stated in this catalog, Ultrasound students are required to abide by the rules stated in the Diagnostic Medical Sonography Program Handbook.

About the Area of Study

The Diagnostic Medical Sonography program trains you to become a diagnostic medical sonographer. This 18-month program includes one spring semester and two summer terms of course work. You will obtain clinical experience at local healthcare facilities in addition to formal classroom instruction provided on campus.

Diagnostic medical sonographers are employed in hospitals, clinics, commercial x-ray laboratories and physician offices where they use sophisticated imaging equipment that is dependent upon sound wave technology. In addition to preparing patients and operating equipment, diagnostic medical sonographers also work with radiologists, referring physicians and hospital management to assure quality patient care and diagnosis.

Diagnostic medical sonographers also serve in capacities such as departmental managers, technical advisors and applications specialists, sales and service for ultrasound equipment manufacturers, and as educators.

Associate's Degree

Upon completion of the 80-credit Diagnostic Medical Sonography program, graduates may apply for an Associate in Applied Science degree.

Certification Examination

Qualified graduates are eligible to sit for the ARDMS or ARRT ultrasound credentialing exam.

Sample Course Sequence

An advisor will help you make necessary changes to this recommended sequence.

Associate Degree Program

Semester 1	Semester 2	Semester 3
DMSO 100	DMSO 101	DMSO 200
PHED 200	DMSO 102	DMSO 201
ENGL 102	DMSO 103	DMSO 202
POSC 101 or 102 or HIST 201 or 202	DMSO 104	DMSO 203
		DMSO 204
Semester 4	**Semester 5**	**Semester 6**
DMSO 214	DMSO 224	DMSO 213
		DMSO 230
		DMSO 234
		DMSO 240

Elementary Education

Associate in Arts Degree – TRANSFER PROGRAM *Program Code 037*

Advisors: Erika Milovich, (269) 927-6739, emilovich@lakemichigancollege.edu
Student Services Academic Advising, (269) 927-8128

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 3
Mathematics 3
*Natural Sciences.....8
Social Sciences.....3
Humanities/Fine Arts.....6

Major Requirements

Requires at least one course in EDUC.....3
General Electives.....25

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

Colleges of Education:

Andrews University .....www.andrews.edu/sed
Central Michigan University..... www.ehs.cmich.edu
Eastern Michigan University ..... www.emich.edu/coe
Ferris State University..... www.ferris.edu
Grand Valley State University.....www.gvsu.edu/soe
Indiana University South Bend ..... www.iusb.edu/~edud
Michigan State University .....www.educ.msu.edu
Northern Michigan University ..... www.nmu.edu/education
University of Michigan ..... www.soe.umich.edu
Western Michigan University .....www.wmich.edu
Western Michigan University-Southwest ....https://wmich.edu/southwest

If you are interested in attending a school not listed here, please work with an academic advisor to build a program that will meet the requirements of your chosen school.

About the Area of Study

Education is a rigorous curriculum that leads to a rewarding career. LMC's Elementary Education - Transfer Associate of Arts program prepares students transferring to a 4-year institution's teacher preparation bachelor's program. The program curriculum includes general education and subject area courses, professional preparation, and field experience. This program provides students with a solid understanding of the field of education and working with diverse populations.

Transfer Resources

Students wishing to pursue a career in elementary education will need to continue their education at a 4-year institution. The curriculum for students preparing to become elementary teachers varies considerably among transfer institutions. If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

LMC has developed several articulation agreements/partnerships with colleges and universities in Teacher Education. These agreements are designed to facilitate the transfer of credits from LMC to these Colleges of Education. **Students must meet with an academic advisor before their first semester for the specific requirements of the college or university they are planning to attend.**

In discussions with their advisor, students will determine the teaching certification/grade level they are interested in pursuing, their college selection, and an academic content major or minor area for additional endorsements. With several course options in this program, it is important that students choose courses based on their career and transfer goals.

Professional Readiness Exam (PRE)

The state of Michigan requires a teacher candidate to pass all 3 sections of the Professional Readiness Exam (PRE) before they can begin their education coursework at a 4-year institution. It is recommended that you take the examination after you have prepared for it. The PRE measures proficiency in reading, writing and math. There are circumstances when a teacher candidate is not required to take the PRE. Please see your Education advisor for additional information.

Elementary Education

Associate in Applied Science in Elementary Education (K-8th Grade Certification) WMU-Main *Program Code EEDW*

Advisors: Erika Milovich, (269) 927-6739, emilovich@lakemichigancollege.edu
Student Services Academic Advising, (269) 927-8128

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition 3
Political Science 101, National Government.....3
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 3

Major Requirements

Art 111, Art Education, or Music 200, Music for the Elementary Teacher....3
Biology 170, Life Science for Elementary Teachers I 3
History 201, American History.....3
History 202, American History.....3
History 204, Modern East Asia.....3
Humanities 201, Introduction to the Arts.....3
Mathematics 200, Math for Elementary Teachers.....4
Mathematics 210, Geometry for Elementary Teachers 4
Mathematics 265,
Probability and Statistics for Elementary/Middle School Teachers.....4
Physical Science 180, Physical Science for Elementary Teachers I.....3
Physical Science 190, Earth Science for Elementary Teachers I 3
Physical Science 280, Physical Science for Elementary Teachers II.....3
Physical Science 290, Earth Science for Elementary Teachers II 3
Psychology 201, Introduction to Psychology.....3
Psychology 203, Human Development, or
Psychology 204, Child Development and Personality 3
Select one 3 to 4 Credit Course in Content Area Major or Minor Area (Below)

As transfer students into WMU's Elementary Education program, LMC students will select one 3-4 credit course from the list below that will apply toward their required content area major or minors.

CONTENT AREA MAJOR/MINORS:

Science Major or Minor
Select **ONE** course:

CHEM 101, Intro. Chemistry I, OR
PHYS 104, Introduction to Sky and Solar System, OR
BIOL 270, Life Science for Elementary Teachers II

Language Arts Major or Minor
Select **ONE** course:

ENGL 208, Literary Interpretation, OR
ENGL 214, Children's Literature, OR
ENGL 215, Poetry, OR
ENGL 216, Literature of Black America

Social Studies Major
POSC 102, State Governments

About the Area of Study

Education is a rigorous curriculum that leads to a rewarding career. Education majors at Lake Michigan College build the strong academic background needed for success in obtaining their Associate in Applied Science in Elementary Education for transfer to Western Michigan University's teacher preparation bachelor degree program. The Elementary Education transfer program includes general education and subject area courses, professional preparation, and field experience while introducing students to the field of education and diverse learners.

Transfer Resources

This program meets transfer requirements specific to WMU's main campus in Kalamazoo, Michigan. With successful completion of the Bachelor of Science degree in Elementary Education at WMU, students meet state requirements for a Michigan Provisional Elementary Teacher's Certificate (K-8th grades) with one content area major (math, science, language arts, or social studies) or two content area minors (math, science, or language arts). Students must meet with an LMC Academic Advisor to develop their plan of study before their first semester.

Those students interested in transferring to other universities should refer to the Lake Michigan College program description for Elementary Education Associate in Arts Degree – Transfer Program, and then become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Admission Requirement to WMU

Elementary Education Program
To be admitted to the Elementary Education program at WMU's main campus, students must meet the following criteria:

- Completion of 35 credits
- Achievement of a cumulative grade point average of a 3.0 or better
- Achievement of passing scores on the Michigan Test for Teacher Certification-*Professional Readiness Exam (PRE)*-or considered to have passed via alternative pass measures
- Completion of all WMU intellectual skills development requirements if required
- Completion of LMC's ENGL 101 and 102 with a "CB" or better
- Completion of LMC's PSYC 203 or 204 with a "CB" or better (*You must take PSYC 201 first)*
- Completion and submission of a formal application and background check to WMU's College of Education

Energy Production/HPRP

Associate in Applied Science Degree *Program Code HPRP*

Advisor: Steve Karsten, (269) 927-1000 ext. 3080, skarsten@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
English 103, Technical Writing, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Mathematics 122, Intermediate Algebra, or
Mathematics 123, Quantitative Reasoning 4
Physics 110, Technical Physics 4
Humanities/Fine Arts 3

Major Requirements

Chemistry 101, Introductory Chemistry I 4
Energy Production Technology 100,
Energy Industry Fundamental Concepts 3
Energy Production Technology 200, Power Plant Materials 3
*Energy Production Technology 205, Energy/Power Field Experience 2
Energy Production Technology 210, Radiation Detection and Protection 3
Energy Production Technology 223, Radiation Monitoring 3
Energy Production Technology 225, Reactor Theory, Safety and Design 3
Energy Production Technology 230, Thermo Fluid Science 3
Energy Production Technology 233, Dosimetry 3
Energy Production Technology 235, Power Plant Components 3
Energy Production Technology 243, Radiation Materials and Control 3
Energy Production Technology 249, Safety Response 3
Energy Production Technology 253, Radiation Protection Capstone 3
Mathematics 128, Pre-Calculus Algebra 4
Trade Related Instruction 138, Industrial Safety 1

Program Electives (Suggested but not required)

Energy Production Technology 111,
Intro to Energy Production Distribution 3
Energy Production Technology 116,
Chemistry and Radiation Protection Fundamentals 3
Energy Production Technology 120, Energy Plant Drawings 3

*All field experience must be scheduled through an advisor.

About the Area of Study

A solid knowledge of science and math, strong communication skills, the ability to problem solve, and attention to detail are critical to being successful in the energy production field.

After completion of the associate's degree program at LMC, those who enter the field should expect a career that will involve on-going, extensive on-the-job training. In fact, local nuclear plants can often invest up to $2 million per employee in training during an entire career.

Associate's Degree

When you complete the 64-credit Energy Production Technology program, you may apply for an Associate in Applied Science degree.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Sample Course Sequence

An advisor will help you develop course program sequences.

Energy Production Line Worker

Certificate of Achievement *Program Code 368*

Advisor: Steve Karsten, (269) 927-1000 ext. 3080, skarsten@lakemichigancollege.edu

Degree Requirements .....Credit Hours

Major Requirements

Trade Related Instruction 138, Industrial Safety.....1
Energy Production Technology 111, Energy Generation & Distribution.....3
Trade Related Instruction 144, Blueprint Reading & Sketching 4
Electronics Technology 100, DC Electricity.....4
Electronics Technology 106, AC Electricity 3
Electronics Technology 151, Transformers, Motors & Motor Controls 4
Trade Related 156, Industrial Rigging 2
Energy Production Technology 185, Line Worker Orientation.....1
Energy Production Technology 188, Line Worker Field Experience.....2
Energy Production Technology 190, Introduction to the Utility Industry.....3
Energy Production Technology 191,
Climbing & Working in Elevated Work Sites.....3
Energy Production Technology 192, Utility Construction Fundamentals.....3
Energy Production Technology 193, Energy Production Technology.....3

About the Area of Study

The primary goal of the Line Worker certificate program is to prepare the student for employment as an entry-level utility worker. This two-semester program has been developed to meet the utility industry's need for trained, entry-level employees. The College's certificate program is designed to prepare individuals to install and repair business and residential electrical, telephone, and telegraph transmission systems. Students complete 36 credit hours of practical theory and hands-on training using actual equipment and materials in classroom, laboratory, and field settings.

Certificate Options

When you complete the 36 credit Line Worker certificate program, you may continue on an Associate in Applied Science degree in General Technology. See the General Technology degree page for details.

Energy Production Technology

Associate in Applied Science Degree *Program Code EPTE*

Advisor: Steve Karsten, (269) 927-1000 ext. 3080, skarsten@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
English 103, Technical Writing, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Mathematics 122, Intermediate Algebra, or
Mathematics 123, Quantitative Reasoning.....4
Physics 110, Technical Physics 4
Humanities/Fine Arts 3

Major Requirements

Electronics Technology 100, DC Electricity 4
Electronics Technology 106, AC Electricity 3
Electronics Technology 151, Transformers and Motor Controls 4
Energy Production Technology 111,
Intro to Energy Production Distribution.....3
Energy Production Technology 116, Chemistry and Radiation
Protection Fundamentals 3
Energy Production Technology 200, Power Plant Materials 3
*Energy Production Technology 205, Energy/Power Field Experience 2
Energy Production Technology 225,
Reactor Theory, Safety and Design, or
Energy Production Technology 182,
Boiler Theory, Safety, and Design Systems 3
Energy Production Technology 230, Thermo Fluid Science 3
Energy Production Technology 235, Power Plant Components 3
Energy Production Technology 250,
General Maintenance Systems & Components 3
Industrial Maintenance Technology 204, Basic Hydraulics & Pneumatics 2
Industrial Maintenance Technology 240,
Predictive and Preventive Maintenance 3
Mathematics 128, Pre-Calculus Algebra, or
Mathematics 130, Pre-Calculus Trigonometry 3
Trade Related Instruction 138, Industrial Safety.....1

*All field experience must be scheduled through an advisor.

About the Area of Study

A solid knowledge of science and math, strong communication skills, the ability to problem solve, and attention to detail are critical to being successful in the energy production field.

After completion of the associate's degree program at LMC, those who enter the field should expect a career that will involve ongoing, extensive on-the-job training. In fact, local nuclear plants can often invest up to $2 million per employee in training during an entire career.

Associate's Degree

When you complete the 63-credit Energy Production Technology program, you may apply for an Associate in Applied Science degree.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Sample Course Sequence

An advisor will help you develop course program sequences.

Energy Production and Distribution

Bachelors of Applied Science Degree *Program Code EPDM*

Advisor: Joe Zwiller, (269) 927-1000 ext. 5003, zwiller@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
English 103, Technical Writing 3
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Mathematics 122, Intermediate Algebra 4
Mathematics 128, Pre-Calculus Algebra, or
Mathematics 130, Pre-Calculus Trigonometry, or
Mathematics 135, Pre-Calculus Algebra/Trigonometry 4
Business 216, Business Statistics, or
Mathematics 216, Introduction to Statistics 3
Physics 110, Technical Physics 4
Humanities/Fine Arts 3

Major Requirements

Business Administration 200, Introduction to Economics 3
Business Administration 211, Principles of Management 3
Business Administration 220, Organizational Behavior 3
Energy Prod & Dist Mgmt 300, Energy Production to Consumption 3
Energy Prod & Dist Mgmt 301, Finance and Accounting Foundations 4
Energy Prod & Dist Mgmt 310, Integrated Communications in Business 3
Energy Prod & Dist Mgmt 315, Human Performance 3
Energy Prod & Dist Mgmt 320, Human Resource Management 3
Energy Prod & Dist Mgmt 325, Leadership in Industrial Settings 3
Energy Prod & Dist Mgmt 350, Energy Economics 3
Energy Prod & Dist Mgmt 375, Applied Ethics in Business 3
Energy Prod & Dist Mgmt 400, Law and Regulatory Issues in Energy 3
Energy Prod & Dist Mgmt 435,
Employee Training – A Systematic Approach 3
Energy Prod & Dist Mgmt 450, Mgmt for Quality Assurance & Control 3
Energy Prod & Dist Mgmt 475, Project Management 3
Energy Prod & Dist Mgmt 495, Capstone in Energy Prod & Dist Mgmt 3

Program Electives (Select 40-42 Credit Hours)

Please see the program advisor before selecting program electives.

Note: A minimum of 120 credits must be completed to earn the Bachelor of Applied Science degree.

About the Area of Study

The Bachelor of Applied Science in Energy Production and Distribution is a completion degree that builds on the technical expertise and experience of students who successfully complete the Associate of Applied Science in Energy Production or a related program offered by Lake Michigan College or equivalent programs from other institutions.

Upper level coursework focuses on business practices, operations management methods, and skills that can be applied in an array of occupations within the energy industry. With appropriate industry experience, graduates of the Bachelor of Applied Science in Energy Production and Distribution Management program can expect to compete for energy industry positions such as power plant operator, shift leader, project manager, maintenance supervisor, production manager, and team leader.

Degree Options

By completing the 120-122-credit program in Energy Production and Distribution Management, you may apply for a Bachelor of Applied Science degree.

Engineering

Associate in Science Degree – TRANSFER PROGRAM *Program Code 082*

Advisor: John Stahl, (269) 927-8184, jstahl@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
**Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
Mathematics 151, Calculus I 5
Physics 201, Engineering Physics I 5
*Natural Sciences 4
*Social Sciences 3
*Humanities/Fine Arts 6

Major Requirements

Mathematics 201, Calculus II 5
Mathematics 202, Calculus III 5
Mathematics 252, Differential Equations 4
Physics 202, Engineering Physics II 5
General Electives 8

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

This program is designed to cover most of the freshman and sophomore pre-engineering requirements in a typical Bachelor engineering program. The curriculum is intensively mathematical and has challenging performance requirements. The level of rigor will lay the foundation in analytical reasoning and problem solving required to succeed in an engineering discipline. There is a 60-credit degree requirement needed for graduation.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Engineering Technology

Associate in Applied Science Degree *Program Code ENTC*

Advisor: Kevin Kreitner, (269) 927-3033, kkreitner@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 103, Technical Writing.....3
Political Science 101, National Government.....3
Mathematics 123, Quantitative Reasoning 4
Chemistry 101, Introductory Chemistry I, or
Chemistry 104, Fundamentals of General, Organic, or Biochemistry ..4
Humanities/Fine Arts 3

Major Requirements

Chemistry 111, General Chemistry 4
Electricity 100, DC Electricity 4
Electricity 106, AC Electricity 3
Engineering 113, Beg. Engr. Graphics 4
Engineering 210, Advanced CAD Tech. 3
Industrial Maintenance Technology 204, Basic Hydraulics & Pneumatics 2
Machine Tool Technology 110, Machine Tool I 3
Machine Tool Technology 120, Machine Tool II.....3
Machine Tool Technology 140, Intro to CNC.....2
Machine Tool Technology 150, Intro to CAM.....2
Manufacturing Technology 120, Introduction to PLC.....2
Manufacturing Technology 122, Intro to Robotics 2
Manufacturing Technology 222, Industrial Robotics 4
Manufacturing Technology 224, Robotics IR Systems 2
Mathematics 135, Pre-Calculus.....5
Physics 101, General Physics I 5

About the Area of Study

The Engineering Technology program concentrates on product design principles, materials, and manufacturing processes. The primary program objective is to prepare students to assist and support engineers with projects and research and development. Students will be trained in skills and techniques related to branches of engineering, with practical understanding of general engineering concepts.

Associate's Degree

When you complete the 70-credit Engineering Technology program, you may apply for an Associate in Applied Science degree.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Sample Course Sequence

An advisor will help you develop course program sequences.

English

Associate in Arts Degree – TRANSFER PROGRAM *Program Code 041*

Advisors: Nick Brittin, (269) 927-8759, brittin@lakemichigancollege.edu
Joseph Eklund, (269) 927-8195, eklund@lakemichigancollege.edu
Chuck Jordan, (269) 927-8966, jordanc@lakemichigancollege.edu
Sean Newmiller, (269) 927-8741, snewmiller@lakemichigancollege.edu
Dr. Sarah Smith, (269) 927-8872, ssmith@lakemichigancollege.edu
Dr. Janice Zerfas, (269) 927-8871, zerfas@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
**Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
Mathematics 3
*Natural Sciences.....8
*Social Sciences.....3
*Humanities/Fine Arts.....6

Major Requirements

Required at least one course in ENGL
(Cannot use ENGL 101, 102, or 103) 3
General Electives.....27

The following English courses are offered at LMC:

English 101, English Composition 3
English 102, English Composition 3
English 103, Technical Writing.....3
English 201, Gender Studies 3
English 203, Masterpieces of English Literature I 3
English 204, Masterpieces of British Literature II 3
English 205, Introduction to Shakespeare.....3
English 206, Modern Drama 3
English 208, Literary Interpretation 3
English 209, American Novel.....3
English 210, American Literature to 1865 3
English 211, American Literature 1865 to Present.....3
English 214, Children's Literature 3
English 215, Poetry.....3
English 216, Literature of Black America.....3
English 217, Creative Writing 3

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

Students pursuing a bachelor's degree in English will be able to complete their first two years of college with courses at Lake Michigan College. All courses in English and other recommended courses are transferable to other institutions in Michigan and elsewhere.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Foreign Language

Associate in Arts Degree – TRANSFER PROGRAM *Program Code 042*

Advisor: Nick Brittin, (269) 927-8759, brittin@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
**Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
Mathematics 3
*Natural Sciences.....8
*Social Sciences.....3
*Humanities/Fine Arts.....6

Major Requirements

Requires at least one course in Foreign Language.....3
General Electives.....27

The following Foreign Language courses are offered at LMC:

Foreign Language 101, Elementary French I 4
Foreign Language 102, Elementary French II 4
Foreign Language 121, Elementary Spanish I.....4
Foreign Language 122, Elementary Spanish II 4
Foreign Language 123, Spanish for the Workplace I.....4
Foreign Language 124, Spanish for the Workplace II.....4
Foreign Language 181, Elementary Russian I 4
Foreign Language 182 Elementary Russian II.....4
Foreign Language 188, Elementary Japanese I.....4
Foreign Language 189, Elementary Japanese II.....4
Foreign Language 195, Elementary Italian I.....4
Foreign Language 196, Elementary Italian II.....4
Foreign Language 221, Intermediate Spanish I 4
Foreign Language 222, Intermediate Spanish II 4
Foreign Language 251 Advanced Oral and Written Spanish 3

*From at least two academic disciplines.
*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

This program will help you succeed if you plan to use a foreign language as a primary skill in teaching, interpreting, translating, or business. The courses broaden your background knowledge and awareness of the world and its interdependent people. You are strongly urged to gain a good understanding of the cultural heritage of the foreign language you study.

Wider employment opportunities are available if you combine knowledge of a foreign language with professional programs like business administration, journalism, travel, tourism, hospitality and education. Courses in French and Spanish are offered in regular classroom instruction format. Courses in Arabic, Mandarin Chinese, Italian, Japanese, Polish and Russian are offered in the Self-Instructional Language program format.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

General

Associate in Applied Science General *Program Code AASG*

Advisor: Dr. Ken Flowers, (269) 927-4103, flowers@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
English 103, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Natural Sciences 3
Mathematics 3
Humanities/ Fine Arts 3

Electives

General Electives 42

These are generally courses taken in the Career and Workforce Education or Health Sciences area. Please work with an academic advisor for assistance.

About the Area of Study

The Associate in Applied Science General degree is an appropriate degree for students who have taken or plan to take applied courses in diverse areas of the college without designating a major area of study. Please work with an academic advisor as you plan your program.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

General Studies

Associate in General Studies – TRANSFER PROGRAM *Program Code 005*

Advisor: Dr. Gary C. Roberts, (269) 927-8771, roberts@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
English 103, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Natural Sciences 3
Mathematics 3
Humanities/Fine Arts 3

Electives

General Electives 42

About the Area of Study

The Associate in General Studies degree is an appropriate degree for students who have taken or plan to take courses in diverse areas of the college without designating a major area of study. The Associate in General Studies meets all general education requirements at Lake Michigan College. Please work with an academic advisor as you plan your program.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Sample Program:

The suggested program for the Associate in General Studies degree; because this degree is extremely flexible, it is essential that you work with an advisor to develop an individualized program that meets your specific needs.

General Technology

Associate in Applied Science Degree *Program Code GENT*

Advisor: Kevin Kreitner, (269) 927-1000 ext. 3033, kkreitner@lakemichigancollege.edu

---

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition.....3
English 102, English Composition, or
English 103, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Math 100, Applied Mathematics, or
Math 122, Intermediate Algebra, or
Math 123, Quantitative Reasoning.....4
Physics 110, Technical Physics 4
Humanities/Fine Arts.....3

Major Requirements

Mathematics 110, Technical Mathematics I, or
Mathematics 130, Pre-Calculus Trigonometry, or
Mathematics 135, Pre-Calculus Algebra/Trig.....3
Business 103, Introduction to Business.....3

At least 34 hours of credit from the industrial technology and business areas are required. These courses should be part of a planned program of study as designed by the advisor to meet your interests and your employer's needs.

About the Area of Study

With a two-year degree focused in your general technology area of study, you could be prepared for entry-level positions including assistant manager, basic electrical, CNC machinist, business, maintenance, and welding.

Associate's Degree

When you complete the 60-credit General Technology program, you may apply for an Associate in Applied Science degree.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Sample Course Sequence

An advisor will help you develop course program sequences.

Graphic Design

Level 1 Certificate *Program Code 394*

Advisor: Brandon Pierce, (269) 927-8767, pierce@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

Certificate Requirements

Art 109, Basic Design I, 2D.....3
Art 122, Drawing I.....3
Art 123, Drawing II 3
Graphic Design 101, Digital Studio I 3
Graphic Design 130, Photography I.....3
Graphic Design 131, Photography II 3
Graphic Design 200, Principles of Typography 3
Graphic Design 220, Digital Studio II 3

About the Area of Study

Graphic design is the intermingling of traditional art and design elements with leading edge computer technology. The Graphic Design program will prepare you for local employers and to serve as a freelance graphic designer. Graphic designers often work for marketing, public relations, and advertising firms; commercial printing; newspapers; and other publishing organizations.

Mac-based instruction using tools such as Adobe Creative Cloud and other industry-standard image editing, page layout, and vector-based illustration software is featured in the program.

Certificate Options

Upon completion of the 24-credit program you may apply for a Level 1 Certificate. The certificate coursework can be applied to the Associate in Arts degree transfer program.

Graphic Design

Associate in Arts Degree *Program Code 395*

Advisor: Brandon Pierce, (269) 927-8767, pierce@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History or
History 202, American History 3
**Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
Mathematics 3
*Natural Sciences 8
*Social Sciences 3
*Humanities/Fine Arts 6

Major Requirements

Requires at least one course in GRDN 3
General Electives 27

The following GRDN classes are offered at LMC:

Graphic Design 101, Digital Studio I 3
Graphic Design 110, Introduction to Graphic Design 3
Graphic Design 130, Photography I 3
Graphic Design 131, Photography II 3
Graphic Design 140, Production Skills for Graphic Design 3
Graphic Design 200, Principles of Typography 3
Graphic Design 201, Typography II 3
Graphic Design 220, Digital Studio II 3

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

Graphic design is the intermingling of traditional art and design elements with leading edge computer technology. The Graphic Design program will prepare you for local employers and to serve as a freelance graphic designer. Graphic designers often work for marketing, public relations, and advertising firms; commercial printing; newspapers; and other publishing organizations.

Mac-based instruction using tools such as Adobe Creative Cloud and other industry-standard image editing, page layout, and vector-based illustration software is featured in the program.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Program Sequence

Students are strongly encouraged to take the following studio classes in their first year:

ART 109 Basic Design 1, 2D (fall)
ART 110 Basic Design 2, 3D (spring)
ART 122 Drawing 1 (fall, ideally)
ART 123 Drawing 2 (spring, ideally)
GDRN 101 Digital Studio 1 (fall or spring)

Health

Associate in Science Degree – TRANSFER PROGRAM *Program Code 053*

Advisor: Dan Meyer, (269) 927-8745, meyer@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
**Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
Psychology 201, Introduction to Psychology 3
Mathematics 3
*Natural Sciences 8
*Humanities/Fine Arts 6

Major Requirements

Biology 205, Human Anatomy 4
Physical Education and Wellness 145, Total Fitness I 1
Sociology 101, Principles of Sociology 3
Requires at least one additional course in MATH 4
General Electives 22

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

The courses offered in Health are for those students interested in personal and community health. Students have the opportunity to become certified in life-saving techniques or first-aid procedures, investigate various health career options, or evaluate their own levels of healthful living and develop plans toward more health-filled lifestyles. Consult a faculty advisor for specific guidance. There is a 60-credit degree requirement needed for graduation.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancolleg.edu/transfer**.

History

Associate in Arts Degree – TRANSFER PROGRAM *Program Code 021*

Advisor: Dr. Chris Paine, (269) 927-8607, paine@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
**Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
*Social Sciences 3
Mathematics 3
*Natural Sciences 8
*Humanities/ Fine Arts 6

Major Requirements

Requires at least one additional course in HIST 3
General Electives 27

The following History classes are offered at LMC:

History 101, History of Western Civilization I 4
History 102, History of Western Civilization II 4
History 201, American History 3
History 202, American History 3
History 204, Modern East Asia 3
History 205, African American History 3
History 209, Women in the Western World 3
History 210, The Civil War and Reconstruction 3

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

History is a branch of knowledge that records and explains past events. If you plan to obtain a bachelor's degree in History, you may complete the first two years of your studies at Lake Michigan College. All of the History courses are transferable to other Michigan colleges as well as other four-year colleges and universities.

History majors find employment in areas such as teaching, library/archival fields, and government service. Along with Political Science, a bachelor's degree in History is regarded as a stepping stone to law school. Students are strongly urged to complete two semesters of German, French, or Spanish. Consult a faculty advisor for specific guidance. There is a 61-credit degree requirement needed for graduation.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Honors Curriculum – Transfer Program

Advisor: Dr. Amy Scrima, (269) 927-8777, ascrima@lakemichigancollege.edu

Degree Requirements .....Credit Hours

Sample Transfer Program

Fall Semester, Year I

HONR 241 Honors Colloquium 1
HONR 250 Honors English Composition 3
HONR 121 Honors Intro to Psychology 4
HONR 141 Honors National Government.....3
Elective 3
TOTAL: 14

Spring Semester, Year I

HONR 241 Honors Colloquium 1
HONR 251 Honors English Composition 3
HONR 215 Honors American History 3
HONR 101 Honor Biological Science 4
Elective 3-4
TOTAL: 14-15

Fall Semester, Year II

HONR 241 Honors Colloquium 1
HONR 150 Honors Calculus I.....5
HONR 203 Honors Human Development 3
HONR 175 Honors Introduction to Logic 3
Elective 3-4
TOTAL: 15-16

Spring Semester, Year II

HONR 241 Honors Colloquium 1
HONR 258 Honors Literary Interpretation 3
HONR 130 Honors Principles of Sociology 3
HONR Foreign Language.....3
Elective 3
Elective 3
TOTAL: 16

Admissions Requirements for the Honors Program

High School Graduates or Early College Students

3.5 high school GPA, 25 composite ACT, OR Compass Scores of: Writing 94; Reading 92; Math 66

College Students

3.5 GPA for minimum of 12 hours of college credit, OR Compass Scores of: Writing 94; Reading 92; Math 66

Once admitted, students must take the Honors Colloquium at least once per academic year and the expectation is that students will maintain full time status.

Exceptions at the discretion of the Director of the Honors Program

Transfer Opportunities

Lake Michigan College has a transfer agreement with Lee Honors College at Western Michigan University.

If you are interested in attending a school not listed here, please work with the honors program director and your academic advisor to build a program that will meet the requirements of your chosen school.

About the Area of Study

Honors courses allow students to work closely with their instructors on projects designed to further their academic interests and skills. The honors program offers many additional opportunities to students in the areas of community service, public speaking skills, transfer preparedness, internships, fellowships and scholarship potential.

Transfer Resources

Sample Transfer Program

It is essential that you consult with a counselor or academic advisor for the specific requirements of the college you plan to attend.

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Hospitality Management

Certificate of Achievement – Hospitality Management *Program Code 315*

Associate in Applied Science Degree *Program Code 316*

Advisor: Chris Woodruff, (269) 927-8868, woodruff@lakemichigancollege.edu

---

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
English 103, Technical Writing, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Math 122, Intermediate Algebra, or
Math 123, Quantitative Reasoning 4
Natural Sciences.....4
Humanities/Fine Arts.....3

Major Requirements

Business 101, Business Accounting, or
*Business 201, Principles of Accounting I.....3
Hospitality Management 110, Sanitation.....1
Hospitality Management 111, Responsible Beverage Service 1
Hospitality Management 115, Safety & Legal Overview.....3
Hospitality Management 117, Introduction to Meetings and Events 3
Hospitality Management 130, Table Service 3
Hospitality Management 150, Introduction to Hospitality Careers.....3
Hospitality Management 153, Nutrition.....3
Hospitality Management 200, Hospitality Management Internship.....3
Hospitality Management 201, Restaurant Operations 3
Hospitality Management 250, Food Preparation Skills.....2
Hospitality Management 251, Marketing of Hospitality.....3
Hospitality Management 252, Supervisory Skills & Human Relations 3
Hospitality Management 253, Tourism.....3
Hospitality Management 254, Hospitality Cost Control Systems 3
Hospitality Management 255, Hotel Management & Operations 3
Hospitality Management 275, Beverage Management.....3

Electives (Optional)

Foreign Language 123, Spanish in the Workplace 4
Hospitality Management 202, Introduction to Casino Management.....3

*Transferring students are encouraged to take BUSA 201

About the Area of Study

Graduates of the Hospitality Management program may select from a variety of management and staff-related careers in hotels, restaurants, resorts, clubs, event planning, casinos, and travel and tourism. Some careers include hotel general manager, restaurant general manager, executive housekeeper, guest services manager, food and beverage manager, and convention services manager. In all of these positions, strong guest service, leadership, human resources, problem solving, and revenue management skills are required.

Certificate & Associate Degree

Upon completion of the 40-credit program, you may apply for a Certificate of Achievement. Upon completion of the 66-credit program, you may apply for an Associate in Applied Science degree. Certificate requirements may be applied to the degree program.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Sample Program Sequences

An advisor will help you make necessary changes to these recommended sequences.

Certificate Program

Semester 1	Semester 2
COMM 101	HOSP 111
HOSP 110	HOSP 117
HOSP 115	HOSP 153
HOSP 150	HOSP 200
HOSP 251	HOSP 201
HOSP 252	HOSP 250
HOSP 255	HOSP 254

Associate Degree Program

Semester 1	Semester 2	Semester 3
ENGL 101	ENGL 102 or	HOSP 115
HOSP 150	ENGL 103 or	HOSP 251
HOSP 110	COMM 101	HOSP 252
COMM 101	HOSP 117	HOSP 255
HOSP 111	HOSP 201	HOSP 275
HOSP 153		BUSA 201

Semester 4	
POSC 101 or	HOSP 200
POSC 102 or	HOSP 201
HIST 201 or	HOSP 253
HIST 202	HOSP 254

Humanities

Associate in Arts Degree – TRANSFER PROGRAM *Program Code 024*

Advisors: Dr. Denise Scameheorn, (269) 927-8775, scameheo@lakemichigancollege.edu
Dr. Amy Scrima, (269) 927-8777, ascrima@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
**Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
**Mathematics 3
Social Sciences 3
*Humanities/ Fine Arts 6
*Natural Sciences 8

Major Requirements

Requires at least one course in HUMN 3
General Electives 27

The following Humanities classes are offered at LMC:

Humanities 105, Awareness of the Fine Arts 1
Humanities 201, Introduction to the Arts 3
Humanities 207, Introduction to Story and Media 3
Humanities 208, Interpreting Film and Fiction 3
Humanities 209, Introduction to the Art of Cinema 6
Humanities 210, Arts in the Modern World 3
Humanities 211, Studies in Film Art 3
Humanities 212, Arts and Ideas I 3
Humanities 213, Arts and Ideas II 3
Humanities 221, Portraits of the Artist 3
Humanities 294, Field Experience in the Fine Arts 3

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

Programs in the Humanities refer to interdisciplinary study including, but not limited to, modern and classical languages, linguistics, literature, history, jurisprudence, philosophy, archaeology, comparative religion, ethics, history/criticism/theory of the arts, and aspects of the sciences which have humanistic content and employ humanistic methods. If you want to pursue a bachelor's degree in Humanities, you may complete your first two years of college courses at Lake Michigan College. All Humanities courses are transferable to other institutions in Michigan and elsewhere.

Courses listed under Art, Communication, English, Foreign Languages, History, Humanities, Music, Philosophy, and Theatre with transferable Humanities credits may be taken as electives for a Humanities concentration. Competency in a foreign language is not a degree requirement at Lake Michigan College; however, Humanities majors are urged strongly to complete at least two semesters of French, German, or Spanish. As a Humanities major, you should seek a broad-based education through careful selection of courses under general electives. Consult a faculty advisor for specific guidance. There is a 60-credit degree requirement needed for graduation.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Logistics

Certificate of Achievement *Program Code 379*

Advisor: Joe Zwiller, (269) 927-8100 ext. 5003, jzwiller@lakemichigancollege.edu

Degree Requirements .....Credit Hours

Business 103, Intro to Business.....3
Business 115, Principles of Customer Service.....3
Business 220, Organizational Behavior.....3
Computer Information Systems 100, Intro to Computer Literacy.....3
Logistics 101, Intro to Logistics.....3
Logistics 102, Warehouse and Distribution.....3
Logistics 103, Traffic and Transportation.....3
Logistics 104, Rules and Regulations.....3
Logistics 105, Logistics Technology.....3
Trade Related 138, Industrial Safety.....1
Logistics 205, Logistics Field Experience.....2

About the Area of Study

The primary goal of the Logistics certificate program is to prepare the student for entry-level employment in the logistics field. This two-semester program has been developed to meet the logistic industry's need for trained, entry-level employees. The program is designed to prepare individuals to understand the management of the flow of resources, not only goods, between the point of origin and the point of destination in order to meet the requirements of customers or corporations. Logistics involves the integration of information, transportation, inventory, warehousing, material handling, packaging, and often security.

Certificate Options

When you complete the 30 credit Logistics Certificate of Achievement, you may continue on an Associate in Applied Science degree in General Technology. See the General Technology degree page for details.

Machine Tool Technology

Level 1 Certificate – Machine Tool *Program Code 347*

Level 1 Certificate – Manufacturing Production *Program Code 366*

Advisor: Kevin Kreitner, (269) 927-1000 ext. 3033, kkreitner@lakemichigancollege.edu

Degree Requirements .....Credit Hours

Machine Tool Technology Certificate Requirements

Engineering 103, Beginning Engineering Drawing, or
Engineering 113, Engineering Design & Graphics 4
Machine Tool Technology 110, Machine Tool I 3
Machine Tool Technology 120, Machine Tool II 3
Manufacturing Technology 111, Manufacturing Processes I 3
Mathematics 100, Applied Mathematics, or
Mathematics 122, Intermediate Algebra, or
Mathematics 123, Quantitative Reasoning.....4
Trade Related Instruction 134, Metallurgy and Heat Treatment 3
Trade Related Instruction 144, Blueprint Reading & Sketching 4

Manufacturing Production Certificate Requirements

Machine Tool Technology 110, Machine Tool I 3
Manufacturing Technology 111, Manufacturing Processes I 3
Manufacturing Technology 120, Fundamentals of PLC 2
Trade Related Instruction 138, Industrial Safety.....1
Trade Related Instruction 143, Introduction to Mold Making.....3
Trade Related Instruction 144, Blueprint Reading & Sketching 4

About the Area of Study

The Machine Tool Technology program provides basic and advanced machining skills. Class time is spent in the classroom as well as working in the lab on traditional metal cutting machinery and computer-numerically-controlled (CNC) machines. If you have previous machining experience from a vocational high school program or industrial experience, you may qualify for advanced standing. Career opportunities include CNC operator, CNC programmer, machine builder, machinist, and tool and die maker.

Certificate Options

Upon completion of the listed Machine Tool Technology Certificate Requirements, you will earn a Level 1 Certificate. The certificate allows you to enter the job market with basic, entry-level skills needed to be effective in the workforce. Credit earned can be applied toward your associate's degree.

When you complete the 16-credit Manufacturing Production Technology courses you may apply for the Level 1 Certificate. Credit earned can be applied toward your associate's degree.

Machine Tool Technology

Certificate of Achievement *Program Code 346*

Associate in Applied Science Degree *Program Code MATT*

Advisor: Kevin Kreitner, (269) 927-1000 ext. 3033, kkreitner@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
English 103, Technical Writing, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
*Mathematics 100, Applied Mathematics, or
Mathematics 122, Intermediate Algebra, or
Mathematics 123, Quantitative Reasoning 4
Physics 110, Technical Physics 4
Humanities/Fine Arts 3

Major Requirements

*Engineering 103, Beginning Engineering Drawing, or
Engineering 113, Engineering Design & Graphics 4
Industrial Maintenance Technology 109, Intro to Welding, or
Welding 101, Fabrication I 2
*Industrial Maintenance Technology 110, MIG/TIG Welding 3
*Machine Tool Technology 110, Machine Tool I 3
*Machine Tool Technology 120, Machine Tool II 3
*Machine Tool Technology 130, Precision Inspection 3
*Machine Tool Technology 140, Introduction to Numerical Control (NC)
Computer Numerical Control (CNC) 2
*Machine Tool Technology 150, Introduction to CAM 2
Machine Tool Technology 241, CNC Programming I 2
Machine Tool Technology 242, CNC Programming II 2
Machine Tool Technology 251, 2D/3D/ Machining 2
*Manufacturing Technology 111, Manufacturing Processes I 3
*Mathematics 110, Technical Mathematics I, or
Mathematics 130, Pre-Calculus Trigonometry, or
Mathematics 135, Pre-calculus Algebra/Trig 3
*Trade Related Instruction 134, Metallurgy and Heat Treatment 3
*Trade Related Instruction 144, Blueprint Reading & Sketching 4

Program Electives (Suggested but not required)

Engineering 210, Advanced CAD Techniques 3
Machine Tool Technology 231, CMM Fundamentals 2
Trade Related Instruction 107, Applied Geometry/ Trigonometry 4
Welding 102, Shielded Metal Arc Welding I (SMAW) 2
Welding 103, Gas metal Arc Welding I (GMAW) 2

* Classes required for certificate program.

Some courses may be offered in Open Entry/Open Exit (OE/OE) format. See course description.

About the Area of Study

The Machine Tool Technology program provides basic and advanced machining skills. Class time is spent in the classroom as well as working in the lab on traditional metal cutting machinery and computer-numerically-controlled machines.
If you have previous machining experience from a vocational high school program or industrial experience, you may qualify for advanced standing. Journeymen in the machine field are able to apply previous course work and experience toward an associate's degree. Career opportunities include CNC operator, CNC programmer, machine builder, machinist, and tool and die maker.

Certificate and Degree Options

Upon completion of the Machine Tool Technology certificate program courses, you may apply for the Certificate of Achievement. This allows you to enter the job market with basic, entry-level skills. Credit earned can be applied toward your associate's degree.

When you complete the 61-credit Machine Tool Technology program, you may apply for an Associate in Applied Science degree.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Sample Course Sequence

An advisor will help you develop course program sequences.

Magnetic Resonance Imaging (MRI)

Certificate of Achievement - Magnetic Resonance Imaging *Program Code 242*

Associate in Applied Science Degree *Program Code 240*

Advisors: Marla Clark, (269) 927-8762, mclark@lakemichigancollege.edu
Student Services Academic Advising, (269) 927-8128

Program Prerequisites

This program has special admission procedures based on a program-specific GPA ranking and limited enrollment. A certain number of seats will be reserved for certified medical imaging professionals. See the specific admission requirements for Health Science students. Contact Student Services Academic Advising at ext. 8128 for an academic advising appointment or the Health Science office at ext. 8768 for complete details. An advisor will help you determine prerequisites that are required and designed to prepare you for training in the program.

Degree Requirements .....Credit Hours

General Education Requirements

*English 101, English Composition 3
English 102, English Composition, or
English 103, Technical Writing, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
*Mathematics 122, Intermediate Algebra, or
Mathematics 123, Quantitative Reasoning 4
Biology 101, Biological Science, or
Biology 110, Human Anatomy & Physiology, or
Biology 111, Principles of Biology I, or
Biology 112, Principles of Biology II 4
*Humanities/Fine Arts 3

Major Requirements

*Biology 205, Human Anatomy 4
*Magnetic Resonance Imaging 100, Preclinical Preparation 3
*Magnetic Resonance Imaging 101, Professional Prospectus 1
*Magnetic Resonance Imaging 102,
MRI Procedures and Pathophysiology I 3
*Magnetic Resonance Imaging 103, MRI Physics I 3
*Magnetic Resonance Imaging 105, Clinical Experience I 3
*Magnetic Resonance Imaging 106,
MRI Procedures and Pathophysiology II 3
*Magnetic Resonance Imaging 107, MRI Physics II 3
*Magnetic Resonance Imaging 108, Image Analysis 3
*Magnetic Resonance Imaging 109, Clinical Experience II 3
*Magnetic Resonance Imaging 111, Clinical Experience III 3
*Magnetic Resonance Imaging 113, Registry Review
(Certificate Program Elective) 3
*Magnetic Resonance Imaging 114, Applied Sectional Anatomy 3
*Magnetic Resonance Imaging 115,
Computer Applications in Medical Imaging 3
*Physical Science 101, Physical Science: Chemistry and Physics 4
*Psychology 201, Introduction to Psychology 3
*Reading 110, Medical Terminology Vocabulary, or
Health 103, Medical Terminology 1

Magnetic Resonance Imaging Technology Program Handbook

In addition to the rules stated in this catalog, MRI students are required to abide by the rules stated in the MRI Technology Program Handbook.

*Courses required for Certificate Program

About the Area of Study

The Magnetic Resonance Imaging (MRI) program trains you to become a Magnetic Resonance Imaging (MRI) technologist. You will obtain clinical experience at local health care facilities in addition to formal classroom instruction provided on campus.

MRI technologists are employed in hospitals and imaging centers where they use sophisticated medical imaging equipment based on radiofrequency and magnetic principles. In addition to preparing patients and operating equipment, MRI technologists also work with radiologists, referring physicians, and hospital management to assure quality patient care and diagnosis.

MRI technologists also serve in capacities such as departmental managers, technical advisors and applications specialists, sales and service for MRI manufacturers, and as educators.

Program Accreditation

See program advisor for more details.

Certificate and Degree Options

Medical Imaging professionals completing the 34-credit program in Magnetic Resonance Imaging may apply for a Certificate of Achievement - Magnetic Resonance Imaging. The certificate can be applied to the associate's degree program. Students from a non-imaging background must complete the 69-credit associate degree program for Magnetic Resonance Imaging.

Certification Examination

Qualified graduates are eligible to sit for the ARRT's MRI certification exam. See the program advisor for details.

Sample Course Sequence

Certificate Degree

Semester 1	Semester 2
MRIT 100	MRIT 102
MRIT 101	MRIT 103
MRIT 114	MRIT 105
	MRIT 115

Semester 3	Semester 4
MRIT 106	MRIT 111
MRIT 107	MRIT 113
MRIT 108	
MRIT 109	

Associate Degree

Semester 1	Semester 2
ENGL 102 or	MRIT 102
ENGL 103 or	MRIT 103
COMM 101 or	MRIT 105
MRIT 100	MRIT 115
MRIT 101	
MRIT 114	

Semester 3	Semester 4
MRIT 106	MRIT 111
MRIT 107	MRIT 113
MRIT 108	POSC 101 OR 102 OR
MRIT 109	HIST 201 OR 202

Manufacturing Engineering for WMU

Associate in Applied Science Degree *Program Code 265*

Advisor: John Stahl, **(269) 927-8184**, jstahl@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 103, Technical Writing.....3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Mathematics 151, Calculus I 5
Chemistry 111, General Chemistry 4
Humanities/Fine Arts.....3

Major Requirements

Computer Information Systems 254, Advanced C++ Programming 3
Communication 101, Introduction to Public Speaking 3
Drafting & Design 102, Machine Drawing, or
Machine Tool 130, Precision Inspection.....3
Engineering 103, Beginning Engineering Drawing 4
Machine Tool Technology 241, CNC Programming I.....2
Manufacturing Technology 111, Manufacturing Processes I 3
Mathematics 201, Calculus II 5
Mathematics 202, Calculus III 5
Mathematics 252, Differential Equations 4
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 3
Philosophy 102, Introduction to Logic.....3
Physics 201, Engineering Physics I.....5
Physics 202, Engineering Physics II 5

About the Area of Study

The Manufacturing Engineering program is intended to cover most of the freshman and sophomore pre-engineering requirements in a typical Bachelor engineering program. The curriculum is intensively mathematical and has challenging performance requirements. The level of rigor will lay the foundation in analytical reasoning and problem solving required to succeed in an engineering discipline.

Associate's Degree

By completing the 69-credit program in Manufacturing Engineering, you may apply for an Associate in Applied Science degree.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Mathematics

Associate in Science Degree – TRANSFER PROGRAM *Program Code 052*

Advisors: Chris Bendixen, (269) 927-8755, bendixen@lakemichigancollege.edu
Dr. Gerry Cox, (269) 927-1000 ext. 5078, cox@lakemichigancollege.edu
Jim Larson, (269) 927-8962, larson@lakemichigancollege.edu
Peter Brown, (269) 927-8760, pbrown@lakemichigancollege.edu
Brenda Shepard, (269) 927-8781, bshepard@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
**Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
Physics 201, Engineering Physics I 5
Mathematics 151, Calculus I 5
Natural Sciences 4
Social Sciences 3
*Humanities/Fine Arts 6

Major Requirements

Mathematics 201, Calculus II 5
Mathematics 202, Calculus III 5
Mathematics 252, Differential Equations 4
Physics 202, Engineering Physics II 5
General Electives 8

**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

Mathematics is an art, science, and language that encompasses the beauty of pattern and structure, the challenge of uncertainty and abstraction, and the excitement of solving problems. It provides a foundation for much of modern human society. Courses cover the range of basic mathematical functions to more advanced work with calculus, statistics and differential equations. Mathematics students hone their ability to reason effectively and write clearly.

Many careers are open to Mathematics majors. Some pursue graduate degrees or become teachers, and others choose among several professions. Potential fields include law, medicine, business, communication, actuarial science, academic or industrial research, consulting, writing, editing, computer science, statistics, and operations research. Consult a faculty advisor for specific guidance. There is a 61-credit degree requirement needed for graduation.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Mechatronics Technology

Level 1 Certificate – Mechatronics Technology *Program Code MCTR*

Advisor: Kevin Kreitner, (269) 927-1000 ext. 3033, kkreitner@lakemichigancollege.edu

Degree Requirements .....Credit Hours

Mechatronics Technology Certificate Requirements

Electronics 100, DC Electricity 4
Electronics 106, AC Electricity 3
Manufacturing Technology 120,
Fundamentals of Programmable Controllers 2
Manufacturing Technology 122, Introduction to Robotics 2
Manufacturing Technology 222, Industrial Robotics.....4
Manufacturing Technology 224, Robotics Infra-red Systems.....2

Some courses may be offered in Open Entry/Open Exit (OE/OE) format. See course description.

About the Area of Study

The Mechatronics program provides comprehensive instruction and hands-on experience with Mechanical Systems, Electronics, Fluid Power, Automation and Robotics. Combining science and technology, the Mechatronics program provides students a comprehensive array of job-ready skills that involve integrating technologies and systems-thinking required to effectively problem solve, program, operate and maintain electromechanical and automated equipment.

Certificate

When you complete the 17-credit Mechatronics Technology Level 1 certificate courses you may apply for the certificate of achievement. This allows you to enter the job market with basic, entry-level skills. Credit earned can be applied toward your associate's degree.

Mechatronics Technology

Associate in Applied Science Degree *Program Code MECT*

Advisor: Kevin Kreitner, (269) 927-1000 ext. 3033, kkreitner@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
English 103, Technical Writing, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Mathematics 100, Applied Mathematics, or
Mathematics 122, Intermediate Algebra, or
Mathematics 123, Quantitative Reasoning.....4
Physics 110, Technical Physics 4
Humanities/Fine Arts.....3

Major Requirements

Electronics 100, DC Electricity 4
Electronics 106, AC Electricity 3
Electronics 111, Semiconductors 4
Electronics 113, Digital Electronics.....3
Electronics 151, Transformers, Motors and Motor Controls 4
Electronics 152, Electrical Motor Controls II 4
Industrial Maintenance Technology 204,
Basic Hydraulics and Pneumatics 2
Machine Tool Technology 110, Machine Tool I 3
Manufacturing Technology 120,
Fundamentals of Programmable Controllers 2
Manufacturing Technology 122, Introduction to Robotics 2
Manufacturing Technology 222, Industrial Robotics.....4
Manufacturing Technology 224, Robotics Infra-red Systems.....2
Mathematics 110, Technical Mathematics, or
Mathematics 130, Pre-Calculus Trigonometry, or
Mathematics 135, Precalculus Algebra/Trig 3
Trade Related Instruction 138, Industrial Safety.....1

Program Electives (Suggested but not required)

Electronics 109, Introduction to Residential Wiring.....4
Electronics 211, Soldering 1
Industrial Maintenance Technology 240,
Predictive and Preventive Maintenance 3
Trade Related Instruction 129, Electrical Code Study 2

Some courses may be offered in Open Entry/Open Exit (OE/OE) format. See course description.

About the Area of Study

The Mechatronics program provides comprehensive instruction and hands-on experience with Mechanical Systems, Electronics, Fluid Power, Automation and Robotics. Combining science and technology, the Mechatronics program provides students a comprehensive array of job-ready skills that involve integrating technologies and systems-thinking required to effectively problem solve, program, operate and maintain electromechanical and automated equipment.

Associate's Degree

When you complete the 61-credit Mechatronics Technology program, you may apply for an Associate in Applied Science degree.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Sample Course Sequence

An advisor will help you develop course program sequences**.**

Medical Assisting

Certificate of Achievement *Program Code 207*

Associate in Applied Science Degree *Program Code MEAS*

Advisors: LaToya Mason, (269) 927-4086, lmason@lakemichigancollege.edu
Student Services Academic Advising, (269) 927-8128

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Mathematics 122, Intermediate Algebra, or
Mathematics 123, Quantitative Reasoning.....4
200-Level Biology or 100-Level Chemistry 4
Humanities/Fine Arts.....3

Major Requirements

*Biology 110, Human Anatomy & Physiology.....4
*Health 101, Introduction to Allied Healthcare Careers.....1
*Health 103, Medical Terminology 2
*Medical Assisting 102, Law & Ethics for Medical Assisting 3
*Medical Assisting 104, Medical Office Procedures I 3
*Medical Assisting 201, Applied Communications for Medical Assisting 3
*Medical Assisting 202, Human Disease Overview 2
*Medical Assisting 203, Pharmacology for Medical Assisting 3
*Medical Assisting 204, Medical Assisting Clinical Lab I.....4
*Medical Assisting 211, Medical Office Procedures II 3
*Medical Assisting 212, Medical Coding 3
*Medical Assisting 213, Phlebotomy.....2
*Medical Assisting 214, Medical Assisting Clinical Lab II 4
*Medical Assisting 221, Medical Assistant Externship 3
*Medical Assisting 222, Medical Assistant Certification Review.....3

*Courses required for Certificate

About the Area of Study

The Medical Assisting program prepares students for highly skilled, entry-level positions as Medical Assistants in the health care industry. Students will learn the administrative and clinical skills that are expected of Medical Assistants. Upon completion of the program, students will have the necessary skills to function effectively in a variety of health care settings.

Certificate and Degree Options

Upon completion of the 43-credit program you may apply for a Certificate of Achievement.

When you complete the 63-credit program you may apply for an Associate in Applied Science degree.

Program Accreditation

The certificate in Medical Assisting is approved by the Commission on Accreditation of Allied Health Education Programs (CAAHEP), 25400 U.S. Highway 19 North, Suite 158, Clearwater, FL 33763, Phone: 727-210-2350. caahep.org

Music

Associate in Arts Degree – TRANSFER PROGRAM *Program Code 035*

Advisor: John Owens, (269) 927-6588, jowens2@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
**Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
**Mathematics.....3
*Natural Sciences.....8
Social Sciences.....3
*Humanities/ Fine Arts.....6

Major Requirements

Requires at least one course in MUSI 3
General Electives.....27

Please refer to pages the Music course descriptions for a complete list of courses that are offered at LMC.

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

Career Options

The field of music offers many possibilities for a fulfilling and rewarding career. Job opportunities exist in diverse areas such as music education, performance, therapy, and technology, as well as church music, songwriting, publishing, licensing, the business of music, instrument building and repair, and many others. Completing an associate's degree with a music concentration can provide the first step in preparing for a career as a musician.

About the Area of Study

The Music curriculum prepares you for opportunities that require a traditional degree and provides an outlet for your performance skills. Coursework is available if you are interested solely in advancing your music skills or earning the first two years of a four-year degree in Music leading to a Bachelor of Arts, Bachelor of Music Education, or Bachelor of Science degree.

Applied music courses give you direct contact with performance faculty who help you improve your technical competence on your instrument or in voice. Music theory and history are offered for a better appreciation of the art form. Ensembles include Jazz Band, Rock/Pop Music Ensemble, Symphonic Wind Ensemble, Concert Choir, String Ensemble, and "Voices" LMC.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer.**

Music

Associate in Applied Science Degree *Program Code 215*

Advisor: John Owens, **(269) 927-6588**, jowens2@lakemichigancollege.edu

---

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition..... 3
English 102, English Composition, or
English 103, Technical Writing, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Natural Sciences.....4
Mathematics 3
Humanities/Fine Arts.....3

Major Requirements

Music 100+ or 200+, Beginning Applied Music.....8
Music 101, Concert Choir or
Music 103, Symphonic Wind Ensemble-Southshore Concert Band 8
Music 114, Piano Class I 2
Music 115, Piano Class II 2
Music 162, Basic Music I 3
Music 163, Basic Music II.....3
Music 164, Aural Comprehension I 1
Music 165, Aural Comprehension II.....1
Music 213, Music History I 3
Music 214, Music History II 3
Music 262, Basic Music III.....3
Music 263, Basic Music IV 3
Music 264, Aural Comprehension III.....1
Music 265, Aural Comprehension IV 1

Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

Career Options

The field of music offers many possibilities for a fulfilling and rewarding career. Job opportunities exist in diverse areas such as music education, performance, therapy, and technology, as well as church music, songwriting, publishing, licensing, the business of music, instrument building and repair, and many others. Completing an associate's degree with a music concentration can provide the first step in preparing for a career as a musician.

About the Area of Study

The Music curriculum prepares you for opportunities that require a four-year degree and provides an opportunity to hone your performance skills. Coursework is available if you are interested solely in advancing your music skills or earning the first two years of a four-year degree in Music leading to a Bachelor of Arts, Bachelor of Music Education, or Bachelor of Science degree.

Applied music courses give you direct contact with performance faculty who help you improve your technical competence on your instrument or in voice. Music theory and history are offered for a better appreciation of the art form. Ensembles include Jazz Band, Rock/Pop Music Ensemble, Symphonic Wind Ensemble, Concert Choir, String Ensemble, and "Voices" LMC.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer.**

Nursing (Registered)

Associate in Applied Science Degree *Program Code 210*

Pre-Nursing Advisors: Student Services Academic Advising, (269) 927-8128
Transfer students and re-admission students: call Kathleen Szymanski at (269) 927-8864 for information.
Appointments are made by the Health Science Administrative Coordinator, Erin McGuire, (269) 927-8768, nursing@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Biology 101, Biological Science, or
Biology 110, Basic Human Anatomy & Physiology 4
Mathematics 122, Intermediate Algebra, or
Mathematics 123, Quantitative Reasoning 4
Humanities/Fine Arts 3

Major Requirements

Biology 205, Human Anatomy 4
Biology 206, Physiology 4
*Chemistry 104, Fundamentals of General, Organic and Biochemistry 4
**Health 113 or Hospitality 113, Nutrition and Diet Therapy 3
Nursing 130, Pharmacology I 2
Nursing 135, Pharmacology II 2
Nursing 180, Nursing Fundamentals 6
Nursing 185, Women's Health 4
Nursing 186, Medical-Surgical Nursing I 3
Nursing 187, Medical-Surgical Nursing II 3
Nursing 280, Community Mental Health 4
Nursing 281, Medical-Surgical Nursing III 3
Nursing 282, Medical-Surgical Nursing IV 3
Nursing 285, Children's Health 4
Nursing 286, Medical-Surgical Health V 3
Nursing 287, Medical-Surgical Health VI 3
Nursing 288, Current Issues in Nursing 1
Psychology 201, Introduction to Psychology 3

Note: Students must have at least a "C" grade in all courses required for the nursing degree. There is also a ten-year time limit on science and math courses accepted for program entrance.

*CHEM 105 Fundamentals of Inorganic Chemistry, if taken prior to Fall 2010, may be substituted for CHEM 104 requirement. CHEM 111 or a transfer equivalent may also be substituted for CHEM 104.

** Health 113 and Hospitality 113 are equivalent courses. The Hospitality course is no longer offered, but can be used for this requirement.

Entrance into each semester of Nursing classes requires completion of all courses, including General Education courses, from the previous semester, according to the course sequence. General Education courses may be taken earlier, but not later, than listed.

Sample Course Sequence

The following course sequences are recommended if you want to complete the entire ADN RN in two years. It is a rigorous schedule and many students prefer to ease the load by completing some or all of the general education requirements prior to beginning nursing classes. An advisor will help you make necessary changes to this sample schedule.

Associate Degree

Pre-Program	Semester 1	Semester 2
BIOL 101	PSYC 201	ENGL 102
MATH 123	HEAL 113	NURS 185
BIOL 205	NURS 180	NURS 186
CHEM 104	NURS 130	NURS 187
BIOL 206		NURS 135
ENGL 101		

Semester 3	Semester 4
Humanities	POSC 101 or POSC 102 or
NURS 280	HIST 201 or HIST 202
NURS 281	NURS 285
NURS 282	NURS 286
	NURS 287
	NURS 288

Program Accreditation

The associate's degree Nursing program is approved by the Accreditation Commission for Education in Nursing, Inc., (ACEN), 3343 Peachtree Road NE Suite 850 Atlanta, GA 30326, Phone: 404-975-5000. acenursing.org. This agency is a resource for information about length of programs and required tuition and fees. There is a 79-credit degree requirement needed for graduation.

Nursing (Registered) - Continued

About the Area of Study

The Associate Degree Nursing (ADN) program qualifies graduates to take the National Council Licensure Exam (NCLEX-RN) leading to state licensure as a Registered Nurse (RN).

Licensed Practical Nurses (LPNs) who meet Advanced Standing requirements (see nursing student handbook or program advisor) may enter the second year of the nursing program after completing the support courses from the first year of the program and qualifying for admission to the associate's degree program.

Nursing program applicants should be aware that the Michigan Department of Licensing and Regulatory Affairs in its Practice Act, states that it can deny a license to an applicant if any of the following are true:

1. Has been convicted of a criminal offense in a court of law.
2. Is habitually intemperate in the use of alcoholic beverages.
3. Is addicted to, or has improperly obtained, possessed, used or distributed habit-forming drugs or narcotics.
4. Is guilty of dishonesty or unethical conduct.
5. Has violated or aided or abetted others in violation of any provision of this act.

This is not an inclusive list. If there are questions about a situation, please call the Michigan Board of Nursing at 517-335-0918.

Clinical Assignments

In addition to classroom work, students must participate in clinical assignments. The eight-hour or 12-hour shifts are scheduled during days, evenings, and weekends at facilities throughout the region and attendance is required. Because clinical schedules are not flexible, students will need to work their schedule around these times, have dependable child care, and have access to dependable transportation in order to travel to the assignments. Students should also plan for additional time outside of the printed schedule for practice, clinical preparation, and study.

Nursing Program Handbook

In addition to the rules stated in this catalog, Lake Michigan College Nursing students are required to abide by rules stated in the Nursing Student Handbook. Students can view a copy of the Nursing Student Handbook by contacting the Health Science advisor or the Nursing Department.

As a student in the Nursing program, students should expect costs greater than the average LMC student. These additional costs will include a greater number of textbooks, school-approved uniforms, a pre-program physical exam, immunization for specified communicable diseases, name tags, testing and background checks.

Transfer Options

LMC's Nursing program is designed to transfer to and has articulation relationships with Western Michigan University, Bethel College, Chamberlain College, and University of Michigan-Flint which operate degree completion programs for a bachelor's degree in Nursing, or to other four-year institutions depending on their policies. Talk to the LMC Nursing program advisor for more information about transferring credit.

Pharmacy Technician

Certificate of Achievement *Program Code PHTC*

Associate in Applied Science Degree *Program Code PHAR*

Advisors: LaToya Mason, (269) 926-4086, lmason@lakemichigancollege.edu
Student Services Academic Advising, (269) 927-8128

Degree Requirements .....Credit Hours

Prerequisite Courses (required to begin program)

Biology 110, Human Anatomy & Physiology, or
Biology 205, Human Anatomy, or
Biology 206, Principles of Human Physiology 4
Health 101, Introduction to Allied Healthcare Careers 1
Health 103, Medical Terminology 2

General Education Requirements

*English 101, English Composition 3
*English 102, English Composition, or
English 103, Technical Writing, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
*Mathematics 122, Intermediate Algebra, or
Mathematics 123, Quantitative Reasoning 4
Humanities/Fine Arts 3

Major Requirements

Biology 205, Human Anatomy, or
Biology 206, Principles of Human Physiology 4
*Business 115, Principles of Customer Service 3
*Business 215, Business Communications 3
*Chemistry 104, Fundamentals of General, Organic and Biochemistry 4
*Health 113, Nutrition and Diet Therapy 3
*Pharmacy Technician 201, Pharmacy Tech Foundations 3
*Pharmacy Technician 211, Pharmaceutical Concepts & Calculations 3
*Pharmacy Technician 212, Prescription Processing & Simulations 4
*Pharmacy Technician 221, Pharmacy Tech Clinical I 4
*Pharmacy Technician 222, Pharmacy Tech Exam Review 3
*Pharmacy Technician 223, Pharmacy Tech Exam Clinical II 4
Psychology 201, Introduction to Psychology 3

*Classes required for Certificate Program

About the Area of Study

The Pharmacy Technician program prepares students for entry level pharmacy technician positions in hospitals and retail stores. Students will gain valuable hands-on experience that will prepare them to work under the supervision of a pharmacist.

Certificate and Degree Options

Upon completion of the 51-credit program you may apply for a Certificate of Achievement.

When you complete the 64-credit program you may apply for an Associate in Applied Science degree.

Sample Program Sequences

Certificate Program

Semester 1	Semester 2	Semester 3
CHEM 104	PHAR 211	BUSA 115
ENGL 101	PHAR 212	BUSA 215
MATH 122 or MATH 123	ENGL 102 or ENGL 103	PHAR 221
PHAR 201	HEAL 113	

Semester 4
PHAR 222
PHAR 223

Associate Degree Program

Semester 1	Semester 2	Semester 3
CHEM 104	PHAR 211	BUSA 115
ENGL 101	PHAR 212	BUSA 215
MATH 122 or MATH 123	ENGL 102 or ENGL 103	PHAR 221
PHAR 201	HEAL 113	

Semester 4	Semester 5
PHAR 222	BIOL 205, or BIO 206 BIOL 210
PHAR 223	PSYC 201
	POSC 101 or POSC 102 or HIST 201, or HIST 202
	Humanities/Fine Arts

Philosophy

Associate in Arts Degree – TRANSFER PROGRAM *Program Code 022*

Advisors: Dr. Denise Scameheorn, (269) 927-8775, scameheo@lakemichigancollege.edu
Dr. Amy Scrima, (269) 927-8777, scrima@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
**Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
**Mathematics 3
*Natural Sciences 8
Social Sciences 3
*Humanities/Fine Arts 6

Major Requirements

Required at least one course in PHIL 3
General Electives 27

The following Philosophy classes are offered at LMC:

Philosophy 101, Introduction to Philosophy 3
Philosophy 102, Introduction to Logic 3
Philosophy 215, Introduction to Religious Thought 3
Philosophy 250, Sophomore Seminar in Philosophy 3

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

Philosophy is a discipline that deals with all learning exclusive of technical precepts and the practical arts. Courses include study in areas such as logic, ethics, religious thought, and issues with technology, business, and medicine.

If you are pursuing a bachelor's degree in Philosophy, you may complete your first two years of coursework at Lake Michigan College. All Philosophy courses are transferable to other institutions in Michigan and elsewhere.

Well-prepared Philosophy majors have done well consistently in the Graduate Record Examination (GRE) and Law School Aptitude Test (LSAT).

You may complete the requirements for an Associate in Arts degree. Competency in a foreign language is not a degree requirement. However, Philosophy majors are strongly urged to complete at least two semesters of French, German, or Spanish. As a Philosophy major, you should seek a broad-based education through careful selection of courses. Consult the faculty advisor for specific guidance.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Physical Education and Wellness

Associate in Science Degree – TRANSFER PROGRAM *Program Code 091*

Advisor: Dan Meyer, (269) 927-8745, meyer@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
**Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 3
Psychology 201, Introduction to Psychology 3
*Natural Science 8
Mathematics 3
*Humanities/Fine Arts 6

Major Requirements

Biology 205, Human Anatomy 4
Biology 206, Principles of Human Physiology 4
Communication 101, Introduction to Public Speaking 3
Physical Education 201, Foundations of Physical Education 3
Physics 101, General Physics 5
Psychology 203, Human Development 3
General Electives 6

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

Physical Science offers an introduction to the physical sciences (chemistry, geology, and physics); provides coursework for you to complete your general education requirements in Science; provides initial preparation work in a science field. There is a 60-credit degree requirement needed for graduation.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Physical Science

Associate in Science Degree – TRANSFER PROGRAM *Program Code 063*

Advisor: Dr. Cole Lovett, (269) 927-8744, lovett@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
** Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
Chemistry 111, General Chemistry I 4
Physical Science 104, Physical Geology 4
Mathematics 151, Calculus I 5
Social Sciences 3
*Humanities/ Fine Arts 6

Major Requirements

Chemistry 112, General Chemistry II 4
Physics 101, General Physics 5
Physics 102, General Physics II 5
General Electives 14

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

Physical Science offers an introduction to the physical sciences (chemistry, geology, and physics). The program provides coursework for you to complete towards your general education requirements in Science and provides initial preparation work in a science field. There is a 60-credit degree requirement needed for graduation.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Physics

Associate in Science Degree – TRANSFER PROGRAM *Program Code 065*

Advisor: John Stahl, (269) 927-8184, jstahl@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
** Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
Chemistry 111, General Chemistry I 4
Physics 201, Engineering Physics I.....5
Mathematics 151, Calculus I 5
Social Sciences.....3
*Humanities/Fine Arts.....6

Major Requirements

Mathematics 201, Calculus II 5
Mathematics 202, Calculus III 5
Mathematics 252, Differential Equations 4
Chemistry 112, General Chemistry II 4
Physics 202, Engineering Physics II 5
General Electives.....4

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

Physics is a rigorous program applying mathematics to the fundamental concepts governing the natural world. You will develop a solid foundation in analytical reasoning and problem solving. Hands on laboratories are used to enhance the lecture material and introduce you to the laboratory environment. The physics curriculum is an intensive and challenging program intended to prepare you for transfer into a Bachelor program at most institutions. There is a 60-credit degree requirement needed for graduation.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Political Science

Associate in Arts Degree – TRANSFER PROGRAM *Program Code 014*

Advisor: Dr. Tiffany Bohm, (269) 927-8877, tbohm@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
** Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
**Mathematics 3
*Natural Sciences 8
*Social Sciences 3
*Humanities/Fine Arts 6

Major Requirements

Requires at least one course in POSC 3
General Electives 27

The following Political Science classes are offered at LMC:

Political Science 101, National Government 3
Political Science 102, State Government 3
Political Science 202, Comparative Governments 3
Political Science 203, International Relations 3
Political Science 204, Political Parties 3
Political Science 250, Introduction to Social Science Research 3
Political Science 260, Introduction to Public Policy 3

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

Political Science is the study of local, state, national, and international governments and their impact upon human society. If your goal is to pursue a bachelor's degree in Political Science, you may complete your first two years of coursework at Lake Michigan College. Political Science courses are transferable to other institutions in Michigan and elsewhere. Political Science is recommended if you are interested in government service, elective politics or a law degree. Consult the faculty advisor for specific guidance. There is a 60-credit degree requirement needed for graduation.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Psychology

Associate in Arts Degree – TRANSFER PROGRAM *Program Code 012*

Advisors: Dr. Denise Scameheorn, (269) 927-8775, scameheo@lakemichigancollege.edu
Dr. Amy Scrima, (269) 927-8777, ascrima@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
** Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
**Mathematics.....3
*Natural Sciences.....8
Social Sciences.....3
*Humanities/Fine Arts.....6

Major Requirements

Requires at least one course in PSYC 3
General Electives.....27

The following Psychology classes are offered at LMC:

Psychology 201, Introduction to Psychology.....3
Psychology 203, Human Development.....3
Psychology 204, Child Development and Personality 3
Psychology 205, Interpersonal Relations.....3
Psychology 206, Social Psychology 3
Psychology 230, Psychology of Stereotyping and Prejudice 3
Psychology 231, Abnormal Psychology 3
Psychology 250, Introduction to Social Science Research.....3

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

Psychology is the scientific study of behavior. Through research and critical thought we will explore the biological, behavioral, developmental and social processes that shape and govern human behavior. If you plan to major in Psychology at a four-year university, you may complete the first two years of your program at Lake Michigan College.

You have a unique opportunity to conduct research in Psychology 250. Research projects that qualify are published in The Lake Michigan College Journal of Psychology. Students may be eligible for membership in Psi Beta, the national honor society for Psychology students at community and junior colleges. Consult a faculty advisor for specific guidance. There is a 60-credit degree requirement needed for graduation.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer.**

Radiologic Technology

Associate in Applied Science Degree *Program Code 221*

Advisors: Ildiko Widman M.S., (CT)(RT)(R), (269)-927-5102**,** widman@lakemichigancollege.edu
Student Services Academic Advising, (269) 927-8128

Admission Requirements

This program has special admission procedures based on a program-specific GPA ranking and limited enrollment. See the specific admission requirements for Health Science students. Contact Student Services Academic Advising at ext. 8128 for an academic advising appointment or the Health Science office at ext. 8768 for complete details. An advisor will help you determine prerequisites that are required and designed to prepare you for training in the program.

Degree Requirements .....Credit Hours

General Education Requirements

+English 101, English Composition 3
+English 102, English Composition 3
+Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
+Mathematics 122, Intermediate Algebra***, or
Mathematics 123, Quantitative Reasoning.....4
+Biology 101, Biological Science, or
Biology 110, Human Anatomy & Physiology, or
Biology 111, Principles of Biology I, or
Biology 112, Principles of Biology II 4
+Humanities/Fine Arts 3

Major Requirements

+Biology 205, Human Anatomy.....4
+Physical Science 101, Physical Science: Chemistry and Physics 4
+Psychology 201, Introduction to Psychology 4
Radiologic Technology 130, Introduction to Radiography 3
Radiologic Technology 131, Radiographic Positioning I 6
Radiologic Technology 134, Radiographic Physics 4
Radiologic Technology 138, Clinical Experience I 2
Radiologic Technology 139, Common Equipment and Procedures.....4
Radiologic Technology 140, Radiographic Positioning II 3
Radiologic Technology 141, Contract Studies 3
Radiologic Technology 143, Clinical Experience II 3
Radiologic Technology 144, Radiographic Positioning III 3
Radiologic Technology 145, Radiographic Protection and Biology 2
Radiologic Technology 228, Computer Applications in Medical Imaging.....3
Radiologic Technology 229, Clinical Experience III 4
Radiologic Technology 232, Clinical Experience IV 3
Radiologic Technology 240, Radiographic Quality.....4
Radiologic Technology 241, Sectional Anatomy 3
+Reading 110, Medical Terminology, or
Health 103, Medical Terminology 1

+Must be completed BEFORE admittance into the program

***RADT will continue to accept Math 122 until fall 2018

Radiologic Technology Program Handbook

In addition to the rules stated in this catalog, Radiologic Technology students are required to abide by the rules stated in the Radiologic Technology Program Handbook, which may be reviewed in the college library.

About the Area of Study

The Radiologic Technology program trains you to become a radiologic technologist. This 21-month program includes a summer semester of courses. You will obtain clinical experience at local healthcare facilities in addition to formal classroom instruction provided on campus.

Radiologic technologists are employed in hospitals, clinics, commercial x-ray laboratories, and physician offices where they use radiation to produce images of the bones and organs of the human body. In addition to preparing patients and operating equipment, radiologic technologists also work with electronic medical records and may prepare exam schedules, evaluate equipment purchases, or manage a radiology department.

Program Accreditation

This program is accredited by the Joint Review Committee on Education in Radiologic Technology, 20 N. Wacker Dr., Suite 2850, Chicago, IL 60606-3182; Phone 312-704-5300. jrcert.org, and email@jrcert.org.

Associate's Degree

Upon successful completion of the Radiologic Technology program, you may apply for an Associate in Applied Science degree.

Certification Examination

Graduates are eligible to apply to sit for the American Registry of Radiologic Technologists (ARRT) national certification examination. Any applicant who has been convicted of a felony and some misdemeanors should pre-apply to ARRT for determination of eligibility to sit for the national certification examination.

Sample Course Sequence

An advisor will help you make necessary changes to this recommended sequence.

Associate Degree Program

Semester 1	Semester 2	Semester 3
RADT 130	RADT 138	RADT 143
RADT 131	RADT 139	RADT 144
RADT 134	RADT 140	RADT 145
	RADT 141	

Semester 4	Semester 5
RADT 228	RADT 232
RADT 229	RADT 240
	RADT 241

Skilled Trades Technology

Certificate of Achievement *Program Code 382*

Associate in Applied Science Degree *Program Code SKTT*

Advisor: Kevin Kreitner, (269) 927-1000 ext. 3033, kkreitner@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
English 103, Technical Writing, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Mathematics 100, Applied Mathematics, or
Mathematics 122, Intermediate Algebra, or
Mathematics 123, Quantitative Reasoning.....4
Physics 110, Technical Physics 4
Humanities/Fine Arts 3

Major Requirements

Mathematics 110, Technical Mathematics, or
Trade Related Instruction 107, Applied Geometry/Trigonometry 4

At least 36 hours of credit from a Department of Labor (DOL) registered apprenticeship is required. These courses should be part of a planned progran of study as designed by a sponsored company. Please work with an advisor for course selection.

About the Area of Study

In cooperation with local employers, Lake Michigan College provides training for men and women enrolled in formal Apprenticeship Agreements approved by the U.S. Department of Labor, Office of Apprenticeship and Training. Such training programs include academic instruction as well as on-the-job training and usually take a minimum of two years to four years to complete.

Certificate and Degree Options

A student who has completed the academic requirements of a U.S. Department of Labor Registered Apprenticeship and completed a minimum of 30 credit hours from the Major Requirements may apply for a Certificate of Achievement from Lake Michigan College.

The Skilled Trades Technology program is designed for those apprentices that have received a Completion Certificate from the U.S. Department of Labor or possess a journeyman card. The degree incorporates the courses taken during the student's apprenticeship training, additional advanced level courses, and general education courses. Upon completion of the degree program with a minimum of 60 credit hours, a student may apply for an Associate in Applied Science degree.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Sociology/ Social Work (Pre)

Associate in Arts Degree – TRANSFER PROGRAM *Program Code 011*

Advisors: Dr. Michelle Stone, **(269) 927-8619**, stone@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
** Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
Mathematics 3
*Natural Sciences.....8
Social Sciences 3
*Humanities/Fine Arts.....6

Major Requirements

Requires at least one course in SOC.....3
General Electives.....27

The following History classes are offered at LMC:

Sociology 101, Principles of Sociology 3
Sociology 201, Modern Social Problems 3
Sociology 202, Marriage and the Family 3
Sociology 204, The Field of Social Work.....3
Sociology 205, Race and Ethnic Relations 3
Sociology 210, Sociology of Aging 3
Sociology 250, Introduction to Social Science Research.....3

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

The discipline of Sociology is concerned with the social and cultural life of humans. Sociologists study the organization, functions, and problems of human societies and groups. The dynamics of human relationships are of primary interest along with the analysis of culture, social systems, socialization, social classes, poverty, minorities and majorities, population, social institutions, and social change.

Occupations in sociology/social work usually require a bachelor's or master's degree. The Sociology discipline at Lake Michigan College provides you with the first two years of a bachelor's program. You should work with your advisor to check with four-year colleges and universities regarding specific requirements. There is a 60-credit degree requirement needed for graduation.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Theatre

Associate in Arts Degree – TRANSFER PROGRAM *Program Code 046*

Advisors: Dr. Denise Scameheorn, (269) 927-8775, scameheo@lakemichigancollege.edu
Dr. Amy Scrima, (269) 927-8777, ascrima@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
**Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
**Mathematics 3
*Natural Sciences 8
Social Sciences 3
*Humanities/Fine Arts 6

Major Requirements

Requires at least one course in DRAM 3
General Electives 27

The Following Theatre classes are offered at LMC:

Drama 110, Principles of Practices of Acting I 3
Drama 110, Principles of Practices of Acting II 3
Drama 112, Stagecraft 3
Drama 113, Musical Theatre Performance I 3
Drama 175, Summer Theatre Workshop 6
Drama 201, Introduction to Theatre 3
Drama 202, Theatre Practicum 3
Drama 220, Introduction to Theatre for Young Audiences and Creative Dramatics 3

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

About the Area of Study

Theatre courses help you develop an appreciation of the discipline as well as to expand your personal and professional enrichment through study in acting and stagecraft. The curriculum is comprised of courses dealing with dramatic theory and appreciation, design and technical theatre, and performance. Courses are open to all students.

Credits apply toward the Associate in Arts degree. If you are planning to transfer to a four-year school you should obtain degree requirements for the freshman and sophomore years at your selected school and consult with the Theatre advisor to plan your individualized program. There is a 60-credit degree requirement needed for graduation.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Undecided

Associate in Arts Degree – TRANSFER PROGRAM *Program Code UAAT*

Advisor: Dr. Gary C. Roberts, (269) 927-8771, roberts@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
**Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
Mathematics 3
*Natural Sciences 8
Social Sciences 3
*Humanities/Fine Arts 6

Major Requirements

Requires at least one additional course in Social Science 3
Requires at least one additional course in Humanities/ Fine Arts 3
General Electives 24

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Undecided

Associate in Science Degree – TRANSFER PROGRAM *Program Code UAST*

Advisor: Dr. Gary C. Roberts, (269) 927-8771, roberts@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
**Physical Education 200, Healthful Living, or
Physical Education 212, Health and Fitness, or
Physical Education 214, Personal Health 1
Mathematics 3
*Natural Sciences 8
Social Sciences 3
*Humanities/Fine Arts 6

Major Requirements

Requires at least one additional course in Natural Sciences 4
Requires at least one additional course in Mathematics 3
General Electives 23

*From at least two academic disciplines.
**Credit hours listed are based on minimum earned. For example, MATH courses have 3, 4, or 5 credits.

Please see catalog for courses that have Honors equivalents and meet MTA transfer guidelines. Completion of the MTA requires 30 credits of coursework in the 5 MTA distribution areas.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Welding Production Technology

Level 1 Certificate – Welding Production Technology *Program Code WEPT*

Advisor: Nathan Kramb, (269) 927-4244, nkramb@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

Welding Production Technology Certificate Requirements

Welding Production Technology 101, Fabrication 2
Welding Production Technology 102,
SMAW (Shielded Metal Arc Welding) I 2
Welding Production Technology 103, GMAW (Gas Metal Arc Welding) I 2
Welding Production Technology 104,
Welding Blueprint Reading & Symbols 2
Welding Production Technology 105, Welding Fabrication I 2
Welding Production Technology 106, Welding Metallurgy 2
Welding Production Technology 202,
GTAW (Gas Tungsten Arc Welding) I 2
Machine Tool Technology 110, Machine Tool I 3

Some courses may be offered in Open Entry/Open Exit (OE/OE) format. See course description.

About the Area of Study

The Welding Production Technology program prepares students for employment in the construction, manufacturing, and utilities industries. The program provides instruction in the most common manual welding and cutting processes. Training includes welding with "TIG", "Stick", "MIG", and flux cored wires for most common materials. Cutting is done both manually and mechanized with plasma and oxy-fuel systems. Training is geared to provide the skill base, knowledge, and professional attitude required to eventually become a highly skilled welder.

Certificate Options

When you complete the Welding Technology Level 1 certificate courses you may apply for the certificate of achievement. This allows you to enter the job market with basic, entry-level skills. Credit earned can be applied toward your associate's degree.

Welding Production Technology

Associate in Applied Science Degree *Program Code WDPT*

Advisor: Nathan Kramb, (269) 927-4244, nkramb@lakemichigancollege.edu

Degree Requirements ..... Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
English 103, Technical Writing, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Mathematics 100, Applied Mathematics, or
Mathematics 122, Intermediate Algebra, or
Mathematics 123, Quantitative Reasoning 4
Physics 110, Technical Physics 4
Humanities/Fine Arts 3

Major Requirements

*Machine Tool Technology 110, Machine Tool I 3
Machine Tool Technology 120, Machine Tool II 3
Machine Tool Technology 140, Introduction to Numerical Control (NC)
Computer Numerical Control (CNC) 2
Manufacturing Technology 111, Manufacturing Process I 3
Manufacturing Technology 122, Introduction to Robotics 2
Mathematics 110, Technical Math, or
Mathematics 130, Pre-Calculus Trigonometry, or
Mathematics 135, Pre-Calculus Algebra/Trig 3
Trade Related Instruction 134, Metallurgy and Heat Treatment 3
Trade Related Instruction 138, Industrial Safety 1
*Welding Production Technology 101, Fabrication 2
*Welding Production Technology 102,
SMAW (Shielded Metal Arc Welding) I 2
*Welding Production Technology 103, GMAW (Gas Metal Arc Welding) I 2
*Welding Production Technology 104,
Welding Blueprint Reading & Symbols 2
*Welding Production Technology 105, Welding Fabrication I 2
Welding Production Technology 200, Welding Fabrication II 2
Welding Production Technology 201, GMAW Welding II 2
*Welding Production Technology 202,
GTAW (Gas Tungsten Arc Welding) I 2
Welding Production Technology 203, GMAW Welding Production 2
Welding Production Technology 204, SMAW Welding Production 1
Welding Production Technology 205, GTAW Welding Production 1

*Courses required for certificate program.

Some courses may be offered in Open Entry/Open Exit (OE/OE) format. See course description.

About the Area of Study

The Welding Production Technology program prepares students for employment in the construction, manufacturing, and utilities industries. The program provides instruction in the most common manual welding and cutting processes. Training includes welding with "TIG", "Stick", "MIG", and flux cored wires for most common materials. Cutting is done both manually and mechanized with plasma and oxy-fuel systems. Training is geared to provide the skill base, knowledge, and professional attitude required to eventually become a highly skilled welder.

Certificate and Degree Options

When you complete the Welding Technology Level 1 certificate courses you may apply for the certificate of achievement. This allows you to enter the job market with basic, entry-level skills. Credit earned can be applied toward your associate's degree.

When you complete the 60-credit Welding Technology program, you may apply for an Associate in Applied Science degree.

Transfer Resources

If you are planning to transfer to a four-year college or university, you should become familiar with your chosen school's requirements. See your Academic Advisor for assistance in developing your Student Education Plan or visit **lakemichigancollege.edu/transfer**.

Sample Course Sequence

An advisor will help you develop course program sequences.

Wine and Viticulture Technology

Associate in Applied Science Degree *Program Code WINE*

Advisor: Michael Moyer, **(269) 927-8617**, mmoyer@lakemichigancollege.edu

Degree Requirements .....Credit Hours

General Education Requirements

English 101, English Composition 3
English 102, English Composition, or
English 103, Technical Writing, or
Communication 101, Introduction to Public Speaking 3
Political Science 101, National Government, or
Political Science 102, State Governments, or
History 201, American History, or
History 202, American History 3
Mathematics 123, Quantitative Reasoning 4
Agriculture 110, Agriculture Chemistry, or
Chemistry 104, Fundamentals of General,
Organic & Biochemistry,
Or Chemistry 111, General Chemistry 4
Humanities/Fine Arts 3

Major Requirements

Biology 120, Plant Biology 4
Business 207, Small Business Management or
Business 208, Advertising and Sales Promotion 3
Enology 101, Introduction to Enology and Viticulture 3
Enology 105, Wines of the World and Sensory Analysis 3
Enology 190, Enology Co-Op I 1
Enology 191, Enology Co-Op II 1
Enology 210, Wine Analysis and Quality Control 4
Enology 211, Winemaking and Fermentation 3
Enology 220, Winery Operations Management 3
Enology 290, Enology Co-Op III 3
Viticulture 110, Establishing a Vineyard.....3
Viticulture 120, Maintaining a Vineyard 3
Viticulture 220, Vineyard Diseases and Insects.....3
Viticulture 290, Viticulture Co-Op I 1
Viticulture 291, Viticulture Co-Op II 2

Sample Course Sequence

Fall	**Spring**
First Year	**First Year**
ENOL 101	VITI 110
ENOL 105	BIOL 120
AGRI 110 or	ENOL 210
CHEM 104 or	VITI 290
CHEM 111	BUSA 208
ENOL 190	

Summer	**Fall**
First Year	**Second Year**
VITI 120	ENOL 290
VITI 220	
VITI 291	
ENOL 220	
ENOL 211	
ENOL 191	

About the Area of Study

The Michigan wine industry is growing rapidly and is ripe with opportunity. It is currently home to over 100 wineries and 2,650 acres of wine grapes, which produce more than 1.3 million gallons of wine annually. Michigan is the fifth-ranked state in the U.S. in terms of wine grape production. The population centers geographically adjacent to Michigan create a viable market for the growth of Michigan tourism catalyzed by the expansion of the wine industry.

The AAS degree in Wine and Viticulture Technology emphasizes hands-on learning, where the college's vineyard blocks and teaching winery serve as classrooms. Areas of study include:

- Viticulture: grape growing
- Site selection
- Canopy management
- Pest control
- Harvest operations
- Enology: wine making
- Fermentation
- Aging
- Filtration and fining
- Bottling
- Business of wine
- Logistics
- Marketing & distribution

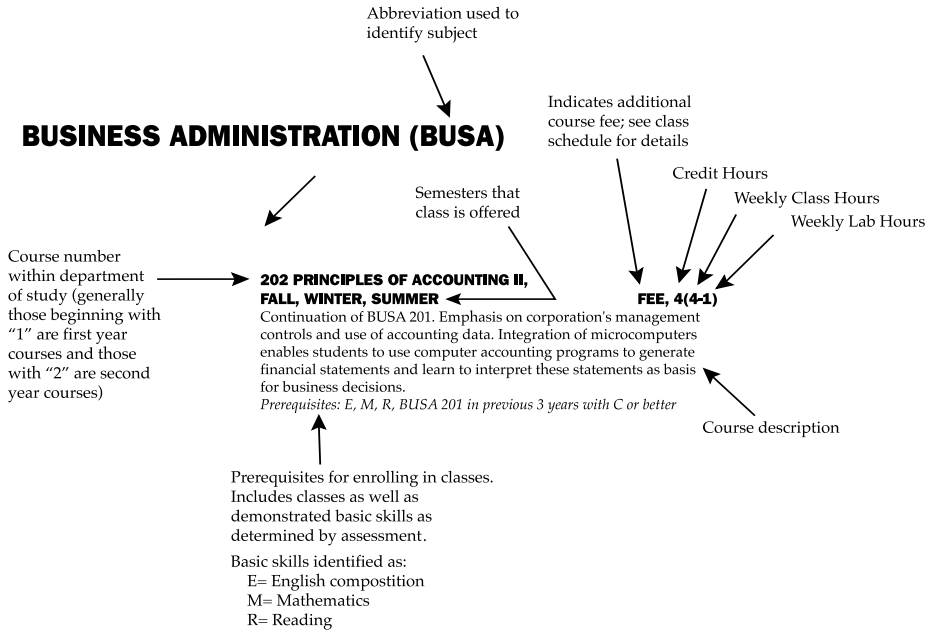
Future careers in the wine industry include, but are not limited to:

- Viticulturists and Vineyard Managers
- Winemakers and Enologists
- Tasting Room Managers and Event Coordinators
- Equipment sales, barrels sales, and other suppliers
- Equipment manufacturing and metal fabrication
- Custom crush
- Bulk wine sales and brokering
- Warehousing and logistics
- Wine distribution and sales

Course Descriptions

This section contains a description of all course offerings.
In using this course list, students should note the following:

How to Read Course Descriptions



Concurrent - may take course(s) at the same time

Co-requisite - must take course(s) at the same time

Equivalent - determined by department, chair, or full-time faculty

English, Math, and Reading Pre-Requisite Requirements

"E" English	Minimum Score
ACT English	18
Asset Writing, or	44
Compass Writing, or	78
SAT Verbal	490

"M" Math	Minimum Score
ACT Math	18
Asset Math, or	41
Compass Pre-Algebra, or	46
SAT Quantitative	440

"R" Reading	Minimum Score
ACT Reading	17
Compass Reading, or	78
SAT Verbal, or	490
Nelson Denny Reading	11.8

ALL PREREQUISITE COURSES REQUIRE A "C" OR BETTER UNLESS OTHERWISE NOTATED.

AGRICULTURE (AGRI)

110 AGRICULTURAL CHEMISTRY
FALL FEE 4(3-3)
This is a fundamental course in chemistry. Topics include an overview of basic inorganic, organic and biochemistry with applications to agriculture.
Prerequisites: E, R and MATH 095 or pass algebra proficiency test

ART (ART)

101 ART APPRECIATION I FALL 3 (3-0)
Introduction to appreciation of visual arts. Study of artistic styles that explains ideas about visual art and architecture through discussion and field trips. Open to all students.

102 ART APPRECIATION II SPRING 3 (3-0)
Explores visual arts through studio projects, slides, lectures and discussion. Work in basic elements of design and form organization through various two-dimensional and three-dimensional media. Open to all students.

105 WATERCOLOR I
SPRING FEE 2 (0-4)
Survey of painting techniques and issues of compositional problem solving through emphasis on elements of design--line, value, texture, color, form and space. Open to all students.
Recommended Prerequisites: ART 102, ART 103 and/or ART 112 or equivalents

106 WATERCOLOR II SPRING FEE 2 (0-4)
Advanced study in watercolor through investigation of elements of design for personal expression. Open to all students.
Prerequisite: ART 105

109 BASIC DESIGN (2-D) FALL FEE 3 (0-6)
A thorough investigation of the elements of design (line, texture, value, color, etc.) and principles of form organization to establish the visual language of the two-dimensional arts. Open to all students. Required for Art majors.

110 BASIC DESIGN (3-D) SPRING FEE 3 (0-6)
Focus on visual fundamentals of three-dimensional design and study of form as means of expression. Open to all students. Required for Art majors.

111 ART EDUCATION SPRING FEE 3 (2-2)
Explores a wide range of visual experiences. Emphasis on understanding child growth and development against a background of various painted, drawn and sculptured images. For students interested in teaching.
Prerequisites: E, R

115 PAINTING I SPRING FEE 3 (0-6)
Fundamentals of form and their relationships in painting. Range of subject matter includes portrait and figure studies. Open to all students.

116 PAINTING II SPRING 3 (0-6)
Further study in structural concerns of painting. Emphasis on discipline and integration of personal expression through principles of form, organization, movement, repetition, proportion, balance, etc. Open to all students.
Prerequisite: ART 115

120 CERAMICS I FALL, SPRING 3 (0-6)
Focus on materials, tools and special equipment used in working with clay. Investigation of firing procedures, preparation of clay and glazes and fundamentals of throwing pottery on wheel. Open to all students.

121 CERAMICS II FALL, SPRING 3 (0-6)
Advanced course in study of clay. Hand-building and/or wheel-throwing problems according to individual interests. Experiments in glazing. Open to all students.
Prerequisite: ART 120

122 DRAWING I FALL, SPRING 3 (0-6)
Explores the fundamentals of drawing. Investigation of the elements of design and other ideas underlining a successful drawing. Includes drawing portraits. Open to all students. Required for Art majors.

123 DRAWING II FALL, SPRING 3 (0-6)
Continued study in drawing. Emphasis on development of personal expression through use of line and value. Open to all students. Required for Art major.
Prerequisite: ART 122

130 BEGINNING GLASSBLOWING
FALL, SPRING FEE 3 (2-4)
A studio course designed in partnership with Waterstreet Glassworks to introduce the novice to the art of glass blowing and fusing. This is a team-taught, hands-on format that focuses on basic skills, techniques and studio operations that will give the novice an insight to hot glass and prepare them to progress to more in-depth instruction. The class will take place at the Waterstreet Glassworks facility at 138 Water Street in the Arts District in Benton Harbor.

200 HISTORY OF ART I FALL (ODD YEARS) 3 (3-0)
Lecture course that discusses a historical survey of architecture, sculpture and painting from Prehistoric Period to Gothic Period. Includes study of Egyptian, Greek, Roman and Romanesque art. Open to all students.
Prerequisites: E, R

201 HISTORY OF ART II FALL (EVEN YEARS) 3 (3-0)
Lecture course that discusses a historical survey of architecture, sculpture and painting from Renaissance to Twentieth Century. Focus on important aspects of Baroque, Neo-classical and Romantic art culminating in Modern Movement. Open to all students.
Prerequisites: E, R

202 TWENTIETH-CENTURY ART SPRING 3 (3-0)
Lecture course that addresses contemporary trends in painting and sculpting. Lectures supplemented with slides and videos engage students with major movements and developments in Europe and United States. Includes study of Impressionism and Post-Impressionism as foundations for understanding twentieth-century ideas. Open to all students.
Prerequisites: E, R

203 2OTH CENTURY ART HISTORY: 1900-1945
SPRING (EVEN YEARS) 3 (3-0)
Art from 1900 to 1945 will be discussed in terms of its origins, trends and the contributions of culture and technology. Major developments to be covered include Fauvism, Cubism, Expressionism, Dadaism, Surrealism and Abstract Expressionism. Photography and Architecture will be discussed, too. Open to all students.

204 20TH CENTURY ART HISTORY 1945-PRESENT
SPRING (ODD YEARS) 3 (3-0)
Major developments in Art from 1945 to Present, including Abstract Expressionist, Pop Art, Minimalism, Conceptual Art, Photo Realism, Neo-Expressionism and the Post-Modern era are discussed alongside the associated disciplines of Photography, Architecture and Graphic Design. Open to all students.

212 SCULPTURE I FALL 3 (0-6)
Basic sculpture forming techniques; investigation of form relationships through use of clay and other media. Emphasis on developing skills in manipulation of materials. Open to all students.

213 SCULPTURE II FALL 3 (0-6)
Advanced exploration of ideas and materials used in sculpture. Choice of wood, metal, or plaster for study. Emphasis on developing skills in articulating form. Open to all students.
Prerequisite: ART 212

251 STUDIO PROBLEMS: PAINTING SPRING 3 (0-6)
Advanced study in acrylic and/or oil painting, emphasis on development of technical skills according to individual student interest.
Prerequisites: ART 115, ART 116

252 STUDIO PROBLEMS: CERAMICS
FALL, SPRING 3 (0-6)
Advanced study in ceramics with more individualized directions. Hand-building and wheel-thrown objects as well as experiments with glaze compounds.
Prerequisites: ART 120, ART 121

253 STUDIO PROBLEMS: SCULPTURE FALL 3 (0-6)
Advanced study in sculpture, with emphasis on improving individual directions in clay, plaster, metal, or wood.
Prerequisites: ART 212, ART 213

254 STUDIO PROBLEMS: WATERCOLOR
SPRING 2 (0-4)
Advanced study in watercolor to explore color and form according to individual interests.
Prerequisites: ART 105, ART 106

260 STUDIO PROBLEMS: DRAWING
FALL, SPRING 3 (0-6)
Advanced course in drawing. Exploration of different directions of expression through personal experimentation.
Prerequisites: ART 122, ART 123

BIOLOGY (BIOL)

BIOL 101 BIOLOGICAL SCIENCE
FALL, SPRING 4 (3-2)
Introduction to basic principles and concepts of biology as well as related laboratory experiences. Areas of emphasis include ecology, evolution, unity and diversity of life, molecular biology, genetics, cell biology, biotechnology and behavior. NOTE: Students with two (2) or more years of high school biology are recommended to take BIOL 111, BIOL 112, or BIOL 204.
Prerequisites: E, R, M

110 HUMAN ANATOMY & PHYSIOLOGY
FALL, SPRING FEE 4 (3-2)
A lecture and laboratory course designed for students interested in a health science program of study. Structure-function relationships of the eleven organ systems of the human body are emphasized at the cell, tissue, organ and system levels. NOTE: Students with one year of high school biology (with a C or better within the last 5 years) and one year of high school anatomy and physiology (with a C or better with the last 5 years) may be placed in BIOL 205 with Natural Science Chair approval.
Prerequisites: E, M, R

111 PRINCIPLES OF BIOLOGY I FALL 4 (3-3)
Emphasizes molecular biology, cell chemistry, cell structure and function, physiology, growth and development and genetics. For Biology majors and minors, or students planning to transfer to pre-professional programs requiring Biology. Includes a three-hour laboratory experience per week. NOTE: Students with two years of high school biology, or one year of high school biology and one year of chemistry will serve as BIOL 101 prerequisite.
Prerequisites: E, M, R, BIOL 101 (or recommend 2 yrs of high school biology, or one year of high school biology and one year of chemistry all with a grade of C or better)

112 PRINCIPLES OF BIOLOGY II SPRING 4 (3-3)
Emphasizes diversity of organisms, animal and plant structure, animal behavior and ecology. For Biology majors and minors, or those students planning to transfer to pre-professional programs requiring Biology. Includes a three-hour laboratory experience per week. Students with two years of high school biology, or one year of high school biology and one year of high school chemistry will serve as BIOL 101 prerequisite.
Prerequisites: E, M, R, BIOL 101 or BIOL 111

120 PLANT BIOLOGY SPRING FEE 4 (3-2)
A basic course in plant science designed to provide a practical understanding of plant morphology along with the processes involved in plant growth and development.
Prerequisites: E, M, R

170 LIFE SCIENCE FOR ELEMENTARY TEACHERS I
FALL 3 (2-3)
The first of a two course laboratory based biology sequence designed for prospective elementary school science teachers. This course is intended to acquaint students with the important concepts of biology and why it is important for children to learn biology and how to help them become independent and creative investigators of nature. This course will explore the practice of science rather than a body of revealed knowledge to be memorized. This course is specifically designed to transfer to Western Michigan University's Elementary Education program and may not transfer to other institutions.
Prerequisites: E, R, M and computer literacy

204 ENVIRONMENTAL BIOLOGY FALL 4 (3-3)
Study of basic concepts and applications of ecology as it relates to humans. Emphasis on basic ecological concepts and how they relate to current environmental problems. Laboratory work includes field and laboratory studies and field trips to areas of ecological and environmental interest.
Prerequisites: E, M, R, BIOL 101 or two years high school biology, or one year high school biology and one year in physical science

205 HUMAN ANATOMY
FALL, SPRING, SUMMER 4(3-2)
A lecture and laboratory course in which the human body is studied at the histological and gross levels of structure. Laboratory work includes organ dissection and the application of cadaver software and anatomical models illustrating the musculoskeletal, neuroendocrine, cardiopulmonary and urogenital systems. Out of class testing is required. Two years of high school biology with a C or better within the last 5 years may substitute for the biology prerequisite with instructor's permission.
Prerequisites: E, R, BIOL 101 or BIOL 108 or BIOL 110 or BIOL 111 or BIOL 112 with a grade of C or better

206 PRINCIPLES OF HUMAN PHYSIOLOGY
FALL, SPRING, SUMMER 4 (3-3)
A lecture and laboratory course covering the basic principles and concepts of human physiology. Online and classroom lectures are used to present core content. Computer simulations and hands-on laboratories are integrated with discussions and provide opportunity to apply basic physiological principles. Case studies are designed to help students make connections between knowledge of physiology and real-world situations. Testing outside scheduled class time required. Two years of high school math and 1 year of high school chemistry within the last 5 years may substitute for the chemistry prerequisite.
Prerequisites: E, M, R, BIOL 205 and CHEM 101 or CHEM 104 or PHSC 101 or CHEM 111 or CHEM 203 with a grade of C or better

210 MICROBIOLOGY FALL, SPRING 4 (3-3)
This is a basic microbiology course that introduces students to the principles of microbiology with an additional emphasis on health career applications. Instructor and student-led discussion sessions present the principles of microbiological morphology, physiology, reproduction and pathology, with special attention given to human disease. Laboratory exercises are integrated with discussion sessions and develop standard microbiology lab skills in the identification, culture, control and assay of microorganisms.
Prerequisites: E, M, R, BIOL 101 or BIOL 111, CHEM 101 or CHEM 104 or CHEM 111 all with a grade of C or better

212 GENETICS SPRING 4 (3-3)
This discussion based course (both instructor and student-led) includes the following sections: Mendelian genetics, DNA and chromosomes; gene transmission; linkage and recombination; genes and enzymes; the genetic code; mutations and variations; recombinant DNA; introduction to genomics; gene regulation; developmental, population, quantitative and evolutionary genetics. Lab experiences include statistical analysis, molecular techniques such as polymerase chain reaction (PCR) and gel electrophoresis, RNA interference in Caenorhabditis elegans and various computer exercises in bioinformatics.
Prerequisites: E, M, R, BIOL 101 or BIOL111 both with a grade of C or better

270 LIFE SCIENCE FOR ELEMENTARY TEACHER II
SPRING FEE 3 (2-3)
This is a laboratory-based course specifically designed for prospective elementary and middle school teachers. The objectives of the course are to aid students in developing meaningful and functional understanding of key biological concepts and their interrelationships; to provide students with open-ended problem solving environments that facilitate insight in the nature of science as an intellectual activity; to explore alternative conceptions of scientific phenomena; to help students develop more positive attitudes about science and increase their confidence in their ability to do science.
Prerequisites: E, M, R

BUSINESS ADMINISTRATION (BUSA)

100 BUSINESS MATHEMATICS
FALL, SPRING **3 (3-0)**
Fundamentals of addition, subtraction, division and multiplication with whole numbers, common fractions and percentages, and their application in business transactions.
Prerequisites: MATH 095 or a Group Ic course, with a C or better or associated placement test score

101 BUSINESS ACCOUNTING I
FALL, SPRING **3 (3-0)**
Accounting course for office workers, small-business accountants and owners, and those interested in the double-entry accounting system. Work includes development of basic principles underlying accounting procedures and discussion of techniques and records used in analyzing, classifying, recording, summarizing and reporting business transactions. Computers and other materials as appropriate will be utilized in the course.
Prerequisites: M, R

103 INTRODUCTION TO BUSINESS
FALL, SPRING **3 (3-0)**
Survey, orientation and background course acquaints students with role of business enterprise. Deals with various areas of business and is designed to help students decide their field of specialization.
Prerequisite: R

104 SALESMANSHIP **3 (3-0)**
Principles of sales-force organization, operation and selling techniques, with special emphasis given to personal selling and its part in marketing structure.
Prerequisites: E, M, R

105 PRINCIPLES OF RETAILING **3 (3-0)**
Overview of field of retailing, which covers types of institutions, store location, fixtures and equipment, store organization, and retail sales.
Prerequisites: E, M, R

108 SUPERVISORY SKILLS FALL, SPRING **3 (3-0)**
Fundamental skills of supervision and communication, focusing on the topics of performance standards, improvement and assessment, problem solving, and leadership.
Prerequisites: E, R

115 PRINCIPLES OF CUSTOMER SERVICE **3(3-0)**
Applies basic business knowledge and skills to develop customer-focused strategies necessary to maintain a competitive edge in the business world, with emphasis on fundamentals, skill-building and practical ideas to keep satisfied customers.
Prerequisite: BUSA 103

116 FUNDAMENTALS OF QUALITY CUSTOMER SERVICE **1 (1-0)**
Defines QCS, discusses importance, describes necessary infrastructure and helps students recognize moments of truth, to gain understanding of customer-focused company.
Prerequisite: BUSA 103

117 CUSTOMER COMMUNICATION **1 (1-0)**
Effective communication skills are the basis of customer service programs. Students learn active listening skills, assertive verbal communication and the impact of non-verbal language in this communication process as well as writing policies and procedures that support quality customer services.
Prerequisite: BUSA 103

118 SPECIAL CUSTOMER SERVICE SKILLS **1 (1-0)**
Elderly customers and customers with physical disabilities require sensitivity and special attention. Students learn how to overcome common feelings of awkwardness and the do's and don'ts in providing customer services.
Prerequisite: BUSA 103

150 JOB SEARCH SEMINAR FALL, SPRING **1 (1-0)**
Introduction to techniques of locating and obtaining employment. Includes practice letter- and resume-writing skills and discussion of interviewing skills, utilizing library and outside resources.
Prerequisites: E, R

151 MARKETING CAREER DEVELOPMENT **1 (1-0)**
Enhances the value of education in marketing, merchandising and management, which contributes to occupational competence. Promoting appreciation for responsibilities of citizenship in a free, competitive enterprise system. For students preparing for careers in management, sales, advertising, finance, retailing, wholesaling, insurance, real estate, fashion merchandising and other marketing-oriented occupations. Can be repeated up to four semester hours.
Corequisite: Membership in SIFE

200 INTRODUCTION TO ECONOMICS **3 (3-0)**
Introduction to Economics is a survey course that covers foundational principles of economics and their application in both macro and micro economic theory. The course focuses on gaining an understanding of how economic principles can be applied as a method of reasoning to analyze issues and problems faced by individuals, firms and society in the allocation of scarce resources. Microeconomic topics include the interaction of people and firms in the marketplace, including market structures and how individuals and firms make decisions. Macroeconomic topics include trade, inflation, unemployment, business cycles, growth, government spending, monetary and fiscal policy and taxation.
Prerequisites: MATH 128 or MATH 129 or MATH 130 or MATH 135 with a grade of C or better

201 PRINCIPLES OF ACCOUNTING I
FALL, SPRING, SUMMER **4 (4-1)**
Basic theoretical framework of accounting is presented to enable students to understand accounting principles and concepts as developed for sole proprietorship and partnership. Integration of microcomputers enables students to experience computers in accounting.
Prerequisites: E, M, R

202 PRINCIPLES OF ACCOUNTING II
FALL, SPRING, SUMMER 4 (4-1)
Continuation of BUSA 201. Emphasis on corporations' management controls and use of accounting data. Integration of microcomputers enables students to use computer accounting programs to generate financial statements and learn to interpret these statements as basis for business decisions.
Prerequisites: E, M, R, BUSA 201 in previous 3 years with C or better

203 PRINCIPLES OF ECONOMICS (MACRO)
FALL, SPRING, SUMMER 3 (3-0)
Emphasizes general principles of macroeconomics. Topics include supply and demand, inflation, unemployment, economic growth, business cycles, money, taxes, government spending, gross national product, price indexes, technology, wages, fiscal and monetary policy, interest rates, deficit and national debt, and international trade.
Prerequisites: E, M, R

204 PRINCIPLES OF ECONOMICS (MICRO)
FALL, SPRING, SUMMER 3 (3-0)
Emphasizes general principles of microeconomics. Topics include supply and demand, consumer behavior, cost theory, market structures, pricing factors of production, unions, poverty, government regulation and international trade.
Prerequisites: E, R, MATH 122 or MATH 128 or MATH 129 or MATH 130 or MATH 135 or MATH 151 or MATH 201 or MATH 202 or MATH 252 with a C or better

205 BUSINESS LAW I FALL, SPRING 3 (3-0)
Promotes understanding of laws covering business transactions encountered in everyday life and small businesses. Areas covered include simple contracts and negotiable instruments.
Prerequisites: E, R

206 BUSINESS LAW II SPRING 3 (3-0)
Basic legal matters pertaining to sales, real property and lease, and partnerships and corporations.
Prerequisites: E, R, BUSA 205 or permission of instructor

207 SMALL BUSINESS MANAGEMENT FALL 3 (3-0)
For small business managers and entrepreneurs. Analytical approach embodies sound basic principles of good management. Business functions of sales, production, procurement, personnel, finances and managerial functions of planning, organizing, actuating and controlling. Actual case problems related to small business management.
Prerequisites: E, R

207A ENTREPRENEURSHIP A FALL FEE 1 (1-0)
This course provides an examination of an individual's opportunity to achieve their entrepreneurial goals through understanding entrepreneurship and its relation to small business in the economy. Examination of business opportunities as they relate to small business success factors and their place within the local and global markets will be evaluated. The process of understanding and developing a business plan will be analyzed in respect to the goal of obtaining financial assistance. Types of business ownership will be studied as well as their place in the economy as determined by market analysis.
Prerequisites: E, M, R

207B ENTREPRENEURSHIP B FALL FEE 1 (1-0)
This course continues evaluating the entrepreneurial opportunities discussed in track A by exploring family business, franchising and business startup or purchase. Further development of the business plan including financial data and how it is delivered will be discussed. Continued examination of selection of organizational format and the management team will be included. The marketing plan will be refined so that the financial issues will be understood within the parameters of selection of funding sources and facilities location. Customer loyalty and product strategies such as pricing, promotion and distribution will be examined.
Prerequisites: E, M, R

207C ENTREPRENEURSHIP C FALL 1 (1-0)
This course continues evaluating the entrepreneurial opportunities discussed in tracks A & B by exploring the ethical issues faced by new business owners and their implications concerning success. Growth and its management will be examined regarding the aspects of human resources, information technology, quality and operations. This class will provide an analysis of assessing performance through financial evaluation, risk and asset management. Opportunities for the future including the sale of the business entity will be discussed.
Prerequisites: E, M, R

208 ADVERTISING AND SALES PROMOTION
SPRING 3 (3-0)
Analysis of principles and practices of advertising and promoting merchandise with the study of organization and sales practices within industry and business.
Prerequisites: E, M, R

209 PRINCIPLES OF MARKETING
FALL, SPRING, SUMMER 3 (3-0)
Analysis of the marketing task, with various essential functions performed in marketing and numerous and varied types of institutions performing the role of marketing.
Prerequisites: BUSA 215, BUSA 216 with a C or better

210 BUSINESS CORRESPONDENCE
FALL, SPRING, SUMMER 3 (3-0)
Principles of business letter writing. Provides an understanding of the components of written communications that influence people toward desired results such as: clear thinking, effective application of psychology and correct use of language.
Prerequisites: E, R

211 PRINCIPLES OF MANAGEMENT
FALL, SPRING, SUMMER 3 (3-0)
Principles of management and organization in modern business and industry; deals with standards, methods and problems in management.
Prerequisites: E, M, R

212 ACCOUNTING APPLICATIONS ON COMPUTERS
SPRING, ODD YEARS 3 (2-2)
Computer applications for accounting including general ledger, accounts receivable, accounts payable, depreciation and payroll, and spreadsheet accounting.
Prerequisites: E, M, R, CIS 108, BUSA 201 or BUSA 101, BUSA 202 or BUSA 102 (BUSA 202 or BUSA 102 may be taken concurrently with this class)

213 COST ACCOUNTING I SPRING 3 (3-0)
Fundamentals of cost accounting procedures including job cost principles and practices, with a basic course in manufacturing accounting and problem solving.
Prerequisites: E, M, R, BUSA 201, BUSA 202 in previous 3 years with C or better

214 COST ACCOUNTING II SPRING 3 (3-0)
Continuation of BUSA 213. Major topics include budgeting procedures, flexible budget, standard costs, gross profit analysis, direct costing, break even analysis, differential and comparative cost, capital budgeting and control, profit performance measurements, and linear programming.
Prerequisites: E, M, R, BUSA 201, BUSA 202, BUSA 213 in previous 3 years with C or better

215 BUSINESS COMMUNICATIONS
FALL, SPRING 3 (3-0)
Business success today depends on effective communication. It requires professionals to be thoughtful senders and receivers of information with customers, employees, regulators and managers around the globe. Business communication includes a spectrum of activity, from complex presentations to personal meetings and group email. This course focuses on how to approach communication strategically; students learn to write, speak and listen effectively for improved results. Students study communications from the perspective of both the sender and receiver - to more skillfully analyze a situation, adapt to the sender/receiver, and channel and communicate effectively. Students begin by exploring principles of communication before examining oral and written communication, visual aids, formed presentations and interviewing.
Prerequisites: ENGL 101, COMM 101, CIS 125 or OIS 114 with a C or better

216 BUSINESS STATISTICS
FALL, SPRING, SUMMER 3 (3-0)
Statistical decision-making is surveyed. The topics covered include: sampling techniques, tabular and graphical data, measures of central tendency and variability, simple probability, probability distributions (binomial, normal, t, chi-square and F), Central Limit Theorem, correlation and regression, estimation, hypothesis testing and analysis of variance.
Prerequisites: E, R, MATH 122 or MATH 123 or MATH 128 or MATH 129

218 INTERMEDIATE ACCOUNTING I FALL 3 (3-0)
Definition and valuation of current assets and liabilities, income measurements, balance sheet, cash flow, inventory valuation methods, plant assets, intangible assets and present-value methods.
Prerequisites: E, M, R, BUSA 201, BUSA 202 in previous 3 years with C or better

219 INTERMEDIATE ACCOUNTING II SPRING 3 (3-0)
Stockholder's equity, treasury stock, long-term liabilities, income tax allocation, investments, statement of cash flow, analysis of financial statements, price level changes, pension fund provisions and leases.
Prerequisites: E, M, R, BUSA 201, BUSA 202, BUSA 218 in previous 3 years with C or better

220 ORGANIZATIONAL BEHAVIOR
FALL, SPRING 3 (3-0)
This course provides an examination of individual, interpersonal, group and organization processes faced by employees. Current theory, research and practice regarding variables that influence human behavior are discussed. Emphasis is placed on learning relevant to goal setting, managing change, team processes, reward structures, human productivity and career management in organization settings.
Prerequisites: E, M, R

224 INCOME TAX ACCOUNTING FALL 3 (3-0)
Federal and state income tax laws as applied to individual, partnership and corporation returns.
Prerequisites: E, M, R, BUSA 201 in previous 3 years with C or better

225 PERSONNEL MANAGEMENT ON DEMAND 3 (3-0)
The organizational and administrative role of personnel in organizations and internal and external factors that influenced the evolution of personnel.
Prerequisites: E, M, R

261 DISTRIBUTIVE EDUCATION CO-OP I
FALL, SPRING FEE 3 (1-15)
Classroom and supervised on-the-job training in approved jobs obtained in retailing, wholesaling, marketing or service outlets. Includes classroom lectures, research and work experience in related business organization. Requires minimum 15 hours of work per week. Application must be placed with coordinator to participate in class.
Prerequisites: E, M, R, advanced standing for marketing and retailing majors, 2.00 GPA or higher in all previous college work, approval of Co-op Coordinator and signature of marketing program advisor

262 DISTRIBUTIVE EDUCATION CO-OP II
SPRING FEE 3 (1-15)
For those students who successfully complete BUSA 261. Requires minimum 15 hours of work per week. Application must be placed with coordinator to participate in class.
Prerequisites: E, M, R, BUSA 261 or equivalent

263 MANAGEMENT TRAINEE CO-OP I
FALL, SPRING FEE 3 (1-15)
Classroom and cooperative training includes supervised, on-the-job managerial experience in business and industry. Requires minimum 15 hours of work per week. Application must be placed with coordinator to participate in class.
Prerequisites: E, M, R, advanced standing in management trainee program, 2.00 GPA or higher in all previous college work, approval of Co-op Coordinator and signature of Management Program Advisor

264 MANAGEMENT TRAINEE CO-OP II
SPRING FEE 3 (1-15)
For students who successfully complete BUSA 263. Requires minimum 15 hours of work per week. Application must be placed with coordinator to participate in class.
Prerequisites: E, M, R, BUSA 263 or equivalent, approval of Co-op Coordinator and signature of management program advisor

265 ACCOUNTING CO-OP I
FALL, SPRING FEE 3 (1-15)
Students work in approved accounting position to gain on-the-job training. Requires minimum 15 hours of work per week. Each student meets one hour per week with advisor in related class.
Prerequisites: E, M, R, completion of all first year courses in Accounting program with minimum GPA of 2.00, approval of Co-op Coordinator and signatures of Accounting Program Advisor and on other full-time Business Administration instructor

266 ACCOUNTING CO-OP II
SPRING FEE 3 (1-15)
For students who successfully complete BUSA 265, requires minimum 15 hours of work per week. Application must be placed with coordinator to participate in class.
Prerequisites: E, M, R, BUSA 265, approval of Co-op Coordinator and signatures of Accounting program coordinator and one other full-time Business Administration instructor

CREDIT FOR EXPERIENTIAL LEARNING (CAEL)

150 CREDIT FOR EXPERIENTIAL LEARNING PORTFOLIO
FALL, SPRING, SUMMER FEE 1 (1-0)
This course is designed to provide an expedited introduction and overview to Prior Learning Assessment (PLA) portfolio development. This course will utilize readings, structured activities and procedural documentation to help students demonstrate comprehension and appreciation of life/work experiences and how those relate to acquire learning. Upon completion of the course, students will be able to submit a final portfolio for college credit evaluation based on the work completed throughout the course. A grade of C or better in this course is necessary to submit portfolio for additional course credit. This course is offered in collaboration with the Credit for Adult and Experiential Learning.
Prerequisites: ENGL 101, Approval from lead instructor or Department Chair

CHEMISTRY (CHEM)

101 INTRODUCTORY CHEMISTRY I
FALL, SPRING, SUMMER 4 (3-3)
For students with little or no background in chemistry. Concepts of energy and matter; properties of gases, liquids and solids; structure of atoms; periodic table; chemical bonds; formulas and equations; stoichiometry; and solutions. Laboratory includes introduction to qualitative analysis. Credits apply toward Associate Degree. May transfer for science credit but usually not as General Chemistry (depends on specific school and program).
Prerequisites: E, R, M, (or one year of high school algebra, with C or better)

104 FUNDAMENTALS OF GENERAL, ORGANIC AND BIOCHEMISTRY FALL, SPRING, SUMMER 4 (3-3)
Intense introductory course that integrates topics from general, organic and biochemistry and is geared toward Allied Health students. Measurements, conversions, atomic structure, bonding, states of matter, chemical reactions, stoichiometry, gas laws, acid/base chemistry, nuclear chemistry, functional groups, organic/biochem structures, isomers, nomenclature, enzymatic activity and basic biochemical/metabolism reactions are all topics covered. Includes integrated laboratory experiences. Out-of-class assessment is part of the course.
Prerequisites: E, R, MATH 095/125 or pass algebra proficiency test

111 GENERAL CHEMISTRY I FALL FEE 4 (3-3)
The first course in a two-term sequence of General Chemistry. Fundamental principles of chemistry are explored, including elements and compounds, naming, chemical bonding, reaction types, stoichiometry, thermochemistry, solution chemistry, gas laws, acid-base chemistry and molecular geometry. Integrated laboratory exercises reinforce concepts. One (1) year high school chemistry, can serve as the chemistry prerequisite with permission of the instructor.
Prerequisites: E, R, MATH 122 OR (MATH 200 and MATH 210 and MATH 265), CHEM 101 with a grade of C or better or CHEM 104 all with a grade of C or better

112 GENERAL CHEMISTRY II FALL FEE 4 (3-3)
The second course in a two term sequence of General Chemistry. Topics include chemical kinetics, equilibrium chemistry, acid-base, pH, buffers, titrations, thermodynamics, redox and electrochemistry, nuclear chemistry, basic organic structure and biological molecules. Integrated laboratory exercises reinforce concepts.
Prerequisites: E, R, MATH 122, CHEM 111 with a grade of C or better

203 ORGANIC CHEMISTRY I FALL 4 (3-3)
Chemistry of compounds of carbon. Meets requirements for majors in chemistry, biological science, chemical engineering and health science. Includes nomenclature, structure, isomerism, synthesis, functional groups and mechanisms. Problems and laboratory work for each unit.
Prerequisites: E, M, R, CHEM 112 or CHEM 102 with consent of instructor

204 ORGANIC CHEMISTRY II SPRING 4 (3-3)
Continuation of CHEM 203. Includes additional functional groups and mechanisms plus introduction to biochemistry. Laboratory includes qualitative analysis and use of infrared spectrometer, gas chromatograph, polarimeter, and refractometer.
Prerequisites: E, M, R, CHEM 203

COLLEGE LIFE STUDIES (CLS)

100 COLLEGE & CAREER SUCCESS
FALL, SPRING, SUMMER 1(1-0)
Designed to increase student success by offering a comprehensive orientation to the Lake Michigan College experience. Students will be introduced to college web-based resources and services including Wavelink and Canvas, technology-based program planning and transfer information, and library research databases. Additional topics include career/major decision-making, understanding college expectations, time management, effective study and learning strategies, and living and working in a diverse global society.

102 COLLEGE LEARNING AND SUCCESS STRATEGIES
SUMMER 2(2-0)
An introduction to student success strategies designed to equip students with the information, resources and experiences necessary to be prepared for college. This class will include an overview of college level expectations with a focus on preparation for successful academic and transitional outcomes.

103 HIGHER LEARNING STRATEGIES
FALL, SPRING 3(3-0)
An introduction to learning strategies designed to increase student success by offering an applied approach for increased comprehension and retention of course content. This class will focus on developing inquiry-based skills through application to current and future course work.

104 APPLIED LEARNING STRATEGIES
FALL, SPRING 1(1-0)
This course will help students apply the learning strategies from CLS103 to both current and future coursework. Instructional support and application scenarios will be practiced for all applicable course content areas.
Co-requisite: CLS 103

110 CAREER DECISION MAKING
FALL, SPRING 2(2-0)
Realistic career decision making and planning important to any stage of life. Students learn career paths most appropriate now and in the future. Students examine resources, values and abilities through testing and computerized search processes. Students identify three to five career opportunities appropriate to aptitude and skills. Not intended for transfer.

114 FUNDAMENTALS FOR SUCCESS SUMMER 3(3-0)
Apply physiological, social and psychological principles to success in college, the world of work and life. Explore personality, interests and values to increase self-understanding and select an appropriate major and career. Learn about careers of the future. Discover strategies for lifelong learning by identifying your learning style and applying psychological principles of learning and memory to academic study strategies. Apply life management techniques such as time and money management to accomplish personal goals. Examine adult stages of development and develop a plan for wellness and living a long and healthy life. Learn strategies for motivation and stress management. Practice creative and critical thinking techniques.

216 STRESS MANAGEMENT FALL, SPRING 2 (2-0)
This course assists the student in understanding the physiological responses to stress and assists in developing techniques for better stress management.

217 SELF ESTEEM FALL, SPRING 1 (1-0)
Assists in growth in ability to love and care for oneself and others. Techniques practiced daily to enhance self-esteem and a variety of self-esteem issues is presented.

COMMUNICATION (COMM)

101 INTRODUCTION TO PUBLIC SPEAKING
FALL, SPRING 3 (3-0)
Beginning course in public speaking dealing with application of basic principles and practices of effective speaking. Coursework includes oral presentations and practical applications of speech communication theory.
Prerequisites: E, R

COMPUTER INFORMATION SYSTEMS (CIS)

100 FOUNDATIONS OF INFORMATION TECHNOLOGY
FALL, SPRING, SUMMER FEE 3 (3-0)
This survey course is a general introduction to computers and information technology and is designed to provide computer literacy in the digital age. A broad range of topics is covered, including hardware, software, the networking of computer systems, the internet, e-commerce, information security and careers available in the industry. Topics will also include different types of information systems, database design and administration, systems analysis and the use of programming languages in software development.

106 OPERATING SYSTEM FOUNDATIONS
FALL, SPRING, SUMMER FEE 3 (3-0)
This course is a survey of current operating systems. Topic coverage will include the newest versions of Windows, Linux, Mac OS and Android, as well as basics in computer security, wireless and cloud computing.

108 OFFICE INFORMATION SYSTEMS
FALL, SPRING, SUMMER FEE 3 (3-0)
Students will learn the most common applications for Word, Excel, Access and PowerPoint used in business and industry. While developing a foundational fluency in Microsoft Office, this course will introduce and teach students how to solve the most common word processing, spreadsheet, presentation and database problems. This is the first course in a two-course sequence aligned with Microsoft Office Specialist (MOS) certification.

111 DATABASE SYSTEMS FALL FEE 3 (3-0)
This course introduces the basics of database management and the SQL language by implementing simple databases. Tasks include creating, querying, sorting, indexing and manipulating a database file and generating reports and labels. Normalization techniques will also be introduced. Students will create custom screens and work with multiple database files, forms and report structures to demonstrate understanding of the knowledge and skills acquired in this course. Commercial software will be used. This course prepares students for industry certification exam(s).
Prerequisites: E, M, R

118 WEB DEVELOPMENT & DESIGN FOUNDATIONS
FALL, SPRING FEE 3 (3-0)
This class introduces students to the wide range of concepts and technologies related to the web development and design process. Topics include discussion and demonstration of multimedia and web technologies, site functionality, web development languages (such as HTML, CSS and PHP), internet ethics, security, networking, marketing and management. Students will use commercial development tools.

119 PROGRAMMING LOGIC & DESIGN
FALL, SPRING FEE 3 (3-0)
This is an introductory course in computer programming logic. The student will learn concepts applicable to all programming languages. Topics include data types, arrays, logic control structures, algorithms, structured programming methods, report generation, memory addressing schemes, functions and modules. Program logic will be developed using flowcharts and pseudocode.

140 NETWORK FOUNDATIONS
FALL, SPRING FEE 3 (2-2)
This course covers basic computer networking terminology, topologies, systems, protocols, devices and management. Course content is updated regularly to reflect current topics in computer networking. Typical topics include: IP (including subnetting) and data link network access layer addressing, encapsulation, basic networking device operation and function, basic network troubleshooting skills and basic network device configuration. Aligned with industry certifications.

155 COMPARATIVE OPERATING SYSTEMS
FALL FEE 3 (2-2)
This course is designed for students wishing to develop an understanding of current operation systems, their differences and similarities, user interfaces and application considerations. Students will develop a proficiency installing current operating systems. They will also use the command line (shell), access and change BIOS, system and administrative tools.
Prerequisites: CIS 106

156 COMPUTER SECURITY
FALL, SPRING FEE 3 (2-2)
The purpose of this course is to provide students with a comprehensive overview of computer and network security issues including the numerous types of attacks to which computers are vulnerable; the types of attacker profiles; education, training and awareness regarding computer/network use; and the hardware and software defense solutions available. It covers topics from configuring personal virus detection to the function/operation of firewalls, VPNs, access control lists, etc. Students will gain an appreciation and better understanding of the terms, devices and software employed in securing computers and networks in homes, small businesses and large businesses. Aligned with CompTIA Security+ certification.

158 GEOSPATIAL TECHNOLOGIES
FALL, SPRING, SUMMER FEE 3 (3-0)
This survey course is designed to introduce several aspects of geospatial technologies. Topics include cartography and map design, geospatial data and GPS, geographic information systems (GIS), remote sensing (RS) and geospatial applications. This course will provide hands-on experience and a solid foundation that leads to more specialized courses leading to a CIS degree in GIS. Home computer access recommended.

164 C++ PROGRAMMING
FALL, SUMMER FEE 3 (3-0)
This course introduces the fundamental concepts and implementations of a modern C programming language in a business environment. Major topics include general programming tools for business applications and fundamentals of business programming such as language syntax, declaration and data types, variables and constants, arrays, statements and expressions, conditions, programming structures (i.e. sequence, selection, iteration) and modularity of business applications. Commercial development tools will be used.
Prerequisite: CIS 119

170 UNIX/LINUX OPERATING SYSTEMS
SPRING FEE 3 (3-0)
An introductory course that will introduce students to the basic concepts of the UNIX/Linux operating system. Topics include essential UNIX/Linux commands, login and logout sequences, setting passwords, e-mail, fundamentals of the vi editor, piping and redirection, security and process control, the Kernel, file system, shell programming, X windows and basic system administration. Shell scripts will also be covered. This course is aligned with Linux+ / LPIC 1 certification.
Prerequisite: CIS 106

200 IT SUPPORT FALL, SPRING FEE 3 (2-2)
This course covers personal computer system operation, maintenance and repair. Various hardware components will be examined in detail. Installation, configuration and troubleshooting will be performed. In addition, Microsoft operating systems will be covered from a PC repair technician perspective. Topics include how the operating system interacts with the PC's hardware, the boot process, troubleshooting and interaction with application software. The student will experience hands-on interactive labs with actual hardware as well as various operating systems and application installations. This course covers the hardware and software concepts necessary for CompTIA A+ certification.

202 DATA REPORTING & ANALYSIS
FALL, SPRING **FEE 3 (3-0)**
This course is designed to give students comprehensive skills and in-depth knowledge to plan, design and deliver business reports that will help management analyze and interpret complex business information. Business report solutions that range from personal productivity software to full-scale reporting systems will be covered.

208 INTERMEDIATE OFFICE INFORMATION SYSTEMS
SPRING **FEE 3 (3-0)**
This course is a continuation of CIS 108 with advanced experience in office productivity software. Intermediate-level concepts and exercises in word processing, spreadsheets, databases and presentation graphics, with emphasis on advanced use of application software in a business environment. This is the second course in a two-course sequence aligned with Microsoft Office Specialist (MOS) certification.
Prerequisite: CIS 108

219 CLIENT-SIDE WEB DEVELOPMENT
FALL, SPRING **FEE 3 (2-2)**
This is a skill-based course to help students refine the techniques and functionality introduced in the foundations course. Advanced topics will be covered, particularly the use of multimedia and responsive design, to create professional web pages. Advanced software tools will be used. This course is aligned with industry certification.
Prerequisite: CIS 118

220 WEB PROGRAMMING
FALL, SPRING **FEE 3 (2-2)**
This course teaches dynamic web page development with JavaScript through detailed lectures and hands-on laboratory assignments. Students design, code, test and debug web-based applications. The components of web page development and the basic aspects of web page creation, utilizing commonly used HTML5 elements and CSS3 properties are covered, as well as advanced topics including object-oriented programming, the Document Object Model (DOM), touch and mobile interfaces and Ajax. After completing this course, students will be able to use JavaScript to build professional quality web applications.
Prerequisites: CIS 118 and CIS 119

221 SERVER-SIDE SCRIPTING FALL **FEE 3 (2-2)**
Server based scripting languages are used to develop powerful applications. Database applications using current scripting languages will be discussed and used. Advanced software tools will be used. This course leads to industry certification.
Prerequisites: CIS 118 and CIS 119

226 ROUTING & SWITCHING
SPRING, SUMMER **FEE 3 (2-2)**
This course covers LAN technologies and operation, WAN devices, explaining and selecting appropriate administrative tasks required for WLANs, identifying security threats and methods to mitigate them, implementing small routed networks, small switched networks, being able to implement and verify WAN links, implementing an IP addressing scheme and IP services to meet network requirements for a small branch office, subnetting, routed and routing protocols, and components of and boot sequence of a Cisco router. Students will configure routers and routing protocols and switches. Aligned with Cisco CCENT Exam.
Prerequisites: E, M, R, CIS 140

227 CONNECTING NETWORKS FALL **FEE 3 (2-2)**
This course covers LAN technologies, WAN protocols, VLSM, bridging, switching and routing protocols. Students will configure routers and switches, including VLANs with trunking and ACLs as required by the Cisco CCNA exam. See cisco.com - certifications for specific topics. Aligned with Cisco CCNA certification.
Prerequisite: CIS 226

228 SCALING NETWORKS FALL **FEE 3 (2-2)**
This course is the capstone course for the CIS Networking program. It will focus on security of networks that include a minimum of switches, routers and servers and how to secure these devices. An introduction of wireless networking and some of the more complex topics of computer networking, including scaling networks, LAN redundancy, link aggregation, OSPF routing, etc., will be covered. Students will securely configure switches, routers and routing protocols and devices such as VPNs, switches and firewalls.
Prerequisite: CIS 226

237 GEOGRAPHIC INFORMATION SYSTEMS
FALL, SPRING **FEE 3 (2-2)**
This course introduces the basic principles and application of geographic information systems (GIS), map design and interpretation and the nature and use of spatial data. Students gain hands-on experience in the various uses of geographic information and the methods for collection, management, exploration, analysis and presentation of vector and raster data. Mainstream commercial software will be used.
Prerequisite: CIS 158

238 REMOTE SENSING
FALL, SPRING **FEE 3 (2-2)**
This course introduces concepts and procedures used in aerial and satellite image processing. Topics covered include sensor properties, image analysis and classification, image transformations and enhancement, applications and integration with GIS. Students will utilize commercial image software to perform basic image manipulation, analysis and display.
Prerequisite: CIS 158

239 FIELD METHODS IN GIS
FALL, SUMMER **FEE 3 (2-2)**
This course introduces concepts and techniques of field mapping and data collection using Global Positioning Systems (GPS) and Mobile GIS, including a detailed study of the technology and applications of GPS. Lab exercises require fieldwork and teamwork. Instruction will include the fundamentals of operating a hand-held GPS unit. Students will utilize pre-planning, field and post-processing procedures to create GIS data. Methods for maximizing data quality and accuracy will be emphasized. Commercial hardware and software will be used.
Prerequisites: CIS 158

240 SYSTEMS ANALYSIS & DESIGN
SPRING FEE 3 (3-0)
Understand the process of developing information systems that effectively use hardware, software, data, processes and people to support the company's business objectives.
Prerequisites: CIS 100, CIS 119 and CIS 140

242 WINDOWS SERVER SPRING FEE 3 (2-2)
This course covers the fundamentals of Windows server technologies and many of the objectives required for the most current Microsoft Server Certification Exams 70-410 thru 70-412. Hands-on labs supplement the classroom activities. Aligned with Microsoft MCSA certification.
Prerequisites: CIS 140, CIS 155

250 SELECTED TOPICS IN CIS
ON DEMAND FEE 3 (3-0)
Information Technology is a dynamic, rapidly changing field. This course is designed to explore current trends and topics in Computer Information Systems. Topics and prerequisites will vary. Students can repeat this course when different topics are offered. This course may be used to fulfill CIS degree program requirements.

255 STRUCTURED QUERY LANGUAGE
SPRING FEE 3 (3-0)
Structured Query Language (SQL) is standard language for query databases. Most database tools offer varying menus and functions and share a common underlying SQL engine interface. Experience creating and running independent databases in SQL. Commercial software will be used. This course is aligned with industry certification.
Prerequisite: CIS 111

261 COMPUTER INFORMATION SYSTEMS CO-OP I
FALL, SPRING 3 (1-15)
This course integrates a student's academic studies with work experience in an approved data processing job that the student has obtained and in which the student earns credits for satisfactory data processing experience. A minimum of 15 hours per week is required. Each student meets one hour per week with the coordinator in a related class. To participate in the class, application must be placed with the coordinator.
Prerequisites: advanced standing in the data processing program, a 2.00 GPA or higher in all previous college work and approval of the co-op coordinator, the Computer Information Systems program coordinator and one of the full-time Business Administration faculty; E, M, R

262 COMPUTER INFORMATION SYSTEMS CO-OP II
SPRING 3 (1-15)
This is an elective course for those students who have successfully completed CIS 261. A minimum of 15 hours of work per week is required. Each student meets one hour per week with the coordinator in a related class. To participate in the class, application must be placed with the coordinator.
Prerequisites: E, M, R, CIS 261 and approval of the co-op coordinator

264 ADVANCED C++ PROGRAMMING
FALL FEE 3 (3-0)
This course is a continuation of CIS164 with more emphasis on top-down, modular, structured design and techniques involved in the production of large computer programs. Advanced language features such as web application, database, file access, object-oriented programming, graphics and animation are covered. A team programming project will be assigned.
Prerequisite: CIS 164

266 JAVA PROGRAMMING FALL FEE 3 (3-0)
An intermediate course that introduces the Java programming language and object oriented programming. Topics will include control statements and methods, arrays, inheritance, string handling, graphics generation, file input/output and multi-threading. Students will design, code, test and debug several Java applets using objects in the standard Java libraries.
Prerequisite: CIS 164

268 C# PROGRAMMING SPRING FEE 3 (3-0)
An advanced course for students who have a basic understanding of arrays, pointers, structures and object oriented programming. The goal of this course is to provide students with the knowledge and skills they need to develop C# applications for the Microsoft .NET Platform. The course focuses on C# program structure, language syntax and implementation details. Commercial development tools will be used.
Prerequisite: CIS 264

277 ADVANCED GIS APPLICATIONS
FALL, SPRING FEE 3 (2-2)
This course explores the practice of using a geographic information system (GIS) to perform advanced geoprocessing to solve spatial problems and support decision making. Topics include a review of underlying geographic concepts (coordinate systems and projections), map design and outputs, geodatabases, importing spatial and attribute data, geocoding, spatial data processing and advanced spatial analysis. Additional topics include map algebra, modeling, geostatistical and network analysis, and 3D display. Students will be able to customize their lab exercises by choosing projects using real-world data taken from several disciplines. Students will follow a structured workflow using commercial GIS software to examine data, develop process summary, perform analyses, create maps and write reports that communicate results successfully to a broad audience.
Prerequisite: CIS 237

278 WEB GIS/GEODATABASE DESIGN
FALL, SPRING FEE 3 (2-2)
Introduction to the fundamental concepts underlying the geodatabase, the various approaches for representing and managing geographic information and how geodatabases are used in cloud and server GIS applications. Students will survey database models, spatial data and spatial database systems. Topics include vector modeling and topography, linear modeling and referencing, geocoding, cell modeling, surface modeling, temporal modeling and multiuser geodatabase editing. Students will also be introduced to Web GIS system architecture, geospatial web services, mashups, customized web-based mapping applications, Mobile GIS and the development of distributed web services for GIS. Integrated lab exercises offer an opportunity to gain hands-on experience using commercial GIS software to plan, create and implement a Web GIS application.
Prerequisite: CIS 237

279 GIS CUSTOMIZATION & PROGRAMMING
FALL, SPRING FEE 3 (2-2)
Introduces design, coding and implementation of GIS-based software and models to GIS users who have no prior programming experience. Covers the fundamentals of geoprocessing, ModelBuilder and the Python language. Students will learn how to write scripts that work with spatial data, run tools in Python and automate tasks in ArcGIS. Topics include map scripting, debugging and error handling, and the creation of Python functions and object classes. Integrated lab exercises offer an opportunity to gain hands-on experience using commercial GIS software to process real-world data. Students will conceptualize, plan, implement and document the results of GIS mapping applications, customizations, automations and extensions.
Prerequisite: CIS 237

291 SOFTWARE ENGINEERING
SPRING FEE 3 (2-2)
Advanced course covering topics in software design and implementation, including development paradigms, project requirements and specifications, object-oriented development, graphical user interface (GUI) design, event-driven systems, CASE tools, and the maintenance and management of systems software. UML will be used to model the phases of the software engineering process and exercises will emphasize a hands-on approach to object-oriented software development.
Prerequisite: CIS 264 or CIS 266

295 PROJECT MANAGEMENT
SPRING 3 (3-0)
Students will understand the genesis of project management; its concepts, skills, tools and techniques; and its importance to improving the success of information technology projects.
Prerequisites: E, M, R, CIS 108 or CIS 208

CORRECTIONS, PROBATION AND PAROLE (CORR)

160 INTRODUCTION TO CORRECTIONS FALL 3 (3-0)
Provides understanding of correctional systems. Topics include history and philosophical development of corrections, legal process, probation, imprisonment and parole, rights of prisoners and community-based corrections. Related responsibilities and vocational opportunities examined. NOTE: To qualify for corrections Officer Academic Certificate, students must achieve at least a C (2.0) in the course.
Prerequisites: E, R

161 INSTITUTIONAL OPERATIONS FALL 3 (3-0)
Introductory study of correctional institutions and role in criminal justice process and society. Course includes, but is not limited to, study and discussion of correctional institutions, history, purpose, objectives, study of types of institutions, correctional programs, institutional problems, security procedures, correction and criminal law, management techniques, alternatives to institutionalization and correctional planning. NOTE: To qualify for corrections Officer Academic Certificate, a student must achieve at lease a C (2.0) in the course.
Prerequisites: E, R

162 INSTITUTIONAL POPULATIONS SPRING 3 (3-0)
Basic principles of human and criminal behavior and the role of biological, psychological, environmental and social influences in the development of normal and criminal personalities and individual and group techniques for changing attitudes. Institutionalization and controlled community alternatives to institutionalization are evaluated. NOTE: To qualify for Corrections Officer Academic Certificate, a student must achieve at lease a C (2.0) in the course.
Prerequisites: E, R

163 CONCEPTS OF REHABILITATION FALL 3 (3-0)
The meaning and function of culture in relationships, minorities and impact of discrimination, attitude formation and professional responses to human behavior. Current theory and practices in rehabilitation in federal, state and municipal systems are discussed. Emphasis on the state program. NOTE: To qualify for Corrections Officer Academic Certificate, a student must achieve at lease a C (2.0) in the course.
Prerequisites: E, R

164 LEGAL ISSUES IN CORRECTIONS SPRING 3 (3-0)
Explores legal issues in corrections. Topics include constitutional law, law and court process, U.S. and State courts and court cases, Section 42, and prisoner's rights. Cases and statutes read and analyzed for impact on corrections. The role of corrections officers in complying with law is discussed. NOTE: To qualify for Corrections Officer Academic Certificate, a student must achieve at least a C (2.0) in the course.
Prerequisites: E, R

264 CASE STUDIES IN REHABILITATION
SPRING 3 (3-0)
Modern trends in corrections, such as community-based programs in work-release, halfway houses and contract program planning. Therapeutic community and treatment team concept in institutions described and evaluated. Problems of correctional programming for short-term offender, special emphasis on alcoholism, drug abuse and narcotic problems, prostitution, homeless persons and related problems.
Prerequisites: E, R, sophomore standing in Corrections, Probation and Parole

DANCE (DANC)

101 BEGINNING BALLET 1(1-0)
Basics of classical ballet training. Includes terminology, body positions, movement vocabulary and principles of body alignment. May be repeated for a maximum of four credit hours.

102 BEGINNING JAZZ 1(1-0)
Jazz dance and its technique, history and relationship to the fine and performing arts. Includes dance combinations, improvisations and strength and flexibility exercises as well as lectures and video. May be repeated for a maximum of four credit hours.

DENTAL ASSISTING (DENT)

165 INTRODUCTION TO DENTAL ASSISTING
FALL, SPRING, SUMMER 3 (2-2)
Introductory course to dental assisting. Topics include dental teamwork, use of language, listening skills and personal oral hygiene.
Prerequisites: E, R, acceptance into Dental Assisting Program or permission of Dental Assisting Director. Transitional studies courses can be taken concurrently.

166 CHAIRSIDE I
FALL, SPRING, SUMMER 3 (2-2)
Introductory course in concepts of four-handed dentistry. Basic dental equipment, instrument identification, sterilization procedures, medical records history, infection control and vital signs presented.
Prerequisites: E, R, DENT 165 or permission of Dental Assisting Director. Transitional studies courses cannot be taken concurrently.

167 CHAIRSIDE II FALL, SPRING, SUMMER 3 (2-2)
Continuation of DENT166; includes identification of handpieces, proper mixing of dental materials, precautions in use of nitrous oxide, and assisting with topical and local anesthetics.
Prerequisites: E, R, DENT 165, DENT 166 or permission of Dental Assisting Director

168 CHAIRSIDE III FALL, SPRING, SUMMER 3 (2-2)
Continuation of DENT167, Chairside II. Topics addressed include performing chairside functions, fabricating custom trays, preparing final impressions, taking bite registrations, pouring and trimming study model, and use of various types of orthodontic appliances.
Prerequisites: E, R, DENT 167 or permission of Dental Assisting Director

169 CHAIRSIDE IV FALL, SPRING, SUMMER 3(2-2)
Introduces the dental assistant's role in oral surgery, endodontics and pediatric dentistry.
Prerequisites: E, R, DENT 168 or permission of Dental Assisting Director

170 INTRODUCTION TO DENTAL OFFICE ASSISTING
FALL, SPRING, SUMMER FEE 2 (2-0)
Duties of dental office assisting including appointment maintenance, dental material inventory control, processing insurance forms and preparing professional written communications. Students may also register with permission of Director of Dental Assisting.
Prerequisites: E, R, DENT 169

171 INTRODUCTION TO DENTAL RADIOGRAPHY
FALL, SPRING, SUMMER FEE 3 (2-2)
Study of the use of x-radiation in dentistry, processing and mounting radiographs, exposure of dental radiographs, radiation dosage and hazards. Protective measures for patient and operator stressed. Students must be 18 years of age or older to enroll in course. Permission of Director of Dental Assisting required.
Prerequisites: DENT 170

172 MEDICAL ISSUES IN THE DENTAL OFFICE
FALL, SPRING, SUMMER 2 (2-0)
Medical and dental emergencies and drugs encountered in treatment of dental patients.
Prerequisites: E, R, DENT 170 or permission of Dental Assisting Director

173 CLINICAL I
FALL, SPRING, SUMMER 6 (1-15)
Students assigned in community dental offices for clinical experiences. Includes review for Dental Assisting National Board examination and professional activities. Weekly seminar held with college instructor.
Prerequisites: E, R, DENT 169, DENT 171 and DENT 172

174 REGISTERED DENTAL ASSISTANT I
FALL, SPRING, SUMMER 3 (2-2)
Advanced functions of Michigan Registered Dental Assistant including placement and removal of temporaries and rubber dams. Students study state and national guidelines in infection control, hazard communication and waste disposal.
Prerequisites: E, R, successful completion and/or current enrollment in DENT 173 or permission of Dental Assisting Director

175 REGISTERED DENTAL ASSISTANT II
FALL, SPRING, SUMMER 3 (2-2)
Continuation of RDA I includes advanced charting, extraoral and intraoral examination, suture removal and application of periodontal dressing, topical fluoride, and pit and fissure sealants. Ethics and jurisprudence presented. Simulated RDA written and clinical board given at end of course.
Prerequisites: E, R, DENT 174 or permission of Dental Assisting Director

176 CLINICAL II FALL, SPRING, SUMMER 5 (1-12)
Students assigned to community dental offices for clinical experience in expanded functions. Weekly seminar held with college instructor.
Prerequisites: E, R, successful completion of all dental assisting courses

180 DENTAL RADIOGRAPHY
FALL, SPRING, SUMMER FEE 2 (1-2)
Application of skills and radiographic principles developed in DENT 171 by exposing radiographs on patients with emphasis on patient management and film placement techniques.
Prerequisites: DENT 171

DIAGNOSTIC MEDICAL SONOGRAPHY (DMSO)

100 INTRODUCTION TO DIAGNOSTIC MEDICAL SONOGRAPHY 3 (3-0)
Introduction to the physical and mathematical principles of ultrasonography. Review of: historical background; basic patient care skills; legal documentation; ethical principles and personal workplace safety.
Prerequisites: E, M, R, Entrance into the program.

101 GENERAL SONOGRAPHY I ABDOMEN 4 (4-0)
This course provides the student with abdominal sonographic cross sectional anatomy and pathology demonstrated in the transverse, longitudinal and coronal planes.
Prerequisites: E, M, R, DMSO 100

102 GENERAL SONOGRAPHY I OB/GYN FALL 4 (4-0)
Introduction to: fetal and maternal cross-sectional anatomy and pathology; biological effects of fetal ultrasonography, prenatal diagnoses and syndromes.
Prerequisites: E, M, R, DMSO 100

103 SONOGRAPHY LAB APPLICATIONS I FALL 3 (0-6)
This course provides the student with lab applications in general abdominal and OB GYN sonographic cross sectional anatomy and pathology demonstrated in the transverse, longitudinal and coronal planes.
Prerequisites: E, M, R, DMSO 100

104 CLINICAL EXPERIENCE A FALL 2 (0-16)
The first in a five semester sequence of scanning applications and techniques, for imaging related to abdomen, pelvic, small parts and gravid uterus.
Prerequisites: E, M, R, DMSO 100

200 GENERAL SONOGRAPHY II ABDOMEN SPRING 3 (3-0)
Intermediate to advanced identification and interpretation of anatomy and pathology of the abdomen, venous system and small parts. Emphasis will be on abnormal anatomy/pathology with hepatic and renal transplant.
Prerequisites: E, M, R, DMSO 100, DMSO 101, DMSO 102, DMSO 103, DMSO 104

201 GENERAL SONOGRAPHY II OB/GYN SPRING 3 (3-0)
A continuation of DMSO 102. Intermediate to advanced identification of an interpretation of cross sectional anatomy and pathology of the female pelvis and fetal and placental development.
Prerequisites: E, M, R, DMSO 101, DMSO 102, DMSO 103, DMSO 104

202 SONOGRAPHY LAB APPLICATIONS II SPRING 3 (0-6)
A continuation of DMSO 103, with lab applications in general abdominal, small parts and OB/GYN sonographic cross sectional anatomy and pathology demonstrated in the transverse, longitudinal and coronal planes.
Prerequisites: E, M, R, DMSO 101, DMSO 102, DMSO 103, DMSO 104

203 SONOGRAPHIC PHYSICS I SPRING 3 (3-0)
The fundamental principles of acoustical physics; how sound is produced, manipulated and reacts with various mediums. Discussion and mathematical problem solving will be stressed in this course.
Prerequisites: E, M, R, DMSO 101, DMSO 102, DMSO 103, DMSO 104

204 CLINICAL EXPERIENCE B SPRING 2 (0-2)
Second in a five-semester sequence of clinical application involving intermediate scanning techniques including trauma and critical care patients, with imaging related to abdomen, pelvic, small parts and gravid uterus.
Prerequisites: E, M, R, DMSO 101, DMSO 102, DMSO 103, DMSO 104

213 SONOGRAPHIC PHYSICS II SPRING 3 (3-0)
Focus will be a review of the Doppler Effect, in addition to fluid dynamics, hemodynamics, harmonics, artifacts and developing a quality assurance program.
Prerequisites: E, M, R, DMSO 224

214 CLINICAL EXPERIENCE C SUMMER 5 (0-40)
Third in a five semester sequence of clinical application involving advanced scanning techniques including trauma and critical care patients with imaging related to abdomen, pelvic, small parts and gravid uterus.
Prerequisites: E, M, R, DMSO 200, DMSO 201, DMSO 202, DMSO 203, DMSO 204

224 CLINICAL EXPERIENCE D SUMMER, FALL 5 (0-40)
The fourth in a five-semester sequence of clinical application. Students will be expected to perform completed exams within departmentally allowed timeframes. Introduction to peripheral vascular scanning as time allows.
Pre-requisites: E, M, R, DMSO 214

230 INTRODUCTION TO VASCULAR SONOGRAPHY & LAB APPLICATIONS 4 (3-2)
Introduction to non-invasive vascular scanning with focus on terminology, basic anatomy, generic protocols and enhanced lab applications.
Prerequisites: E, M, R, DMSO 224

234 CLINICAL EXPERIENCE E FALL 3 (0-24)
The final in a five-semester sequence of clinical application. Students will be expected to perform advanced exams within departmentally allowed timeframes. Introduction to peripheral vascular scanning as time allows.
Prerequisites: E, M, R, DMSO 224

240 SONOGRAPHIC REGISTRY REVIEW 2 (2-0)
This course provides the student with review and self-examination in preparation for the American Registry of Diagnostic Medical Sonography Examinations.
Prerequisites: E, M, R, DMSO 213, DMSO 230, DMSO 234

DRAFTING & DESIGN (DRAF)

102 MACHINE DRAWING
SPRING 3 (1-4)
In this course, instruction will focus on mechanical concepts and the use of CAD to generate drawings and projects. Units of instruction will include sectional views, auxiliary views, threads/fasteners, weldments, advanced dimensioning/part tolerancing, geometric dimensioning and tolerancing, working drawings, assembly drawings and exploded views.
Prerequisites: ENGR 103 or ENGR 113

201 TOOL DESIGN I
SPRING 4 (2-4)
A course concerned with the theory, principles and techniques for the design of cutting tools, jigs and fixtures, and related tooling. The use of current ANSI standards will be applied to all designs. The use of on-line part libraries, handbooks and various catalogs will be used. Students will construct all working and assembly drawings for their designs and be able to defend their design intent.
Prerequisite: ENGR 103 or ENGR 113

202 TOOL DESIGN II
SPRING 3 (1-4)
Theory and practice of designing metal presswork dies, plastic injection molds or plastic compression molds. Students design and build individual designs. Course must be taken concurrently with MACH 220. May be offered in alternate formats.
Prerequisites: E, M, R, ENGR 103, DRAF 102, MACH 110

203 DESCRIPTIVE GEOMETRY
SPRING 3 (1-4)
Comprehensive study of combinations of points, lines, planes, injections, true sizes and shapes of plane areas, tangent planes measurement of angles and development of surfaces.
Prerequisites: ENGR 103

205 ARCHITECTURAL DRAWING SPRING 4 (2-4)
Theory and practice of designing metal presswork dies, plastic injection molds or plastic compression molds. Students design and build individual designs. Course must be taken concurrently with MACH 220. May be offered in alternate formats.
Prerequisites: ENGR 103 or ENGR 113

207 CAD-MECHANICAL DESIGN SPRING 3 (1-4)
Students will learn the basics of 3D parametric solid part modeling and detailing. Students will also learn to create a rapid prototype part in this course.
Prerequisite: ENGR 103 or ENGR 113

208 CAD-MECHANICAL DETAILING SPRING 3 (1-4)
This course will build upon the skills gained in DRAF 207. Students will design and construct 3D parametric models of various working machine products. Students will construct all necessary working drawings, assembly drawings and exploded views of their design intent. Current ANSI drafting standards will be applied. Students will also be offered the ability to create one of their designs using the rapid prototype equipment.
Prerequisites: DRAF 207

211 MACHINE DESIGN SPRING 3 (1-4)
Exit level course engages student in development of mechanical devices. Students will be involved with engineering of machinery and designing of mechanism, components and analysis of a project of their choosing. Student will create written proposals and problem statements as well as all necessary working drawings, assembly drawings, and parts manuals for their design. May be offered in alternate formats.
Prerequisites: ENGR 103 or ENGR 113, DRAF 102

DRAMA (DRAM)

110 PRINCIPLES AND PRACTICE OF ACTING I 3 (2-2)
Principles of acting for the stage. Emphasis on performing through exercises and scene work. Movement and voice work covered. Brief study of general theatre language and terms.
Prerequisite: R

111 PRINCIPLES AND PRACTICES OF ACTING II
3 (2-2)
Techniques and problems of a stage actor. Emphasis on performing scenes. Stresses character development and ensemble acting. Students develop audition pieces.
Prerequisites: DRAM 110 with a C or better

112 STAGECRAFT SPRING 3 (2-2)
Basics of technical theatre production. Study of set design and construction, basic lighting and sound principles and scenery styles. Work required on department productions. Course may be repeated once for additional credit.

113 MUSICAL THEATRE PERFORMANCE I
FALL 3 (3-0)
This is an introduction to the process of song, dance and text preparation for actors in the presentation of musical theatre performances. Emphasis will be given to the synthesis of text, song and dance in the communication of ideas as they are presented in a story, song, play or work of art.
Prerequisites: E, R

175 SUMMER THEATRE WORKSHOP 6 (6-0)
Experience as part of a professional production company. An array of tasks and duties as part of a company. It is highly recommended that students not enroll in other classes during this 7-week period.

201 INTRODUCTION TO THEATRE FALL 3 (3-0)
General theatre practice, dramatic types (comedy, tragedy, farce, etc.), areas of production, responsibilities and theatre history. Study of various dramatic types and periods, and attendance at theatrical performances. Semester culminates with class production of a project.
Prerequisites: E, R

202 THEATRE PRACTICUM FALL, SPRING 3 (3-0)
Supervised experience in one or more areas of theatre. The nature of involvement is determined by student theatre contract. Students may add class within one week after casting. Course may be repeated for credit.

220 INTRODUCTION TO THEATRE FOR YOUNG AUDIENCES & CREATIVE DRAMATICS 3 (3-0)
This course introduces students to the depth and possibilities of creative dramatics and the art of children's theatre. Students will learn about the history and significance of children's theatre/Theatre for Young Audiences and creative dramatics and conclude the course with a practical immersion in a facsimile classroom setting. This class is open to all majors.
Prerequisites: E, R

EARLY CHILDHOOD EDUCATION (ELCH)

110 INTRODUCTION TO CHILD DEVELOPMENT FALL, SPRING, SUMMER 3 (3-0)
This course serves as an introduction to child development. During this class, settings where children age six weeks to twelve years receive care and education will be examined. Factors such as quality, licensing and accreditation will be addressed. Also, included will be ways in which social, emotional, physical, cognitive and language development are supported in developmentally appropriate programs. This course will involve up to 10 hours of field observation in an early childhood education setting. This course is not applicable toward elementary education.
Prerequisites: E, R

111 EARLY CHILDHOOD LEARNING ENVIRONMENTS FALL, SPRING, SUMMER 3 (3-0)
This course explores how space and environments facilitate the implementation of goals in programs for infants, toddlers, preschoolers and school-agers (in before and after school programs) in a variety of settings. Within the context of environment, materials and equipment will also be explored. Opportunities to assess existing environments will be included. This course will involve up to 10 hours of field observation in an early childhood education setting. This course is not applicable toward elementary education.
Prerequisites: E, R

112 CURRICULUM PLANNING FOR THE YOUNG CHILD FALL, SPRING, SUMMER 3 (3-0)
This course will explore Developmentally Appropriate Practice (DAP) and the learning and developmental theories upon which it is based. Students will learn how to plan and implement curriculum that supports cognitive and language development. Opportunity will be given to plan several activities, implement them with a group of children and evaluate their effectiveness. Integration of learning through a study or project approach will also be addressed. This course will involve up to 10 hours of field observation in an early childhood education setting. This course is not applicable toward elementary education.
Prerequisites: E, R

113 GUIDING YOUNG CHILDREN'S SOCIAL DEVELOPMENT FALL, SPRING, SUMMER 3 (3-0)
This course explores specific strategies and methods that guide children's social development and their behavior. The ultimate goal is to promote growth in internal self-control. Students will learn techniques for listening and talking to children, guiding children's problem solving and choices and disciplining for inappropriate behavior. Weekly field experiences with children will provide opportunities to use the strategies that are presented. This course will involve up to 10 hours of field observation in an early childhood education setting. This course is not applicable toward elementary education certification.
Prerequisites: E, R

210 CURRICULUM PLANNING FOR THE YOUNG CHILD II FALL, SPRING, SUMMER 3 (3-0)
This course is a continuation of Curriculum Planning for Young Children I. Students will learn how to plan and implement curriculum that supports creative, social, emotional and physical development. The role of play in a child's development will be explored. Students will also gain knowledge of methods for documenting children's growth for use in planning and informing parents of their child's progress. This course will involve up to 10 hours of field observation in an early childhood education setting. This course is not applicable toward elementary education certification.
Prerequisites: E, R, ELCH 110 and ELCH 112

211 DIVERSITY IN CHILD DEVELOPMENT FALL, SPRING, SUMMER 3 (3-0)
This course introduces students to anti-bias curriculum and setting up an anti-bias classroom environment. Discrimination issues in all areas, including ethnicity, religion, gender, economic class, age, ability and sexual preference will be addressed. The student will examine their own attitudes and stereotypes and learn how to create an environment where differences are appreciated and valued; and where confident self-identities are developed. Opportunities will be given to learn about equipment, materials and curriculum that will support such an environment. This course will also look at ways to help children stand up for oneself and take action in unjust situations. This course will involve up to 10 hours of field observation in an early childhood education setting. This course is not applicable toward elementary education certification.
Prerequisites: E, R

212 ADMINISTRATION OF EARLY CHILDHOOD PROGRAMS FALL, SPRING, SUMMER 3 (3-0)
This course addresses the administrative responsibilities of operating an early childhood program. Topics that are addressed include developing a program philosophy and budget, choosing a site and designing the environment, hiring and supervising staff, planning curriculum and involving parents. Students will interact with a program administrator to better understand the role and work in groups to design a model program. This course will involve up to 10 hours of field observation/shadowing a program center director in an early childhood education setting. Child

Development associate degree majors are encouraged to take this course as their final capstone course.
Prerequisites: E, R, ELCH 110 and ELCH 111 or BIOL 170

213 CURRENT ISSUES IN EARLY CHILDHOOD EDUCATION FALL, SPRING, SUMMER 3 (3-0)
This course explores current issues in the field of early childhood education and assists students in forming research-based responses to these issues. Current topics that will be addressed include gender issues, media and technology, child abuse and neglect, working with a diverse population of families, quality in childcare, kindergarten readiness and recent brain research. Students will also learn strategies for advocating for critical issues that affect young children and their families. This course will involve up to 10 hours of field shadowing in an early childhood education setting. This course is not applicable toward elementary education certification.
Prerequisites: E, R

EDUCATION (EDUC)

101 FOUNDATIONS OF EDUCATION FALL, SPRING 3 (3-0)
This is an introductory and exploratory course for students thinking about pursuing careers as teachers or paraprofessionals. Students will study a variety of topics, including the history of American education, the nature of American schools, social class and ethnic backgrounds of students, curriculum, disciplinary practices, teacher roles and responsibilities and current issues and problems in education.
Prerequisites: E, R

ELECTRONICS (ELEC)

100 DC ELECTRICITY FALL, SPRING 4 (3-2)
Fundamentals of direct current (DC) electricity. Concepts include voltage, current, resistance, power, Ohm's Law, electromagnetism and identification, and operation and characteristics of passive components. Circuit analysis introduced using Ohm's and Kirchoff's Voltage and Current Laws involving series, parallel and compound circuits. Circuit construction from schematics and use of basic test equipment in lab.
Prerequisites: R, M

106 A.C. ELECTRICITY FALL, SPRING 3 (2-2)
Beginning course in alternating current (AC) electricity. Topics include average, effective, peak, period and frequency of sine wave. Reactance, impedance and phase relationship of current and voltage in R-C, R-L and RLC circuits. Resonance, time constants and complex numbers covered. Use of oscilloscope and meters in lab.
Prerequisites: R, M, ELEC 100

108 ELECTRONICS TECHNOLOGY FALL, SPRING 2 (2-0)
Study of theory of semiconductor devices, OP-Amp basics and applications, digital circuits. Concepts will include P-N junction, diodes and power supply circuits, BJT, FET and thyristor basics; op-amp basics, operation, characteristics and applications; number systems, logic gates, logic circuit simplification, flip-flop and counter circuits.
Prerequisites: E, M, R, ELEC 100

109 INTRODUCTION TO RESIDENTIAL WIRING AND CABLING FALL, SPRING 4 (2-3)
The course will introduce the students to electrical safe practices associated with residential wiring and cabling. Subjects include: electrical safety, service entrance, receptacles and switch circuits, the National Electrical Code, and cable installation and terminations.
Prerequisites: ELEC 100

111 SEMICONDUCTORS FALL, SPRING 4 (0-5)
Study of commonly used solid state devices including diodes, special application diodes, bipolar function transistors, field effect transistors, MOSFET, UJT, triac, thyristors and power control circuits. Discussion of most commonly used semiconductor devices and their theory of operation. Emphasis on characteristics of operation and application. Includes troubleshooting.
Prerequisites: E, M, R, ELEC 100, ELEC 106

113 DIGITAL ELECTRONICS FALL, SPRING 4 (3-2)
Study of basic building blocks of modern digitally operated electronic equipment, operation of digital logic gates, number systems, flip-flops, TTL/CMOS, ripple counter, synchronous counter, shift register and other sequential logic operations. Various digital equipment, basic computer operations and troubleshooting included.
Prerequisites: E, M, R, ELEC 100, ELEC 106, ELEC 111

116 LINEAR ELECTRONICS FALL, SPRING 4 (0-5)
Study of operational amplifiers, filter, voltage comparators, drivers and converters. Typical op-amp circuits include inverting and non-inverting amplifiers, integrators and comparators. Filter circuits covered include low, high and band pass; typical oscillator circuits covered will be wien-bridge, LC and multivibrators. Power supply circuits such as rectifiers, regulators and filtering are part of course.
Prerequisites: E, M, R, ELEC 100, ELEC 106, ELEC 111

142 INTRODUCTION TO OPERATIONAL AMPLIFIERS FALL, SPRING FEE 3 (2-2)
This course introduces the student to the theory of operation, the design and application of circuits containing integrated circuit (IC) operational amplifiers (op-amps). Typical op-amp circuits covered include: inverting and non-inverting amplifiers, summing and difference amplifiers.
Prerequisites: ELEC 100 and ELEC 106 with a C or better

151 TRANSFORMERS, MOTORS AND MOTOR CONTROLS
SPRING 4 (3-2)
Generation of AC voltage, transformers action and principles of AC motors. Delta and wye transformer connection, and single-phase and three-phase motor controls. Students read and interpret motor and transformer electrical diagrams. Laboratory exercises provide theory/practical application relationships.
Prerequisites: ELEC 100, ELEC 106

152 ELECTRICAL MOTOR CONTROLS II
FALL, SPRING 4 (3-2)
Course will continue to build upon knowledge and skills obtained in ELEC 151 Transformers, Motors and Controls with a focus on advanced principles and applications of motor control common in the electrical industry. Students will develop and interpret complex ladder diagrams. Students will be introduced to the operation and use of programmable logic controllers (PLCs) and variable frequency drives (VFDs) in motor control. Students will complete lab exercises to provide a hands-on learning experience to establish relationships between the theory and practical application of the material presented.
Prerequisites: ELEC 151, MANU 120

153 DIGITAL SIGNAL PROCESSOR
FALL, SPRING, SUMMER FEE 3 (0-3.75)
Study of digital signal processor, CPU architecture, central arithmetic logic unit, program execution, addressing and peripherals. Hardware and software features for program control and use of DSP as FIR filter covered.
Prerequisites: E, M, R, ELEC 100, ELEC 106, ELEC 113, ELEC 208 or equivalent.

160 INSTRUMENTATION AND PROCESS CONTROL
FALL, SPRING FEE 3 (2-2)
This course is designed to provide students with basic operational knowledge and skills in working with industrial instrumentation and the principles of instruments, instrumentation diagrams and control. This course consists of classroom instruction and hands-on laboratory activities designed to reinforce the learning process and prepare students to perform basic manipulation of the fundamental controls of temperature, pressure, level and flow instrumentation.
Prerequisites: ELEC 100, ELEC 106 both with a C or better

208 MICROPROCESSORS
FALL, SPRING FEE 4 (0-5)
Microprocessors, architecture, programming, internal function blocks and troubleshooting. Typical microprocessor systems covered. Use of assembly language applications to control stepper motors, AD and DA conversion and other peripheral hardware.
Prerequisite: E, M, R, ELEC 100, 106, 111, 113

211 SOLDERING FALL, SPRING FEE 1 (1-0)
Survey course about terminology and types of solder, techniques of soldering and unsoldering terminals and components to circuit boards, and various tools used in soldering process. Assembly of sample circuit board used to practice proper techniques.
Prerequisite: E, M, R

214 PC MAINTENANCE FALL, SPRING FEE 4 (0-5)
Personal computer system operation, maintenance and repair. Systems covered include computer, keyboard, monitors, disk drives and printers. Instruction on use of diagnostic software, POST and setting up system is part of course. Students required to troubleshoot, identify and replace defective elements of system.
Prerequisite: M, R, ELEC 113

216 SOLDERING II - SURFACE MOUNT TECHNOLOGY (SMT)
FALL, SPRING FEE 1 (0-2)
This survey course will cover terminology, as well as the soldering and de-soldering techniques applied to removing or attaching surface mount devices (SMD) to printed circuit boards. This course also covers the various tools and procedures, component identification and proper placement, as well as applicable industry standards used in the process. Assembly of an SMT circuit board provides practical application of covered material.
Prerequisites: ELEC 211

230 INDUSTRIAL ELECTRONICS
FALL, SPRING FEE 4 (3-2)
Study of control devices such as switches, relays (electromechanical and solid state), timers and motor controls. Also covers transducers and sensors such as t/c's, strain gauges and thermistors. Introduction to analog controllers and closed loop systems.
Prerequisite: E, M, R, ELEC 100, 106, 111

231 COMMUNICATION ELECTRONICS
FALL, SPRING FEE 4 (3-2)
Methods, circuits and devices used for transmission and receiving of information. Modulation concepts, satellite, two-way and optical communications. Introduction to principles and concepts of microwave and fiberoptic transmission of data.
Prerequisites: E, M, R, ELEC 100, 106, 111

264 PROCESS CONTROL APPLICATIONS
FALL, SPRING FEE 3 (2-2)
This course is designed to build upon the students' fundamental knowledge and skills by exploring advanced operational characteristics of industrial instrumentation and control instruments, instrumentation diagrams and control. This course consists of classroom instruction and hands-on laboratory activities designed to reinforce the learning process and prepare students to perform advanced manipulation and the instrumentation and controls of temperature, pressure, level and flow systems.
Prerequisites: ELEC 150 with a C or better

ENERGY (ENGY)

100 NUCLEAR INDUSTRY FUNDAMENTALS CONCEPTS
FALL, SPRING 3 (3-0)
This course introduces fundamental concepts used throughout the nuclear industry as an integral part of daily operations. Topics include: human performance enhancement (HPE) fundamentals; an introduction to the systematic approach to training (SAT); conduct of on-the-job training (OJT) and task performance evaluation (TPE); foreign material exclusion (FME); and an overview of the First Energy Nuclear Operating Corporation (FENOC) safety manual.
Pre-requisites: E, M, R

111 ENERGY GENERATION & DISTRIBUTION
FALL, SPRING 3 (3-0)
This course is designed to introduce students to the energy industry by examining the industry from a production to consumption view. Students will explore the industry from a historical perspective by studying the evolution of energy production, as well as the transmission and distribution aspects of providing power to civilization. Current energy industry production and distribution technology, methods and fundamental concepts will be studied. In addition, students will examine present and future energy options to meet the needs of society by exploring renewable resources such as wind, geothermal, solar and other emerging energy sources. Students will examine the operation of the "machine" that is the energy grid and begin to understand the many parts and entities involved with controlling the machine. Students will be introduced to some of the governing bodies associated with the energy industry such as the Federal Energy Regulatory Commission (FERC), the Nuclear Regulatory Commission (NRC) and the Department of Energy (DOE).
Prerequisites: E, M, R

116 CHEMISTRY & RADIATION PROTECTION FUNDAMENTALS FALL, SPRING 3 (3-0)
This course will explain and apply the basic concepts of water chemistry control and reactor water chemistry, explain the principles of radiation detection and monitors, and the effects of radiation on matter, including body tissue. Students will perform calculations involving time, distance, shielding and dose rate, and describe the methods used for limiting radiation exposure and contamination.
Prerequisites: ENGY 100 or ENGY 111 with a grade of C or better

120 ENERGY PLANT DRAWINGS
FALL, SPRING 3 (2-2)
This course covers the use of and relationship among typical drawings found at a power plant. Topics include using mechanical, electrical and isometric drawings; the information contained in the lead sheet of a set of drawings; the use of notes and legends; standard symbology used in engineering drawings; and the use of various types of drawings together in order to perform work, locate components, or use for other typical applications.
Prerequisites: ENGY 100 or ENGY 111 with a grade of C or better

150 CODES & STANDARDS FALL, SPRING 3(3-0)
Studying the interpretation and application of codes and standards in wind energy.
Prerequisites: M, R

155 WIND ENERGY APPLICATION
FALL, SPRING FEE 3 (2-2)
Explaining and applying the basic concepts of wind energy applications.
Prerequisites: M, R and ENGY 150 with a C or better (may be taken concurrently)

160 WIND INSTALLATION
FALL, SPRING 3 (1-3)
This course introduces fundamental concepts used to install small wind components.
Prerequisites: M, R, ENGY 155 with a C or better (classes may be taken concurrently)

165 SMALL WIND MAINTENANCE
FALL, SPRING 3 (1-3)
Troubleshooting, preventative maintenance and repair methods for small wind maintenance systems common to the field of wind energy.
Prerequisites: M, R and ENGY 160 with a C or better (classes may be taken concurrently)

182 BOILER THEORY, SAFETY and DESIGN SYSTEMS
FALL, SPRING 3 (3-0)
This course provides an understanding of the concepts related to boiler design, boiler and boiler auxiliary equipment protection, combustion, heat production, steam production, boiler efficiency and operation.
Prerequisites: MATH 110 or MATH 122 and ENGY 111 and PHYS 110 all with a C or better.

184 FOSSIL FUEL CYCLE FALL, SPRING (3-0)
This course provides an understanding of the fuel handling and preparation processes used at a fossil fuel-electric generating station; the byproducts created as a result of combustion; the equipment put in place to measure and control those byproducts; and the regulatory requirements in place to protect the general public, the environment and site workers.
Prerequisites: MATH 110 or MATH 122 and PHYS 110 and CHEM 101 and ENGY 111 with a C or better.

185 LINE WORKER ORIENTATION SUMMER 1 (1-0)
This course provides prospective line worker apprenticeship candidates with an overview of the work they will be required to do as an apprentice and journeyman line worker. Students are introduced to the physical aspects and mental discipline required to perform the duties of a line worker with demonstrations and physical tests.

186 LINE WORKER SUMMER FEE 12 (12-4)
This course is designed to provide students with basic knowledge, pole climbing skills and basic Ground Worker/Utility Worker knowledge necessary to progress through the Line Worker certificate program.
Prerequisite: ENGY 185

188 LINE WORKER FIELD EXPERIENCE
SUMMER **2 (0-2)**
This field experience is a planned work activity that is designed to introduce the student to the primary technical areas of the line worker field. This will help the student select possible career paths for full-time employment upon graduation.
Prerequisites: ENGY 185, 186

190 INTRODUCTION TO THE UTILITY INDUSTRY
SUMMER **3 (2-2)**
This course will provide a basic understanding of the overall electric power system, utility safety and basic use of line worker tools; pole climbing will also be introduced.
Prerequisites: ENGY 185, may be taken concurrently with ENGY 191, ENGY 192, ENGY 193.

191 CLIMBING & WORKING IN ELEVATED WORK SITES
SUMMER **3 (2-2)**
This course focuses on how to safely and effectively ascend and descend wooden poles using pole climbing gaffs, hooks, belts, fall arrest systems and associated equipment and ladders.
Prerequisites: ENGY 185, May be taken con-currently with ENGY 190, ENGY 192, ENGY 193

192 UTILITY CONSTRUCTION FUNDAMENTALS
SUMMER **3 (2-2)**
This course orients students, in an outdoor lab setting, to the proper and safe construction and maintenance of overhead electric systems. Focus will include diagnostic equipment of transformer function, installation, selection and troubleshooting.
Prerequisites: ENGY 185, May be taken concurrently with ENGY 190, ENGY 191, ENGY 193

193 ENERGY PRODUCTION TECHNOLOGY
SUMMER **3 (2-2)**
Proper overhead construction techniques will be demonstrated and practiced. Topics will include tool selection, pole selection and setting, rigging, safety procedures and maintenance techniques.
Prerequisites: ENGY 185, may be taken concurrently with ENGY 190, ENGY 191, ENGY 192

200 POWER PLANT MATERIALS
FALL, SPRING **3 (2-2)**
This course provides students with an understanding of the various materials used in the construction and operation of a nuclear power plant. Topics include metals and alloys; effect of environment, process fluid type and radiation on the selection of materials; an overview of fracture mechanics and brittle fracture; design margin; and hazards associated with reactor plant materials.
Prerequisites: ENGY 100 or ENGY 111 and MATH 122 and PHYS 110 all with a C or better

205 ENERGY FIELD EXPERIENCE
FALL, SPRING **2 (2-0)**
This field experience is a planned work activity that is designed to introduce the student to the primary technical areas within a power plant. During the field experience, students will have introductory instruction in the general operations of a power plant. They will then experience the various technical areas by rotating through the departments at the power plant. This will help the student select possible career paths for full-time employment upon graduation. Students will spend a minimum of 30 hours in the plant.
Prerequisites: ENGY 100 with a grade of C or better or ENGY 111 with a grade of C or better and ENGY 116 with a grade of C or better

210 RADIATION DETECTION & PROTECTION
FALL, SPRING **3 (2-2)**
This course presents an overview of the physics and chemistry of radiation and radioactive materials. The course will consist of descriptions of a number of different applications of radiation, their associated radionuclides, context(s) and rationale(s) of use, interactions with matter, shielding and energetic decay products, and their production in reactors or accelerators. Included in the course will be appropriate mathematics, such as unit conversions and exponentials.
Prerequisites: ENGY 100 or ENGY 111 with a grade of C or better and MATH 122 with a grade of C or better and PHYS 110 with a grade of C or better

223 RADIATION MONITORING
FALL, SPRING **3 (2-2)**
This course presents scenarios in which radiation protection technicians (RPTs) monitor sources of radiation. A focus of this course will be on theory and operation of radiation monitors, maintenance and calibration of these systems, proper selection and use of various monitoring systems for evaluation of radioactive hazards and the interpretation and reporting of such evaluations. Laboratory exercises are included.
Prerequisites: ENGY 100 or ENGY 111 with a C or better and ENGY 200, ENGY 205, ENGY 210, ENGY 225, ENGY 230, ENGY 235 all with a grade of C or better

225 REACTOR THEORY, SAFETY & DESIGN SYSTEMS
FALL, SPRING **3 (3-0)**
This course provides an understanding of the concepts related to reactor plant protection, including fission process product barriers, limiting conditions for operation and safety limits, the basic concepts related to accident analysis, transient prevention, mitigation of core damage and accident management. Basic information about major industry operating experience is included.
Pre-requisites: ENGY 100 or ENGY 111 with a C or better and MATH 122 with a C or better and PHYS 110 with a C or better

230 THERMO-FLUID SCIENCE
FALL, SPRING **3 (3-0)**
This course presents basic concepts of thermodynamics, heat transfer and fluid dynamics as they apply to power plant applications. It covers the topics of energy, entrophy, thermodynamic cycles, heat transfer and fluid dynamics. The course also discusses the basics of important pieces of equipment such as turbines, heat exchangers, pumps and valves.
Prerequisites: ENGY 100 or ENGY 111 with a C or better and MATH 122 with a C or better and PHYS 110 with a C or better

233 DOSIMETRY FALL, SPRING 3 (2-2)
A study of radiation biology, radiation effects on simple chemical systems, biological molecules, cells, organisms and humans. Stochastic vs. deterministic effects, units of exposure, dose and dose equivalent, external dosimetry, internal dosimetry, control of external and internal exposure, detector and instrumentation systems for measuring dose are included.
Prerequisites: ENGY 223 with a grade of C or better

235 POWER PLANT COMPONENTS FALL, SPRING 3 (3-0)
This course introduces students to fundamental components and pieces of equipment that are used throughout electrical power generating facilities such as pumps, valves, heat exchangers, motors and generators. It will cover the purpose, construction, theory of operation and typical maintenance requirements of these devices.
Prerequisites: ENGY 100 or ENGY 111 with a grade of C or better and MATH 122 with a grade of C or better and PHYS 110 with a grade of C or better

240 CAPSTONE & CASE STUDY IN ENERGY PRODUCTION TECHNOLOGY FALL, SPRING 2 (2-0)
This is a capstone course that will utilize topics that were covered throughout the curriculum. A large portion of the course will examine case studies from the power generation industry. It will also examine case studies of incidents from other industries. The course will discuss precursors to poor decision making and how the proper use of human performance enhancement (HPE) and event free tools can minimize the risks of accidents. This course will also introduce students to pre-job interviewing and testing.
Prerequisites: ENGY 100 with a grade of C or better or ENGY 111 with a grade of C or better and ENGY 116, ENGY 200, ENGY 205, ENGY 225, ENGY 230, ENGY 235, all with a grade of C or better

243 RADIATION MATERIALS AND CONTROL FALL, SPRING 3 (2-2)
The course presents scenarios in which RPT's are required to provide safe control, movement, use, storage, transportation and disposal of radioactive materials.
Prerequisites: ENGY 233 with a grade of C or better

249 SAFETY RESPONSE FALL, SPRING 3 (2-2)
Practical applications and demonstrations of radiation protection and health physics. Radiological survey & analysis instruments, radiation monitoring systems, sample collection equipment, calibration sources and equipment, radiological protection standards, contamination control, monitoring of radiological work, radiological incident evaluation and control, decontamination, radioactive materials control, and environmental monitoring will be introduced.
Prerequisites: ENGY 233 with a C or better

250 GENERAL MAINTENANCE SYSTEMS & COMPONENTS FALL, SPRING 3 (3-0)
The topics build on general systems and components knowledge. Component types and characteristics, common failure mechanism and operation principles of plant components will be included.
Prerequisites: ENGY 100 or ENGY 111 with a C or better and ENGY 116, ENGY 200, ENGY 205, ENGY 230, ENGY 235 all with a grade of C or better

253 RADIATION PROTECTION CAPSTONE FALL, SPRING 3 (3-0)
The course is a capstone course using a problems-based approach to learning. This course will present radiation protection problems embedded in different radiation contexts, the majority of which are nuclear power reactor-based. Participants will be tasked with solving such problems as providing radiological coverage of jobs and high-risk and low-risk activities (e.g. outages), planning for protection from hazardous radiation, monitoring of activities in radioactive zones and responding to emergencies.
Prerequisites: ENGY 223, ENGY 233, ENGY 243, ENGY 249, all with a grade of C or better.

255 MECHANICAL MAINTENANCE SYSTEMS & COMPONENTS FALL, SPRING 3 (2-2)
The topics build on mechanical systems and components knowledge. Mechanical component types, characteristics and applications will be included.
Prerequisites: ENGY 100 OR ENGY 111, ENGY 116, ENGY 200, ENGY 205, ENGY 225, ENGY 230, ENGY 235, ENGY 250 all with a C or better

257 ELECTRICAL SYSTEMS & COMPONENTS MAINTENANCE FALL, SPRING 3 (2-2)
These topics build on the electrical systems and components knowledge that are required for electrical maintenance personnel.
Prerequisites: ENGY 100 OR ENGY 111, ENGY 116, ENGY 200, ENGY 205, ENGY 225, ENGY 230, ENGY 235, ENGY250 all with a C or better.

259 INSTRUMENT & CONTROL MAINTENANCE SYSTEMS & COMPONENTS FALL, SPRING 3 (2-2)
The topics build on instrument and control systems and components knowledge.
Prerequisites: ENGY 100 or ENGY 111, ENGY 116, ENGY 200, ENGY 205, ENGY 225, ENGY 230, ENGY 235, ENGY 250 all with a C or better

270 MECHANICAL OPERATIONS FALL 3 (2-2)
This course covers the construction, application and operation of mechanical components in the power plant.
Prerequisites: ENGY 100 or ENGY 111 with a C or better and ENGY 116, ENGY 200, ENGY 205, ENGY 225, ENGY 230, ENGY 235, ELEC 100, ELEC 106 all with a C or better

274 ELECTRICAL & HVAC OPERATIONS FALL, SPRING 3 (2-2)
This course covers the basic operation of electrical and HVAC systems associated with a power plant. It also describes basic construction, application and operation of basic electrical and HVAC power plant components.
Prerequisites: ENGY 270 with a C or better

278 OPERATION OF POWER PLANT COMPONENTS
FALL, SPRING 3 (2-2)
This course provides basic knowledge needed to operate and monitor components associated with various systems in the power plant.
Prerequisites: ENGY 274 with a grade of C or better

ENERGY PRODUCTION AND DISTRIBUTION MANAGEMENT (EPDM)

300 ENERGY PRODUCTION TO CONSUMPTION
SPRING 3 (3-0)
This course provides an overview of the electric power system life cycle from production to consumption. Students will explore the technology, the marketplace and government regulations associated with electric power systems. Students will study past and present trends in energy production, transmission and consumption including the impact of socio-political, regulatory and economic conditions associated with converting, generating, transporting and consuming energy. Students will also learn to analyze current trend data to project future energy industry challenges and solutions.

301 FINANCE AND ACCOUNTING FOUNDATIONS
SPRING 4 (4-0)
Finance and accounting are the "languages of business" and managers in all organizations must be fluent in finance and accounting to control operations and participate in planning and decision-making. This course aims to provide an introduction to accounting and financial management in order for managers to execute their responsibilities and work collaboratively with the organization's finance and accounting professionals. Topics include double-entry accounting, financial statement analysis, discounting, methods of depreciation, and inventory valuation and financial ratios. Students also study the role of accounting and finance in short and long-term operational and capital budgeting, decision-making and analyzing performance to budgets.
Prerequisites: MATH 128 or MATH 130 or MATH 135, BUSA 216 or MATH 216

310 INTEGRATED COMMUNICATIONS IN BUSINESS
FALL 3 (3-0)
Business requires professionals to be thoughtful senders and receivers of information with customers, employees, regulators and managers in a variety of contexts, including crisis and conflict. Business communications include a spectrum of activity from complex presentations to personal meetings, group writing and email. This course teaches students to think strategically about communication in order to write, speak and listen effectively in order to improve results. Students study written and oral communications from the perspective of both the sender and the receiver in order to enhance the student's ability to analyze a situation, adapt to the sender/receiver, and channel and communicate effectively in any context. Students begin by exploring principles of communication before examining oral and written communication, visual aids, formal presentations and meetings in more detail.
Prerequisite: ENGL 102 or ENGL 103, COMM 101

315 HUMAN PERFORMANCE SPRING 3 (3-0)
The purpose of this course is to emphasize the importance of human performance in the safe and efficient operation of energy production facilities. Students will learn leadership behaviors that support the development of a human performance culture in the workplace. The course focuses on concepts necessary to anticipate and prevent errors at the job site and learn the skills to discover and eliminate process and cultural weaknesses in the organization. Students will learn methods for organizing, planning and monitoring work activities, and providing feedback to co-workers regarding the interrelationships associated with human performance.

320 HUMAN RESOURCES MANAGEMENT
SPRING 3 (3-0)
Regardless of their function, all managers work in concert with human resource (HR) professionals to manage and maximize the organization's human resources. This course aims to familiarize students with fundamental HR principles. It explores the role of managers in recruitment, selection, training, development, appraisal, safety and health, labor relations, problem management, and compensation and benefits in order to drive effectiveness and efficiency in the organization. Additionally, students will investigate the role of strategic HR management as a resource for an organization's competitiveness in the marketplace and the human resource impact on an organization's culture and norms.
Prerequisites: BUSA 211 or BUSA 220

325 LEADERSHIP IN INDUSTRIAL SETTINGS
FALL 3 (3-0)
Leadership is often described as the ability to accomplish objectives through others. Leaders are required, therefore, in all human endeavors from athletic teams to the highest offices in government and business. Leadership does not take the same form in every human endeavor, however, and is a highly contextualized art. This course provides students with an understanding of leadership within the context of a modern power production setting in order to empower the student to act as a leader of diverse work teams in production, maintenance, or operations. Students are exposed to leadership theories, styles and models as well as the common characteristics of leaders in order for students to reflect on their own style and preferences. After exploring their own preferences, students turn their attention to setting the conditions for employee success, including creating a vision; communicating; setting priorities and expectations; role-definition; delegation; employee development; employee empowerment; team effectiveness; and providing employees prompt, supportive and accurate feedback.

350 ENERGY ECONOMICS SPRING 3 (3-0)
Energy is a key input in local, state, regional and national economies and consequently has significant impact on economic growth. This course explores and uses economic models to better understand energy marketplaces. Students will examine the short-run and long-run supply, demand and environmental considerations of oil, natural gas, coal, electricity, nuclear and alternative power sources. This examination requires students to understand local, state, regional, national and international policy implications on supply and demand in energy marketplaces, including regulation/deregulation, taxes, incentives and emissions control on production and consumption, to include consumers and select industries. Students will also study energy security in terms of energy availability, price stability and considerations for an economy to transition sources of energy.
Prerequisites: BUSA 200

375 APPLIED ETHICS IN BUSINESS FALL 3 (3-0)
Applied Ethics in Business offers an introduction to the subject of ethical behavior in business. This course will prepare students for their roles as ethical leaders among employees and other stakeholders. The course explores common personal, social and professional ethical issues and presents analytical frameworks useful for management decision-making. Students will examine the five approaches to ethical decision-making, as well as strategies for managing ethically.

400 LAW AND REGULATORY ISSUES IN ENERGY
FALL 3 (3-0)
All leaders and managers must work within, monitor and often provide guidance in the adherence to and/or implementation of applicable codes, standards, legal and regulatory requirements. This course aims to familiarize students with the purpose and function of the governing or contributing bodies at the state and federal level in producing and enforcing the many laws and regulations associated with power plant operations and maintenance activities. Topics will include: public law, code of federal regulations, the Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA) regulations, Department of Transportation (DOT) requirements, the Nuclear Regulatory Commission (NRC) and applicable state and local laws. The role of the Institute of Nuclear Power Operations (INPO) will also be discussed.
Prerequisites: EPDM 350

435 EMPLOYEE TRAINING – A SYSTEMATIC APPROACH
SPRING 3 (3-0)
Responsibility for the safe operation of power production facilities is a line-management function. Well-trained personnel are fundamental to safe plant operation. This course introduces students to the processes used to ensure that training is conducted efficiently and effectively and is directly related to the needs of the job. Students will learn to implement a systematic approach to training and resolve performance problems.
Prerequisites: EPDM 320

450 MANAGEMENT FOR QUALITY ASSURANCE AND CONTROL FALL 3 (3-0)
Production and maintenance operations are inherently variable, and variability can increase waste and downtime, decrease reliability and negatively impact quality and safety. Quality assurance and control presents methods to analyze, develop, execute and sustain robust processes and procedures in order to enhance safety and reliability while complying with regulatory requirements. Students are exposed to concepts and tools which enable first-time yield. Students also explore cause-and-effect, root-cause and variation analysis using statistics, probability, control charts and non-destructive examination. Specific emphasis is placed on the importance of line personnel in the execution of a quality assurance and control program.
Prerequisites: BUSA 216 or MATH 216

475 PROJECT MANAGEMENT SPRING 3 (3-0)
This course presents the tools and techniques utilized by project managers (PMs) to successfully plan, organize, motivate and control resources to achieve specific goals and outcomes associated with a given project. Students will explore concepts and tools that enable PMs to achieve project goals and objectives, while honoring the recognized constraints of scope, time, quality and budget. Emphasis is placed on the process of project management from inception to completion, the role of the PM and the development of applicable knowledge and skills necessary to successfully manage projects throughout their life-cycle. Students will be introduced to computer software typically used in project management.

495 CAPSTONE IN ENERGY PRODUCTION AND DISTRIBUTION MANAGEMENT
SUMMER 3 (3-0)
This capstone course requires students seeking graduation from the Energy Production and Distribution Management Program to apply their knowledge and skills and present a written paper that includes the following:

- Analyze a case study from the energy production industry. Apply overall knowledge of the energy industry, business fundamentals and leadership/management theories and applications to problems from the energy production industry.
- Summarize five core courses taken as part of the Energy Production and Distribution Management Program and highlight the ways in which the courses prepared the student to work in the energy production industry or related field.
- Describe the internship, outage, or other related work experience completed during the program and how course work related to the experience. Emphasis should be on lessons learned during the work experience.
- Develop written goals for employment in the energy production industry with a comprehensive plan to accomplish your goals.

The final written paper will be presented in standard APA format using proper English, spelling, punctuation, grammar and paragraph structure.
Prerequisites: Prior completion of all program requirements

ENGINEERING (ENGR)

103 BEGINNING ENGINEERING DRAWING
FALL, SPRING FEE 4 (2-4)
Introductory technical drawing course that includes lettering, geometric construction, sectional views, dimensioning techniques, basic 2D CAD and pictorials. Drawing skills and knowledge gained by students through exercises including text assignments, handout assignments and chapter tests. Students learn to produce and evaluate blueprints.
Prerequisites: E, M, R

113 ENGINEERING DESIGN & GRAPHICS
FALL, SPRING FEE 4 (2-4)
Beginning engineering drawing course that introduces principles of computer aided drafting, basic 3D solid modeling, orthographic projection, sectional views, dimensioning techniques and auxiliary view construction. Textbook assignments, handout assignments and chapter tests are used to support and access student learning.
Prerequisites: E, M, R,

205 DESCRIPTIVE GEOMETRY SPRING 3 (1-4)
Problems combining point, line and plane, intersections, developments, warped surfaces and tangent planes.
Prerequisite: ENGR 103

210 ADVANCED CAD TECHNIQUES
FALL, SPRING FEE 3 (1-3)
Advanced CAD Techniques is a course designed to expose the students to commonly used design software. Topics include threads and fasteners, the application of tolerances, ordinate dimensioning, baseline dimensioning, hole charts, creating a CAD part template and drawing template, and assigning physical properties to a 3-dimensional part.
Prerequisite: ENGR113

ENGLISH (ENGL)

010 FOUNDATIONS OF COLLEGE WRITING
FALL, SPRING, SUMMER 3 (3-1)
This course focuses on learning and practicing the foundational processes of written communication necessary for college writing, including critical reading and thinking, planning, drafting, incorporating reader feedback, revising, editing, and basic techniques for incorporating sources and citation. Students will be expected to learn how to achieve a high level of quality for complete, well-organized essays that fully communicate a coherent position to readers.
Prerequisites: Compass writing score of 0-42 and Compass reading score of 50 – 67 or READ 083

093 FOUNDATIONS OF COLLEGE WRITING
FALL, SPRING, SUMMER 4 (4-0)
This course focuses on learning and practicing the foundational processes of written communication necessary for college writing, including critical reading and thinking, planning, drafting, incorporating reader feedback, revising, editing and basic techniques for incorporating sources and citation. Students will be expected to learn how to achieve a high level of quality for complete, well-organized essays that fully communicate a coherent position to readers.
Prerequisites: Compass Writing of 25 or Asset Writing of 36 or ENGL091with a C or better AND R or Concurrent Enrollment in READ 087.

099A COLLEGE WRITING ENRICHMENT
SPRING 3 (3-0)
This is a companion course that offers learning and writing support with a linked ENGL 101 class. This class focuses on expository writing and the closely related activities of critical reading and thinking. Primary attention is given to the formal elements of short essays based upon or incorporating documented source material. (Passing this class **and** co-requisite English 101 section allows the student to take English 102 or 103, thus completing the first year English Composition requirement. Compass writing score of 0-42 plus Multiple Measures Assessment. Co-requisite with corresponding ENGL 101 ALP section. Successful completion of 099A and co-requisite ENGL 101 will meet the Reading prerequisite.)
Prerequisites: Compass writing score of 43-77 and Compass reading score of 68-77 or READ 083; or ENGL 010.

101 ENGLISH COMPOSITION
FALL, SPRING, SUMMER **3 (3-0)**
First course in two-semester English sequence focuses on expository writing and closely related activities of critical reading and thinking. Primary attention given to formal elements of short essays based upon or incorporating documented source material. (This sequence can be completed by taking either ENGL 102 or 103).
Prerequisites: E, R

102 ENGLISH COMPOSITION
FALL, SPRING, SUMMER **3 (3-0)**
Extension and intensification of elements of expository writing and critical reading and thinking covered in ENGL 101. Particular emphasis given to formal, stylistic and rhetorical considerations and techniques involved in developing longer critical essays that incorporate documented evidence from broad range of source materials.
Prerequisite: ENGL 101

103 TECHNICAL WRITING
FALL, SPRING, SUMMER **3 (3-0)**
Helps students write with greater skill, confidence and effectiveness on jobs. Writing assignments develop ability to analyze specific organization, purposes and situations and to use appropriate content, organization, style, form and format. Writing assignments include job application letter and resume, summary, process explanation, proposal, various short reports, research report and a formal report. Either ENGL 102 or ENGL 103 in addition to ENGL 101 will fulfill English Composition requirements.
Prerequisites: E, R and ENGL 101

201 GENDER STUDIES
ON DEMAND **3 (3-0)**
Explores relationship between self-definition and gender expectations through drama, fiction, poetry and nonfiction; examines process of selfhood and influence of culture and analyzes relationship between narrative form and gender expectations.
Prerequisites: E, R

203 MASTERPIECES OF ENGLISH LITERATURE I
ON DEMAND **3 (3-0)**
Examples of the major types of English literature are studied. The study focuses on appreciation of thought and expression. The work begins with the Anglo-Saxon period and ends with the eighteenth century. Literary types studied include the epic, the ballad, the tale, the allegory and the play.
Prerequisites: E, R

204 MASTERPIECES OF BRITISH LITERATURE II
EVEN YEARS **3 (3-0)**
Study of British literature of the Romantic, Victorian and Modern eras from 1750 to the present. Representative authors' works are read and evaluated to understand background and impact, characteristics and aesthetic value and how they represent their times.
Prerequisites: E, R

205 INTRODUCTION TO SHAKESPEARE
SPRING **3 (3-0)**
Shakespeare's greatest plays and a selection of his sonnets are read intensively and discussed. The universality of Shakespeare's thought will be emphasized, as will the qualities that make his work applicable to the modern day. For instance, characterization will be stressed more than plot. The course will lead to a greater understanding and appreciation of Shakespeare's writing.
Prerequisites: E, R

206 MODERN DRAMA SPRING **3 (3-0)**
Contemporary dramatic writing by reading modern plays representative of various countries, such as Russia, France, South Africa and Norway as well as England and America. Also, examples of chief dramatic types that have flourished from Ibsen to present day: realism, naturalism, symbolism and expressionism. Develops appreciation of drama and theatre.
Prerequisites: E, R

208 LITERARY INTERPRETATION
FALL, SPRING **3 (3-0)**
Study of literature to develop sensitivity and skill in critical interpretation of poetry, drama and prose fiction. Includes characteristics of different literary genre, their analysis and increased reading and interpretation skills.
Prerequisites: E, R

209 AMERICAN NOVEL FALL **3 (3-0)**
Major American novels since 1850 in terms of setting, characterization, plot, tone, point of view, theme, imagery, symbolism and style. Social, historical, psychological and intellectual significance of works are considered. Novels studied include selection of works by authors from 1850 to the present.
Prerequisites: E, R

210 AMERICAN LITERATURE TO 1865
FALL **3 (3-0)**
Survey of literature of pre-American revolution texts to the Civil War. Emphasis on disclosure of liberty and conquest, and the development of an American voice. Examines American literature in terms of cultural, historical and intellectual roots. Emphasis on the issues of race, gender and class along with the study of writings that reflect major literary and social movements.
Prerequisites: E, R

211 AMERICAN LITERATURE 1865 TO PRESENT
SPRING **3 (3-0)**
A study of major elements of American literature from the Civil War to the present. Emphasis on origins and nature of modern literature. Examines American literature of period in terms of cultural, historical and intellectual roots. Study of writings which reflect major literary and social movements.
Prerequisites: E, R

214 CHILDREN'S LITERATURE
FALL, SPRING 3 (3-0)
Folk and fairy tales, poetry, mythology, realistic fiction and minority group literature appropriate for children. Emphasis on selection and presentation of literature appropriate for children of preschool age through junior high level.
Prerequisites: E, R, ENGL 101

215 POETRY ON DEMAND 3 (3-0)
Appreciation and understanding of poetry. Study of important aspects of the poem: images, figures, symbols, rhythm, sound and tone. Emphasis on twentieth-century poetry. Recommended for English majors.
Prerequisites: E, R

216 LITERATURE OF BLACK AMERICA
SPRING 3 (3-0)
Fiction and non-fiction literary works by black American authors (narratives, short stories, essays, poems, speeches, memoirs, plays and novels). These works, from the heritage of black Americans, are part of American literary heritage. Course will feature a thematic or special topic selection of works by a variety of recognized authors.
Prerequisites: E, R

217 CREATIVE WRITING FALL, SPRING 3 (3-0)
Imaginative writing, i.e., writing of original poetry, fiction, drama and creative non-fiction (memoir). Study and application of specific techniques in each genre. Conducted on workshop basis. Students expected to produce a portfolio of finished pieces in the four genres.
Prerequisites: E, R

ENOLOGY (ENOL)

101 INTRODUCTION TO ENOLOGY AND VITICULTURE
FALL 3 (3-0)
An overview of wine production and the wine business, presented with the goal of providing background information and knowledge necessary to make career decisions. Students will also investigate the issues surrounding workplace health and safety.

105 WINES OF THE WORLD & SENSORY ANALYSIS
FALL 3 (2-2)
This course is an introduction and overview of major wine making regions of the world; focus will be on grape varietals, geographic considerations, climate, vineyard practices and key laws governing wine production and labeling. A history of the Southwest Michigan wine region is included. Students will begin to develop sensory skills through guided tastings.
Prerequisites: E, R

190 ENOLOGY CO-OP I FALL 1 (1-15)
This work-based learning course consists of participation in harvest and crush operations at the Lake Michigan College teaching winery, or other approved facility.
Prerequisites: E, M, R

191 ENOLOGY CO-OP II, SUMMER 1 (1-50)
This work-based course offers hands-on learning while working at a selected winery and receiving supervision from a professional winemaker. Permission of the Director of Wine and Viticulture Technology required. Work site and work site hours may vary.
Prerequisites: E, M, R, ENOL 190

210 WINE ANALYSIS AND QUALITY CONTROL
FALL FEE 4 (3-2)
This is an advanced enology course. Students will develop an understanding of wine chemistry and the concepts and methods of wine chemical analysis.
Prerequisites: E, M, R, AGRI 110 or CHEM 104 and ENOL 101

211 WINEMAKING AND FERMENTATION
SUMMER FEE 3 (3 - 0)
This is the second course in a series open only to students enrolled in the Wine and Viticulture Technology program. This course emphasizes the microbiology of winemaking and fermentation management. Students will continue to learn about wine composition, wine analytical techniques and the relevance of these analyses in winemaking decisions. Additional topics include wine processing equipment, wine/juice additives and winery sanitation.
Prerequisites: E, M, R, ENOL 101 and ENOL 210

220 WINERY OPERATIONS MANAGEMENT
SUMMER 3 (3-0)
This course provides an overview of winery management and operations. Topics include legal compliance and record keeping, supply and inventory control, and distribution. Wine marketing is covered at length. The issues surrounding wine production and sales that are unique to Southwest Michigan are investigated. Guest lecturers will be invited to offer relevant presentations during the semester.
Prerequisites: E, M, R, ENOL 101

290 ENOLOGY CO-OP II FALL 3 (3-45)
This work-based course offers hands on learning while participating in harvest activities at a selected winery and receiving supervision from a professional vintner. Permission of Wine and Viticulture Technology lead faculty is required.
Prerequisites: E, M, R, ENOL 190

FOREIGN LANGUAGE (FORL)

101 ELEMENTARY FRENCH I FALL 4 (4-0)
For students with limited background in modern foreign languages. Basic grammatical principles, elementary conversation, simple writing and dictation, some discussion of culture and geography of France. Additional work with tapes or cassettes is required.
Prerequisites: E, R

102 ELEMENTARY FRENCH II SPRING 4 (4-0)
Continuation of FORL 101. Basic grammatical principles; conversation of more advanced level, continued writing, dictation and cultural study. Continued use of tapes or cassettes required.
Prerequisite:s E, R, FORL 101

121 ELEMENTARY SPANISH I FALL 4 (4-0)
For students with limited or no background in modern foreign languages. Basic grammatical principles, elementary conversation and simple writing. Some additional work with tapes or cassettes. Culture and geography of Spanish-speaking countries.
Prerequisite: E, R

122 ELEMENTARY SPANISH II SPRING 4 (4-0)
Continuation of FORL 121. Study of basic grammatical principles is completed with continued conversation, writing, dictation and cultural study. Continued audio work required. Successful completion of at least one year high school Spanish with a C or better.
Prerequisites: E, R, FORL 121 with a C or better.

123 SPANISH FOR THE WORKPLACE I
FALL, SPRING 4 (4-0)
This course offers an introduction to the Spanish language with particular emphasis on applying acquired knowledge within the realm of the workplace.

124 SPANISH FOR THE WORKPLACE II
FALL, SPRING 4 (3-1)
This course is a continuation of basic Spanish with particular emphasis on applying acquired knowledge within the realm of the workplace.
Prerequisites: FORL 123 or two years of high school Spanish or one year of College Spanish or permission of the instructor.

181 ELEMENTARY RUSSIAN I 4 (4-2)
Courses concentrate on functional communication with emphasis on outcome-based goals such as being able to speak in basic sentence patterns, ask questions, engage in telephone conversations, make requests, give orders, etc., in situational introductions of reality. Communication is emphasized; grammar is introduced to support this process.
Prerequisites: E, R

182 ELEMENTARY RUSSIAN II 4 (4-2)
Courses concentrate on functional communication with emphasis on outcome-based goals such as being able to speak in basic sentence patterns, ask questions, engage in telephone conversations, make requests, give orders, etc., in situational introductions of reality. Communication is emphasized; grammar is introduced to support this process.
Prerequisites: E, R, FORL 181

188 ELEMENTARY JAPANESE I 4 (2-2)
Courses concentrate on functional communication with emphasis on outcome-based goals such as being able to speak in basic sentence patterns, ask questions, engage in telephone conversations, make requests, give orders, etc., in situational introductions of reality. Communication is emphasized; grammar is introduced to support this process.
Prerequisites: E, R

189 ELEMENTARY JAPANESE II 4 (2-2)
Courses concentrate on functional communication with emphasis on outcome-based goals such as being able to speak in basic sentence patterns, ask questions, engage in telephone conversations, make requests, give orders, etc., in situational introductions of reality. Communication is emphasized; grammar is introduced to support this process.
Prerequisites: E, R, FORL188

195 ELEMENTARY ITALIAN I 4 (2-2)
Courses concentrate on functional communication with emphasis on outcome-based goals such as being able to speak in basic sentence patterns, ask questions, engage in telephone conversations, make requests, give orders, etc., in situational introductions of reality. Communication is emphasized; grammar is introduced to support this process.
Prerequisites: E, R

196 ELEMENTARY ITALIAN II 4 (2-2)
Courses concentrate on functional communication with emphasis on outcome-based goals such as being able to speak in basic sentence patterns, ask questions, engage in telephone conversations, make requests, give orders, etc., in situational introductions of reality. Communication is emphasized; grammar is introduced to support this process.
Prerequisites: E, R, FORL195

221 INTERMEDIATE SPANISH I FALL 4 (4-0)
Review of basic grammatical functions, more detailed writing and advanced composition. Reading of selections from Spanish authors. Classes may be conducted in Spanish.
Prerequisites: E, R, FORL 122 or successful completion of at least two years high school Spanish

222 INTERMEDIATE SPANISH II SPRING 4 (4-0)
Continuation of FORL 221. Emphasizes ability to speak, read and write in Spanish.
Prerequisites: E, R, FORL 221

251 ADVANCED ORAL AND WRITTEN SPANISH
ON DEMAND 3 (3-0)
Concentration on improvement in written and oral expression in Spanish based on selected readings in modern Spanish literature. Lectures, discussion, resumes, student presentations and short papers in Spanish, with extensive and intensive reading assignments. Classes conducted in Spanish.
Prerequisites: E, R, FORL 222 or equivalent

GEOGRAPHY (GEOG)

101 HUMAN GEOGRAPHY SPRING 4 (4-0)
Broad approach to human geography that deals with fundamental relationship of humans to land and why people live where they do and as they do. Proposes that each society interprets earth and humans from the viewpoint of its particular culture. Cultural factors studied with examples from modern societies.
Prerequisites: E, R

102 ELEMENTS OF PHYSICAL GEOGRAPHY FALL, SPRING 4 (3-2)
Includes study of planetary relations, atmosphere, air masses, climates, water resources, landforms, soils and vegetation. Demonstrates the basic relationship among these topics. Impact of human activities on environment emphasized. Laboratory work integral to course and used to reinforce important topics.
Prerequisites: E, R

GRAPHIC DESIGN (GRDN)

101 DIGITAL STUDIO I FALL, SPRING 3 (2-4)
This course focuses on developing the skills necessary for producing print-ready communications: graphic design principles, visual comps, print production development, and project management skills (e.g. interviewing and scheduling, peer review and revision). Project activities focus on developing effective communications that can be deployed in print, on the web, or in a video. Students develop a variety of graphics, a logo, a business card and a client advertisement. Students produce supporting design documents and visual comps that clients review. The semester culminates with a portfolio project during which students reflect on the skills and topics covered thus far and begin to explore the career areas that interest them in design.
Prerequisites: E, M, R

110 INTRODUCTION TO GRAPHIC DESIGN FALL, SPRING FEE 3 (2-4)
This course investigates the graphic design profession. Students engage in simulation of client pitches, participate in group critiques and brainstorming sessions, create design briefs, thumbnail sketches, mood boards and "comps." Conceptual design and client research is emphasized. Students evaluate their career goals through readings and discussion on design specialties and schools.
Prerequisites: E, R

130 PHOTOGRAPHY I FALL, SPRING FEE 3 (2-4)
Beginning with a basic introduction to black and white photography using chemical methods, the class will then move into digital techniques. Upon completion of this class, students will have a basic knowledge of the chemical darkroom; software for archiving, altering and storage of digital images; the camera; light metering, lighting, and flash use; as well as in-camera, darkroom and digital image manipulation. This course is a foundation course in the creation, use and selection of images for advertising and design.
Prerequisites: E, M, R

131 PHOTOGRAPHY II SUMMER FEE 3 (2-4)
Students explore the materials, techniques, processes and ideas of advanced experimental photography using film (Silverprints, infrared, photo silk screen) advanced lighting and digital techniques (complex image manipulation, working across multiple programs and media). Previous relevant experience can serve as course prerequisites with permission of the instructor.
Prerequisites: E, M, R, GRDN 101 Digital Studio with a C or better and GRDN 130 Photography I with a C or better

140 PRODUCTION SKILLS FOR GRAPHIC DESIGN SPRING FEE 3 (2-4)
This course emphasizes the practice of functional design by developing the student's knowledge of the production processes in graphic media. Designing a message to work efficiently within the production process and on budget while employing original thought.
Prerequisites: E, R, GRDN 101, GRDN 110 or instructor's consent

200 PRINCIPLES OF TYPOGRAPHY FALL FEE 3 (2-4)
This course is an introductory study to the typographic arts from the invention of writing to the advent of the computer age. It infuses an understanding of the historical and sociological pressures driving the development of written language with practical exercises. Emphasis will be placed initially on understanding type as an abstract design element. Once mastered, this principle will be used to communicate more complex ideas and compositions in real-world applications. Previous relevant experience can serve as course prerequisites with permission of the instructor.
Prerequisites: E, M, R, GRDN 101 with a C or better and ART 109 with a C or better

201 TYPOGRAPHY II SPRING FEE 3 (2-4)
This course is a continuing study of the typographic arts in the twentieth century and the information age. Emphasis will be placed on the use of type in professional communication, the grid system, information design, international typographic style, type used in digital and other media and the contribution of graphic design as a language for social reform.
Prerequisites: E, R, GRDN 101, GRDN 110, GRDN 200, ART109 or instructor's consent

220 Digital Studio II SPRING FEE 3 (2-4)
This class builds on the design and development skills of Digital Studio I by focusing on longer projects as well as more in-depth content and advanced computer techniques. Students continue to work in teams producing communications such as brochures, newsletters and annual reports. They develop graphic and print production skills that solve specific communication challenges for clients and audiences. They build technical skills to address project needs and track complex projects. The class culminates with a portfolio redesign using the students themselves as the client and their next step as designers determining the audience. Although not required, it is suggested students complete or take concurrently GDRN 130 and GDRN 200. Previous relevant experience can serve as course prerequisites with permission of the instructor.
Prerequisites: E, M, R, GRDN 101 Digital Studio I with a C or better and ART 109 Basic Design I with a C or better.

HEALTH (HEAL)

101 INTRODUCTION TO ALLIED HEALTHCARE CAREERS
SPRING 1(1-0)
This course provides an overview of the evolving healthcare system in the United States and introduces students to a variety of allied healthcare occupations, including the expectations and demands of each.
Prerequisites: E, R

103 MEDICAL TERMINOLOGY SPRING 2(2-0)
This course will provide the basic terminology required for healthcare professionals. Students will cover the basic structure of medical terms, including prefixes, suffixes, combining forms and plurals as they pertain to various body systems. By the end of the course, students will have a working knowledge of medical vocabulary.
Prerequisite: R

113 NUTRITION AND DIET THERAPY
FALL, SPRING, SUMMER 3 (3-0)
Basic principles of human nutrition including nutrients and allowances for various ages and normal conditions. Use of diet therapy in disease and abnormal conditions. Course directed to students interested in health-related professions including nursing and dietetics.
Prerequisites: E, M, R

120 HEALTH AND HEALTH OCCUPATIONS
FALL, SPRING 2(2-0)
This course provides an overview of the healthcare field for students interested in health or health careers. General background given in many health areas: anatomy, nutrition, vital signs and infection control are examples. A health careers overview is an integral part of the course with opportunities to research many different occupations in health care career fields. Students completing this course will have a good background for study of any health occupation and will be knowledgeable about what these occupations entail.

130 PHLEBOTOMY TECHNICIAN
FALL, SPRING, SUMMER FEE 5 (3-4)
This course prepares students for employment as a phlebotomy technician in clinical laboratories. Students will learn law and ethics for phlebotomists, infection control standards and safety guidelines, specimen collection techniques, and quality assurance methods. This course requires the completion of a minimum of 100 hours of supervised clinical practice in addition to classroom lectures and lab demonstrations. Upon successful completion of this course and clinical practice, students will be eligible to sit for the National Healthcareer Association certification exam.
Co-requisites: HEAL 101, HEAL 103, and BIOL 110

HISTORY (HIST)

101 HISTORY OF WESTERN CIVILIZATION I
FALL 4 (4-0)
Explores evolution of Western cultural heritage from roots in the ancient world to the Italian Renaissance. Examines character and achievements of ancient civilizations of Mesopotamia, Egypt, Greece and Rome. Traces the rise and spread of great Western religions- Judaism, Christianity and Islam. Concludes with analysis of essential features of early and late medieval civilization, and changes wrought in European society by the Renaissance.
Prerequisites: E, R

102 HISTORY OF WESTERN CIVILIZATION II
SPRING 4 (4-0)
Examines developments in the European world from 1500 to 1920. Begins with analysis of forces that shaped early modern society: Protestant Reformation, commercial revolution, rise of absolute monarchies and nation states and the scientific and intellectual revolution of 17th and 18th centuries. Explores the impact of two upheavals; The French Revolution and Industrial Revolution, on events and ideologies of 19th century. Among topics considered are growth of liberalism, socialism, Marxism, nationalism and scientific secularism and their social and political consequences. The study of causes and effects of World War I.
Prerequisites: E, R

201 AMERICAN HISTORY FALL, SPRING 3 (3-0)
United States history from the colonial period through Reconstruction. Topics include the process and problems of colonization, difficulties encountered in developing workable political structure, the process of democratization, socio-economic change, territorial expansion, rivalries leading to Civil War and the impact of the war. Special attention is paid to the modern legacy from America's past.
Prerequisites: E, R

202 AMERICAN HISTORY FALL, SPRING 3 (3-0)
United States history from Reconstruction to the present. Topics include conquest of the West, industrialization and its impact, various movements to reform America and the increasingly important role this country plays in the international community. Special attention is paid to the modern legacy from America's past.
Prerequisites: E, R

204 MODERN EAST ASIA FALL 3 (3-0)
Explores traditional cultures of China and Japan, their interaction with the West in the 19th and 20th centuries, and contemporary events and conditions in both nations. Examines how traditional political systems, social structures, economic systems and religions and philosophies were progressively modified under the impact of modernization but continue to influence contemporary culture. Studies the effects of Western encroachment on East-West relations in the modern period, and features the evolution of Communist China and Japan's imperialist experiment.
Prerequisites: E, R

205 AFRICAN AMERICAN HISTORY 3 (3-0)
Reviews theories surrounding the early presence of black Africans in Ancient America. Presents an overview of the developments that led to the African slave trade and slave systems in North and South America. The challenges, contributions and culture of African Americans in North America from pre-Revolution to post-World War I are included.
Prerequisites: E, R

208 NON-WESTERN WORLD: LATIN AMERICA
ON DEMAND 3 (3-0)
Latin America's history from its pre-Columbian roots to contemporary patterns. Topics include: Colonial Era discoveries, conquests and traits of Spanish colonization. Problems common to Latin American republics including, social and economic inequalities, recurrent revolutions and relations between U.S. and the Hispanic world.
Prerequisites: E, R

209 WOMEN IN THE WESTERN WORLD
SPRING 3 (3-0)
Examines the experience of women in selected samples of Western cultures from the ancient world to modern times. Explores how societies create and modify definitions of gender-appropriate roles and behavior. Investigates how definitions affect women as family members, workers and participants in society. Analyzes how women respond historically to challenges and constraints of their lives and what insights, past experiences and modern feminist theory offer for an understanding in the present.
Prerequisites: E, R

210 THE CIVIL WAR AND RECONSTRUCTION
SPRING 3 (3-0)
The history of the United States Civil War and Reconstruction period. Topics include the causes of the war, slavery, military history, major battles, the impact of the war on slavery, the politics of Reconstruction and the promise and problems of a biracial South. Special attention is paid to the legacy from the Civil War and Reconstruction on 21st-century America
Prerequisites: E, R

HONORS (HONR)

101 HONORS BIOLOGICAL SCIENCE FALL 4 (3-2)
Introduction to basic principles and concepts of biology as well as related laboratory experiences. Areas of emphasis include ecology, evolution, unity and diversity of life, organ systems, genetics, cell biology and behavior. NOTE: Students with two (2) or more years of high school biology should take BIOL 111, BIOL 112 or BIOL 204.
Prerequisites: E, R

111 HONORS PRINCIPLES OF BIOLOGY I
FALL FEE 4 (3-2)
Emphasizes molecular biology, cell chemistry, cell structure and function, physiology, growth and development and genetics. For Biology majors and minors, or students planning to transfer to pre-professional programs requiring Biology. Includes a three-hour laboratory experience per week. NOTE: Students with two years of high school biology, or one year of high school biology and one year of chemistry will serve as BIOL101 prerequisite.
Prerequisites: E, M, R, BIOL 101 (or recommend 2 years of high school biology, or one year of high school biology and one year of chemistry).

112 HONORS PRINCIPLES OF BIOLOGY II
SPRING FEE 4 (3-3)
Emphasizes diversity of organisms, animal and plant structure, animal behavior and ecology. For Biology majors and minors, or those students planning to transfer to pre-professional programs requiring Biology. Includes a three-hour laboratory experience per week. Students with two years of high school biology, or one year of high school biology and one year of chemistry will serve as BIOL 101 prerequisite.
Prerequisites: E, M, R, BIOL 101 or HONR 101 with a C or better

120 HONORS ELEMENTARY SPANISH I
FALL 4 (4- 0)
This course is designed for students with limited or no background in modern foreign languages. Basic grammatical principles, elementary conversation and simple writing. Some additional work with tapes or cassettes. Culture and geography of Spanish-speaking countries.
Prerequisites: E, R

121 HONORS INTRODUCTION TO PSYCHOLOGY
FALL 3(3-0)
Description, understanding and control of human behavior. Two-fold aims: to increase student ability to understand self and others and make more satisfactory adjustments to life and introduction to the field of Psychology.
Prerequisites: E, R

122 HONORS ELEMENTARY SPANISH II
SPRING 4 (4-0)
Elementary Spanish II is a continuation of Elementary Spanish I, FORL 121. The study of basic grammatical principles is completed and continued in conversation, writing, dictation and cultural study.
Prerequisites: E, R, FORL 121

130 HONORS PRINCIPLES OF SOCIOLOGY
SPRING 3(3-0)
The study of socio-cultural, economic and physical aspects of aging in the United States and other societies with an emphasis on the diversity of the aging process.
Prerequisites: E, R

141 HONORS NATIONAL GOVERNMENT
FALL, SPRING 3 (3-0)
The structure and operation of national government, the meaning and practice of democracy, power relationships, civil rights and liberties and the American method of conducting elections, also the role of citizens and their choices.
Pre-requisites: E, R

143 HONORS STATE GOVERNMENT
FALL, SPRING 3 (3-0)
Examines political decision-making and public policies of state governments, with particular emphasis on Michigan. Analyzes both the relationships of states with the national government as well as each other and contrasts policies and political structures in each state.
Prerequisites: E, R

150 HONORS CALCULUS I FALL 1 (1-0)
These one-hour Honors Credit courses are open only to those students who have been admitted to the Honors Program. These courses offer additional challenges in the form of lab, or field, or library research or enrichment activities that usually are not part of the regular courses. The student and the instructor agree upon a particular program of study for the semester at the beginning of the semester. To be registered in these additional honors credit courses, the student must either have already successfully completed the regular course or must be concurrently registered in the corresponding regular course. A variety of honors credit courses will be offered each FALL semester.
Prerequisites: Concurrent enrollment in MATH151 or previous successful completion of MATH151. R, MATH128 and MATH130 with a C or better, or MATH135 with C or better or associated placement scores(s).

171 HONORS INTRODUCTION TO PHILOSOPHY
FALL, SPRING 3 (3-0)
The nature of Philosophy by consideration of major types of philosophical questions, such as: principles of rational belief, the existence of God, pursuit of a good life, the nature of knowledge, the problem of truth and verification and relationship of people to state. Establishes frames of reference so students can begin asking philosophical questions.
Prerequisites: E, R

175 HONORS INTRODUCTION TO LOGIC
FALL, SPRING 3 (3-0)
Students will explore the ways in which people reason and come to conclusions. Course activities are designed to help students understand and evaluate others' arguments. Students will learn methods for testing the reliability of their own reasoning as well as strategies for constructing sound arguments.
Prerequisites: E, R

195 HONORS ELEMENTARY ITALIAN I FEE 4 (4-0)
A National Association for Self-Instructional Language Program course addressing the needs of the beginning student in Italian. Course concentrates on functional communication. Emphasis is on outcome-based goals, such as being able to speak in basic sentence patterns, ask questions, engage in telephone conversations, make requests, give orders, etc., in situational introductions of reality. Communication is emphasized; grammar is introduced to support this process.
Prerequisites: E, R

196 HONORS ELEMENTARY ITALIAN II FEE 4 (4-0)
A National Association for Self-Instructional Language Program courses addressing the needs of beginning students in various languages. Course concentrates on functional communication. Emphasis on outcome-based goals, such as being able to speak in basic sentence patterns, ask questions, engage in telephone conversations, make requests, give orders, etc., in situational introductions of reality. Communication is emphasized; grammar is introduced to support this process.
Prerequisites: E, R, FORL 195

203 HONORS HUMAN DEVELOPMENT
FALL, SPRING 3 (3-0)
Physical, cognitive, social and emotional development from conception through death. Emphasis upon factors influencing development of personality.
Prerequisites: E, R, PSYC 201 or HONR 121 with a C or better.

204 HONORS MASTERPIECES OF ENGLISH LITERATURE II FALL, SPRING 3 (3-0)
Study of English literature of the Romantic, Victorian and Modern eras from 1750 to the present. Representative authors' works read and evaluated to understand background and impact, characteristics and aesthetic values and how they represent their times.
Prerequisites: E, R

208 HONORS AMERICAN NOVEL
FALL, SPRING 3 (3-0)
Major American novels since 1850 in terms of setting, characterization, plot, tone, point of view, theme, imagery, symbolism and style. Social, historical, psychological and intellectual significance of works are considered. Novels studied include selection of works by authors from 1850 to present.
Prerequisites: E, R

209 HONORS SOCIOLOGY OF AGING
SPRING 3 (3-0)
The study of socio-cultural, economic and physical aspects of aging in the United States and other societies with an emphasis on the diversity of the aging process.
Prerequisites: E, R

214 HONORS AMERICAN HISTORY
FALL, SPRING 3 (3-0)
United States history from colonial period through Civil War. Topics include process and problems of colonization, factors promoting independence, difficulties encountered in developing workable political structure, process of democratization, socio-economic change, territorial expansion and rivalries leading to civil war. Special attention paid to the modern legacy from America's past.
Prerequisites: E, R

215 HONORS AMERICAN HISTORY
FALL, SPRING 3 (3-0)
United States history from Civil War to present. Topics include Reconstruction, conquest of the West, industrialization and its impact, various movements to reform America and the increasingly important role this country plays in the international community. Special attention paid to the modern legacy from America's past.
Prerequisites: E, R

231 HONORS ABNORMAL PSYCHOLOGY
FALL, SPRING 3 (3-0)
Descriptions of cognitive, affective and behavioral disorders. Origins of specific disorders considered along with nature and problem of diagnosis and classification and contemporary modes of treatment.
Prerequisites: E, R, PSYC 201 with a C or better

241 HONORS COLLOQUIUM
FALL, SPRING 1 (1-0)
The Honors Colloquium, offered every FALL and SPRING semester, involves an intensive study/research on a topic for that year to go along with the theme(s) of the public lectures for that year. All honors students are required to register for the Colloquium every semester they are in the Program. The Colloquium topic will be announced each year. The Colloquium incorporates open discussion of the main theme and mutual criticism and the study/research projects related to the main theme being done by the participants. The Colloquium includes attendance at the public lectures and discussion with these lecturers.

250 HONORS ENGLISH COMPOSITION I 3 (3-0)
This course in the two semester English sequence focuses on expository writing and the closely related activities of critical reading and thinking. Primary attention is to be given to the formal elements of short essays based upon or incorporating documented source material.
Prerequisite: E

251 HONORS ENGLISH COMPOSITION II 3 (3-0)
Extension and intensification of elements writing and critical thinking covered in HONR250. Particular emphasis given to formal, stylistic and rhetorical consideration and techniques involved in developing longer critical essays that incorporate documented evidence from a broad range of source material.
Prerequisites: ENGL 101 or HONR 241

256 HONORS CREATIVE WRITING
FALL, SPRING 3 (3-0)
Imaginative writing, i.e., writing in original poetry, fiction, drama and creative non-fiction (memoir). Study and application of specific techniques in each genre. Conducted on a workshop basis. Students are expected to produce a portfolio of finished pieces in four genres.
Prerequisites: E, R

258 HONORS LITERARY INTERPRETATION
SPRING 3 (3-0)
Study of literature to develop sensitivity and skill in critical interpretation of poetry, drama and prose fiction. Includes characteristics of different literary genres, their analysis and increased reading and interpretation skills.
Prerequisites: E, R, HONR 250 or ENGL 101

HOSPITALITY (HOSP)

110 SANITATION FALL, SPRING 1 (1-0)
Sanitation policies necessary to effectively operate a commercial food service facility. Students successful in the course will receive Educational Foundation of National Restaurant Association Certification in Applied Food Service Sanitation and Michigan State Certification.

111 RESPONSIBLE BEVERAGE SERVICE
FALL, SPRING 1 (1-0)
This class explores the service policies and practices necessary to effectively serve alcohol in a hospitality establishment. Upon successful completion, students will receive ServSafe Certification in Applied Alcohol Service Training.

115 SAFETY AND LEGAL OVERVIEW FALL 3 (3-0)
Course provides awareness of rights and responsibilities that law grants or imposes in the hospitality industry.
Prerequisites: E, R

117 INTRODUCTION TO MEETINGS AND EVENTS
SPRING 3 (3-0)
Overview of the planning and implementation of meetings and events that includes types of meetings and events, site selection, marketing, media technology, food and beverage, budget, reservations and evaluation.

120 PROFESSIONAL COOKING I FEE 2 (1-3)
This course is designed to give the student an introduction to the professional kitchen and preparation techniques. The student will gain competency in knife skills; food safety practices; fiber component of vegetables; selection and USDA grades of meat, poultry and seafood and their composition, structure and classification; factors affecting tenderness; storage; and cooking techniques.

130 TABLE SERVICE 3 (3-0)
This course introduces the student to modern food and beverage service. Classroom lectures focus on the basic beverage techniques, service language and equipment used in modern buffet service. Sanitation, safety, personal hygiene and grooming are emphasized. Table arrangements and setups are taught along with organization and responsibilities of staff within the dining room. Proper dress and service techniques are emphasized.

150 INTRODUCTION TO HOSPITALITY CAREERS
FALL, SPRING 3 (3-0)
Covers career opportunities in restaurants, hotels, institutional feeding, travel and tourism, and hospitality management for those considering the hospitality industry as a career.

153 NUTRITION FALL 3 (3-0)
Characteristics, functions and major nutrient groups and how to maximize nutrient retention in food preparation and storage. Students learn nutrient needs through life cycles and apply principles to menu planning and food preparation.
Prerequisites: E, R

200 HOSPITALITY MANAGEMENT INTERNSHIP
FALL, SPRING, SUMMER 3 (1-8)
Supervised work experience integrates academic study with hospitality industry experience in hotel/motel or restaurant work site. Students work 120 hours at assigned hospitality management sites and complete 15 hours of campus class time.
Prerequisites: E, M, R, HOSP 110, HOSP 115, HOSP 150, HOSP 252, students must meet with coordinator prior to enrollment

201 RESTAURANT OPERATIONS SPRING 3 (3-0)
Overview of restaurant operations that includes menus, cost control, financial operations, training, staffing, equipment and product purchasing, marketing, regulations, sanitation and customer service.
Prerequisites: E, M, R

202 INTRODUCTION TO CASINO MANAGEMENT 3 (3-0)
This course provides an overview of casino operations and management. Topics include: gaming trends in the United States, government regulations, staffing, credit, security, marketing, entertainment and casino games.
Prerequisites: E, M, R

220 PROFESSIONAL COOKING II FEE 2 (1-3)
This course reinforces knowledge and skills developed in Introduction to Professional Cookery and helps the student build confidence in techniques of advanced cookery while cooking from menus that exemplify American and regional cuisines. Students participate in food preparation at an advanced level, and attention is given to portion control, plate presentation and team work.
Prerequisites: E, M, R, HOSP 120 with a C or better

250 FOOD PREPARATION SKILLS SPRING 2 (0-4)
Proficiency in tool, equipment usage, standardized recipes found in a commercial kitchen and learn to insure a high level of guest satisfaction. Emphasis on soup, sauces, entrees, salads, fruits and vegetables.
Prerequisites: M, R

251 MARKETING OF HOSPITALITY SERVICES FALL 3 (3-0)
Marketing mix related to hospitality service sector. Students learn why marketing is a hot topic in the hospitality industry. Implementation of marketing concepts in a competitive climate in the hospitality industry is essential to a successful student.
Prerequisites: E, M, R

252 SUPERVISORY SKILLS AND HUMAN RELATIONS FALL 3 (3-0)
Prepares students for transition from employee to supervisor. Students evaluate styles of leadership and develop effective skills in human relations and personnel management.
Prerequisites: E, R

253 TOURISM SPRING 3 (3-0)
Understanding of tourism, its nature, history and organization. Topics include cultural aspects, sociology, psychology and motivation, economics, forecasting demand, consumers, research, and planning and development for tourism industry.
Prerequisites: E, M, R

254 HOSPITALITY COST CONTROL SYSTEMS SPRING 3 (3-0)
Capstone course in financial control for hospitality student. Areas covered include room, food and beverage control systems, operating budget, income and cost control, menu pricing and practical application.
Prerequisites: E, M, R, HOSP 150

255 HOTEL MANAGEMENT AND OPERATIONS FALL 3 (3-0)
Provides knowledge of the management of flow of operations to all hotel departments. Includes finance, front office, housekeeping, maintenance, marketing, engineering, information management, security, and food and beverage. Utilizes real-world case studies that correlate management problems with problem solving techniques.
Prerequisites: E, M, R

275 BEVERAGE MANAGEMENT FALL 3 (3-0)
Overview of beverage management that includes menus, cost control, financial operations, training, staffing, equipment and product purchasing, guest service, marketing, mixology, regulations, sanitation and beverage service.
Prerequisites: E, M, R

280 GARDE MANGER FEE 2 (1-3)
This course provides the student with a foundation in garde manger including history, ingredients, procedures, culinary terms and equipment. Emphasis is placed on eye appeal, texture, color contrast, artistic touch, harmony of combinations, and taste, as well as the processing, production and storage of ingredients. Ice carvings, salt dough pieces and mirrors for buffets may be used, and professional competition skills are presented. Speed, timing and teamwork are emphasized in this course.
Prerequisites: E, M, R, HOSP 120 with a grade of C or better

285 FUNDAMENTALS OF BAKING FALL 2 (0-4)
This course helps the student build confidence in techniques of baking from menus that exemplify American and regional pastries. Students participate in baking at a beginning level, and attention is given to portion control, presentation and team work.
Prerequisites: E, M, R

HUMANITIES (HUMN)

105 AWARENESS OF THE FINE ARTS 1 (1-0)
Interdisciplinary study to develop awareness of interrelationships of various fine arts and investigate impact upon contemporary society from variety of perspectives. Various methods of instruction used, including independent reading or research, lecture and discussion, projects associated with field trip, or travel of recognizable educational value. If trip is major thrust of course, includes pre-trip preparation with readings, videos and written assignments and post-trip evaluation such as written assignment, journal or test.

201 INTRODUCTION TO THE ARTS 3 (3-0)
This cross-disciplinary course is intended to enhance individual critical sensibility and responsiveness to the arts. This course consists of two complimentary components: the first, an introductory survey of influential theories on criticism and on the nature of art; and the second, a survey of the distinguishing formal characteristics of major artistic media.
Prerequisites: E, R

207 INTRODUCTION TO STORY AND MEDIA
FALL 3 (3-0)
Explores how nature and substance of stories humankind has used to express and define values have been shaped by various written and visual media used to communicate insights.
Prerequisites: E, R

208 INTERPRETING FILM AND FICTION
FALL 3 (3-0)
Approaches to find and test meanings in films, short fiction, novels and plays. Particular works in media considered in terms of critical literacies each requires.
Prerequisites: E, R

209 INTRODUCTION TO THE ART OF CINEMA
FALL 3 (3-0)
The social, cultural and artistic nature and significance of motion pictures, in addition to critical exploration of current films, touch-stone films used to document historical development of cinematic techniques and genres.
Prerequisites: E, R

210 ARTS IN THE MODERN WORLD FALL 3 (3-0)
Team-taught, cross-disciplinary introduction to major concepts, media and arts that both shape and reflect modern and post-modern culture.
Prerequisites: E, R

211 STUDIES IN FILM ART SPRING 3 (3-0)
Critical exploration of general concepts of genre, style, theme and technique of related films. Specific focus and films varies each semester, with emphasis indicated in class schedule.
Prerequisites: E, R, HUMN 209 or consent of instructor

212 ARTS AND IDEAS I FALL 3 (3-0)
Survey of literature and philosophical works that form Western cultural heritage. Works representative of attitudes and artistic expression of major cultural periods examined for what they reveal about values of their cultures and relevance to life in 20th century. Contributions of these cultural periods considered: early Judeo-Christian religious thought and experience; philosophical insights and literary traditions of classical Greece and Rome; medieval synthesis of classical attitudes and Christianity; and culmination of these attitudes in Renaissance Humanism.
Prerequisites: E, R

213 ARTS AND IDEAS II SPRING 3 (3-0)
Continuation of HUMN212 which is not prerequisite. Contributions of these cultural periods considered: Enlightenment, Romanticism, modern and contemporary times.
Prerequisites: E, R

221 PORTRAITS OF THE ARTIST SPRING 3 (3-0)
Major concepts that define artists in terms of unique identities, social roles and responsibilities to contemporary audiences and posterity.
Prerequisites: E, R

294 FIELD EXPERIENCE IN THE FINE ARTS 3 (3-0)
Travel course of interdisciplinary nature where the world of theatre, music, dance and visual arts are explored in a metropolitan setting. Course may visit literary sites and participate in multicultural and international activities. Students assigned pre-trip readings, videos and written assignments; may complete trip journal; and have post-trip written assignment, test or other means of evaluation.

INDUSTRIAL MAINTENANCE TECHNOLOGY (INMT)

109 INTRO TO WELDING FALL, SPRING 2 (1-2)
Basic skills and techniques in oxyacetylene welding and shielded metal arc welding. Introduction to welding for maintenance welders and welding technicians. Instruction and practice in brazing, flame cutting, electrode selection and various types of welds. Techniques of welding in all positions are learned through hands on practice. Safety hazards and safe practices in oxyacetylene welding, cutting and shielded metal arc are emphasized.

110 MIG/TIG WELDING FALL, SPRING 3 (2-2)
Considers various gas metal arc welding (MIG) processes, including microwire, flux-core, innershield and submerged arc, with emphasis on metal inert gas welding. Provides extensive experience in gas tungsten arc welding (TIG). Students will demonstrate techniques of welding in MIG and TIG, in all positions, using various gauges of metal.

120 BASIC HVAC FALL, SPRING 3 (2-2)
Fundamentals of heating and compression systems used in conditioning of air and controlled spaces. Includes combustion process, heat flow, temperature measurement, gas laws, and heating and refrigeration cycles and components used in systems. Introduces basic service procedures used in industry.
Pre-requisites: M, R

204 BASIC HYDRAULICS AND PNEUMATICS
FALL, SPRING FEE 2 (1-2)
Basic industrial fluid power systems common to field of industrial automation. Course includes basic principles, components, standards, symbols, cylinders, intensifiers, valves, motor circuits and related electrical control.
Prerequisites: M, R.

205 HYDRAULICS AND PNEUMATICS MAINTENANCE
FALL FEE 2 (1-2)
Troubleshooting, preventive maintenance and repair methods for industrial fluid power systems common to field of industrial automation. Topics include pumps, cylinders, intensifiers, valves, motor circuits and related electrical control.
Prerequisites: M, R, INMT 204

206 HYDRAULIC AND PNEUMATIC CIRCUITRY
SPRING FEE 2 (1-2)
Practical hydraulic and pneumatic power and control circuitry; selection of control methods and component sizing for desired function, timing, sequence, speed and pressure requirements. Considerations such as cost, efficiency, energy consumption and maintainability with practice in connecting circuits and testing proper function.
Prerequisites: M, R, INMT 204

240 PREDICTIVE AND PREVENTIVE MAINTENANCE
FALL, SPRING FEE 3 (2-2)
Predictive maintenance, team-driven maintenance tasks, and corrective maintenance to provide comprehensive support for all plant production and manufacturing systems. Emphasize regular evaluation of critical plant equipment, machinery and systems to detect potential problems and develop appropriate maintenance timelines to prevent problems from occurring.
Prerequisite: E, M, R, INMT 204

LAW ENFORCEMENT (LAWE)

140 INTRODUCTION TO CRIMINAL JUSTICE
FALL, SPRING 3 (3-0)
History, philosophy and mechanics of several elements that comprise the criminal justice system. Related responsibilities and vocational opportunities are discussed. Designed to introduce students to criminal justice system.
Prerequisites: E, R

142 POLICE ORGANIZATION AND ADMINISTRATION
FALL, SPRING 3 (3-0)
Functional divisions of organization and operation of modern police department functions studied are management operations, communications, budgeting, public relations, recruiting and training.
Prerequisites: E, R

144 CRIMINOLOGY FALL, SPRING 3 (3-0)
Nature and development of criminal behavior. Emphasis on examination of leading theories concerning cause of crime, nature of criminal offender and treatment of convicted offenders. Public reaction to crime reviewed.
Prerequisites: E, R

250 JUVENILE DELINQUENCY AND BEHAVIOR
FALL, SPRING 3 (3-0)
Problems of juvenile delinquency, theories on juvenile delinquency, work of youth agencies, legislative involvement and new approaches to prevention of juvenile crimes.
Prerequisites: E, R

251 SEMINAR IN CRIMINAL JUSTICE AND PUBLIC SAFETY SPRING 3 (1-4)
Current problems in criminal justice and public safety area. Special issues discussed and pre-service students assigned to agencies or departments as interns for field experience. Report required.
Prerequisites: E, R

252 CRIMINAL PROCEDURE SPRING 3 (3-0)
Study of Anglo-American system for detecting, proving and punishing perpetrators of crime. Legal protection of citizens from improper searches, arrests and coerced confessions by constitution, statute and case law. Rules of evidence in assisting judicial search for truth covered.
NOTE: Only Corrections students should take this course.

LOGISTICS (LOGI)

101 INTRODUCTION TO LOGISTICS
FALL, SPRING 3 (3-0)
This is an introductory course. It will explain why logistics is important in everyday living. The course will provide an overview of five subsectors of logistics - rules and regulations, domestic transportation, warehouse, inventory, purchasing.

102 WAREHOUSE AND DISTRIBUTION
FALL, SPRING 3 (3-0)
This course offers the student an understanding of warehouse and distribution processes including: receiving, storage, picking, packing, loading and shipping. Students will identify potential hazards within the warehouse and distribution workplace and be able to demonstrate safe work practices. Students will be able to document processes associated with warehouse and distribution and provide an explanation of how technology improves these processes.
Prerequisites: E, M, R and LOGI 101

103 TRAFFIC AND TRANSPORTATION
FALL, SPRING 3 (3-0)
This course will compare and contrast modes of transportation. Commercial, third party, private and expedited logistics will be discussed. Students will develop critical thinking and reasoning skills as well as decision making techniques. For a given product, the student will be able to describe the most appropriate mode of transportation for product-specific requirements and other requirements such as time, temperature, size and value. Students will be able to describe emergency contingency planning for spills, power outages, etc. Site visits and guest speakers will provide students with an introduction to current and emerging career opportunities specific to traffic and transportation.
Prerequisite: LOGI 101

104 RULES AND REGULATIONS SUMMER 3 (3-0)
This course will present an overview of the local, state and federal regulations that apply to the storage, transporting and delivery of goods. Requirements for the movement of goods internationally will also be discussed. A capstone project or paper on a topic approved by the instructor that demonstrates the student's understanding of logistics will be required.
Prerequisites: LOGI 101

105 LOGISTICS TECHNOLOGY
SPRING, SUMMER 3 (3-0)
This course will cover the context of electronic commerce/electronic business and enterprise resource planning (ERP) software. Supply chain software, Electronic Data Interchange (EDI) and customer relationship/sales software use in the logistics industry will be explored. Inputs to logistics functions will be examined, including Radio-Frequency Identification (RFID), bar coding, pick-by-voice, etc. Analytics will be performed primarily using Excel spreadsheets, although students will have exposure to other software. Students will practice using the software used by selected logistics companies.
Prerequisites: LOGI 101

205 LOGISTICS FIELD EXPERIENCE
SUMMER FEE 2 (0-30)
This 30-hour field experience is a planned work activity that is designed to introduce the student to the primary areas of logistics in shipping and warehousing. During the field experience students will have introductory instruction in general logistics operations. They will rotate through the departments at the companies where they are assigned to observe work activities.
Prerequisites: LOGI 101 with a C or better.

MACHINE TOOL TECHNOLOGY (MACH)

110 MACHINE TOOL I FALL, SPRING 3 (1-4)
Introductory course includes machining theory, demonstrations and shop experience. Basics in safety, blueprint reading, layout, band sawing, machine setup, lathe work, milling machine work and surface grinding. Machine theory and machine application comply with National Institute for Metalworking Skills (NIMS) Level I Machining Skill Standards.

120 MACHINE TOOL II FALL, SPRING 3 (1-4)
Advanced course covers metals, their composition and heat treatment, machining of threads and tapers on a lathe, milling of gears and other advanced machining and precision machining techniques will be introduced. Machine theory and machine applications comply with National Institute for Metalworking Skills (NIMS) Level I and Level II Machining Skill Standards.
Prerequisite: MACH 110

129 USE OF MACHINERY'S HANDBOOK
FALL 2 (2-0)
Selected topics will enable the student to find and interpret information within the Machinery's Handbook and will provide resource information for future reference.
Prerequisite: M, R

130 PRECISION INSPECTION
FALL, SPRING 3 (3-1)
Methods of inspecting industrial products. Emphasis on measuring devices such as sine bar, gage blocks, micrometers, vernier scales, electronic comparator and coordinate measuring machine. Students will develop skills in basic blue print reading, geometric dimensioning and tolerancing, understanding datums, and using the inch and metric systems.
Prerequisites: M, R

140 INTRODUCTION TO NUMERICAL CONTROL (NC) COMPUTER NUMERICAL CONTROL (CNC)
FALL, SPRING FEE 2 (1-2)
Numerically controlled machines for metal cutting. Required course for students enrolled in Machine Tool program, also recommended as introductory experience for employees attending factory training schools in future. Systems studied include microcomputer-controlled machines and CAD/CAM systems.
Prerequisites: M, R

150 INTRODUCTION TO CAM
FALL, SPRING, SUMMER FEE 2 (1-2)
Introductory course which included the basic concepts of CAM usage and progresses and Geometric definition, 2D Toolpaths, 3D Contouring and Surface Machining.
Prerequisites: M, R

220 PRESSWORKING OF METALS/MOLD MAKING
SPRING 3 (1-4)
Principles of die and mold making. Exit-level course in conventional machining methods. Students apply knowledge learned from previous courses and construct assigned die or mold. Course must be taken concurrently with DRAF 202.
Prerequisites: M, R, MACH 110, ENGY 103, DRAF 102

231 CMM FUNDAMENTALS
FALL, SPRING FEE 2(1-2)
Advanced course that focuses on the usage of a Coordinate Measuring Machine and its impact on industry.
Prerequisites: M, R, MACH 130

241 CNC PROGRAMMING I
FALL, SPRING, SUMMER FEE 2 (1-2)
Second of three courses in CNC sequence and required for students in Machine Tool program. Course teaches students to program numerically controlled machine tool and machine shape called out on part print. Programs for three axis machines prepared and used to make completed parts. Students learn to select appropriate fixtures, tools, inserts, speeds, FEEds and depth of cuts. Laboratory concentrates on preparation and debugging of tool path, tool application, selection of speeds and FEEds and auxiliary machine functions. Employs special features of computerized machining such as contour interpolations, absolute incremental switching, inch/metric selection and tool offsets.
Prerequisites: M, R, MACH 140

242 CNC PROGRAMMING II
FALL, SPRING FEE 2 (1-2)
Third of three courses in CNC sequence. An elective course for students in Machine Tool Program. Content designed to provide opportunity for student to gain advanced programming and machining skills. Students will employ special advanced features of computerized machining such as polar coordinate programs and special machine programming functions.
Prerequisites: M, R, MACH241

251 2D/3D MACHINING
FALL, SPRING, SUMMER FEE 2 (1-2)
Advanced course with a focus on CAM concepts such as surface and 3D machining.
Prerequisites: M, R, MACH 150

MAGNETIC RESONANCE IMAGING (MRIT)

100 PRECLINICAL PREPARATION
SUMMER FEE 3 (3-0)
Students will explore and discuss the importance of MRI safety and patient assessment. The ability to critically think will be emphasized as students investigate various patient related considerations requiring adaptation to successfully complete the MRI procedure. Basic pharmacology as it relates to the MRI patient will be discussed, as will infection control. Students will be introduced to MRI equipment, quality control and MRI procedures.
Prerequisites: E, M, R, qualified medical imaging licensure or acceptance into the MRI Program

101 PROFESSIONAL PROSPECTUS
SUMMER 1 (1-0)
This course will explore the integration of magnetic resonance imaging within the health care system. Students will explore the organizations and agencies that drive continual development of the MRI technologist's role and responsibilities. The course also focuses on legal and ethical implications as well as effective communication methods used to provide quality patient care and to reduce risk.
Prerequisites: E, M, R, qualified medical imaging licensure or acceptance into the MRI Program

102 MRI PROCEDURES AND PATHOPHYSIOLOGY
FALL 3 (3-0)
Provides an overview of imaging techniques related to the central nervous system and the musculoskeletal system. Specific clinical applications, coils available and their use, considerations in scan sequences, specific choices in the protocols and positioning criteria are practiced. Anatomical structures and the plane that best demonstrates anatomy will be discussed as well as signal characteristics of normal and abnormal structures.
Prerequisites: E, M, R, MRIT 100 and MRIT 101, C or better

103 MRI PHYSICS I FALL 3 (3-0)
The first in a two semester course that will cover the basic principles of MRI, data acquisition and tissue characteristics (proton spin, relaxation times, phasing and de-phasing) in image formation.
Prerequisites: E, M, R, MRIT 100 and MRIT 101

105 CLINICAL EXPERIENCE I
FALL FEE 3 (0-24)
The first of a three semester sequence scanning clinical experience. Head and neck techniques will be applied as well as additional time spent on spine and extremity work.
Prerequisites: E, M, R, MRIT 100 and MRIT 101, with a C or better

106 MRI PROCEDURES & PATHOPHYSIOLOGY II
SPRING 3 (3-0)
Provides an overview of imaging techniques related to the thorax/abdomen, special imaging techniques (functional MRI, spectroscopy, DWI, heart) and breast. Specific clinical applications, coils available and their use, considerations in scan sequences, specific choices in the protocols, and positioning criteria are practiced. Thoracic and abdominal anatomical structures and the plane that best demonstrates anatomy will be discussed as well as signal characteristics of normal and abnormal structures.
Prerequisites: E, M, R, MRIT 102, MRIT 103, MRIT 105 and MRIT 114, with a C or better

107 MRI PHYSICS II SPRING 3 (3-0)
The second in a two-semester course that provides a comprehensive overview of MRI pulse sequences, imaging parameters and image quality control.
Prerequisites: E, M, R, MRIT 102, MRIT 103, MRIT 114 and MRIT 105

108 MRI IMAGE ANALYSIS SUMMER 3 (3-0)
Case study analysis and student image portfolios will be utilized to evaluate for optimal diagnostic value. Critical assessment will include principles of quality image formation, identification of anatomy, identification of pathology and parameter adjustments needed for differential diagnosis. Additional discussion will focus quality control procedures, PACS image display, image post processing and image archiving.
Prerequisites: E, M, R, MRIT 106, MRIT 107, MRIT 109 and MRIT 115, with a C or better

109 CLINICAL EXPERIENCE II SPRING 3 (0-24)
The second of a three semester sequence of clinical application. Neurological and extremity competency work will continue as well as introductory experience in thoracic and abdominal scanning.
Prerequisites: E, M, R, MRIT 102, MRIT 103, MRIT 114 and MRIT 105

111 CLINICAL EXPERIENCE III SUMMER 3 (0-24)
The third in a three semester sequence of clinical application. Neurological, extremity, thoracic and abdominal scanning will continue. Additional experiences will include breast MR and advanced scanning applications such as cardiac, functional and spectroscopy MR.
Prerequisites: E, M, R, MRIT 106, MRIT 107, MRIT 109, MRIT 115 with a C or better

113 MRI REGISTRY REVIEW SUMMER 3 (3-0)
This course provides the student with instructional review and a self-examination process as preparation for the certification exam in Magnetic Resonance Imaging.
Prerequisites: E, M, R, MRIT 106, MRIT 107, MRIT 109, MRIT 115, with a C or better

114 APPLIED SECTIONAL ANATOMY
FALL 3 (3-0)
Provides an overview of transverse, coronal and sagittal sectional anatomy of the human body. Special emphasis is placed on a study of the head and brain, thorax, abdomen and pelvis. The shoulder, elbow, hip and knee are also examined. Correlations between cadaver cross-sections, MRIs, CTs and radiographs are explored.
Prerequisites: E, M, R, MRIT 100 and MRIT 101 with a C or better

115 COMPUTER APPLICATIONS IN MEDICAL IMAGING
SPRING 3 (3-0)
Computer applications in the radiologic sciences related to image capture, display, storage and distribution. Specific to MR, the content imparts an understanding of the components, principles and operation of digital imaging systems, image data management and data manipulation. Additional content provides basic concepts of patient information management including medical records concerns and privacy and regulatory issues.
Prerequisites: E, M, R, MRIT 102, MRIT 103, MRIT 105, MRIT 114 with a C or better

MANUFACTURING TECHNOLOGY (MANU)

111 MANUFACTURING PROCESSES I
FALL, SPRING 3 (2-2)
Introductory course includes historical perspective of manufacturing, materials processing, product development, material selection, and business principles and functions as related to manufacturing. May be offered in alternate formats.
Prerequisites: M, R

112 INTRODUCTION TO FABRICATION
FALL, SPRING, SUMMER 4 (3-1)
Students will learn to use commercially available technologies to conceptualize, design, develop, fabricate and test objects. The lab features advanced computer software and contemporary tools for cutting, milling, electronics, engraving and other processes of rapid and automated prototyping. Products and processes are typically individualized but can be developed entrepreneurially for commercial production.

120 FUNDAMENTALS OF PROGRAMMABLE CONTROLLERS FALL, SPRING 2 (1-2)
Introductory course to familiarize students with programmable controllers. Units include logic, input/output capabilities, programming and entering and editing programs.
Prerequisites: M, R

122 INTRODUCTION TO ROBOTICS
FALL, SPRING FEE 2 (1-2)
An introductory course designed to familiarize students with types of robots, axis designation, applications, terminology, drive systems and control systems as related to industrial robots.

215 FAB LAB I FALL, SPRING, SUMMER 4 (2-2)
Students will develop science and engineering skills by having hands-on access to high-tech manufacturing processes, specialized embedded software, computer-aided design software and mechanical subsystems. The Fab Lab will provide applied technical opportunities in an industry that is continuously changing and redefining itself.
Prerequisite: MANU 112

222 INDUSTRIAL ROBOTICS
FALL, SPRING FEE 4 (3-2)
This course is designed to provide students with basic operational knowledge and skills in working with robots. This course consists of classroom instruction and hands-on laboratory activities designed to reinforce the learning process and prepare students to perform basic robot manipulation.
Prerequisites: MANU 122

224 ROBOTICS INFRA-RED SYSTEMS
FALL, SPRING FEE 2 (1-2)
This course is designed to provide students with basic operational knowledge and skills in working with FANUC robots equipped with Infra-Red (iR) Vision navigation capabilities. This course consists of classroom instruction and hands-on laboratory activities designed to reinforce the learning process and prepare students to perform basic robot manipulation. This course covers the basic tasks and procedures required for an operator, technician, engineer or programmer to set up, teach, test and modify iRVision applications on a Robot Controller. This course is intended for the person who must install, set-up, program and troubleshoot a FANUC America iRVision system.
Prerequisites: MANU222 with a C or better

251 COMPETITIVE ROBOTICS SEMINAR
FALL FEE 4 (2-4)
This course provides the theory and background preparation for entry into a robotics competition. Students will focus on the design, programming, engineering and building techniques in robot design. In preparation the team will market and develop funds for the competition, research competition and competitor statistics and work cohesively to gain a broad understanding of robotics concepts.

MATHEMATICS (MATH)

***090 PRE-ALGEBRA**
FALL, SPRING, SUMMER 4 (4-0)
Individualized competency-based or lecture course in basic mathematical skills. Students are placed by assessment results at appropriate levels at beginning of course. Proficiency at 70-percent level must be demonstrated in each unit before progressing to the next unit. Covers whole numbers, fractions, decimals, ratio and proportion, percent, practical geometry and/or introduction to algebra.
Prerequisites: Compass score of 50 or taken concurrently with READ 083 or READ 083 with a C or better or READ 087 with a C or better or R

095 MATH LITERACY FOR COLLEGE STUDENTS
FALL, SPRING, SUMMER 4 (4-0)
Math Literacy for College Students is a one semester transitional studies math course integrating numeracy, proportional reasoning, algebraic reasoning and functions. Students will develop conceptual and procedural tools that support the use of key mathematical concepts in a variety of contexts. Throughout the course, college success content will be integrated with mathematical topics. Credit earned does not count toward any degree. Upon successful completion of the course, students may take Quantitative Reasoning (MATH 123), or Intermediate Algebra (MATH 122).
Prerequisite: MATH 090 or a Compass pre-algebra score of 40
Co-requisite: MATH 095A for students scoring below the placement score associated with entrance into MATH 095 (Compass score 30-39)

***095A INTRODUCTORY ALGEBRA-ENRICHMENT**
FALL, SPRING, SUMMER 1 (1-0)
Introductory Algebra-Enrichment is designed to provide structured support for students who have placed into MATH090 through Compass, but who have through alternative assessments been moved into MATH095. Alternately it is available for any 095 student desiring extra class time. This one hour structured class time will provide additional lecture and time on task for these students.
Prerequisite: Current enrollment in MATH 095

100 APPLIED MATHEMATICS FALL 4 (4-0)
Basic mathematics needed in occupational fields such as machine tool, electronics, industrial manufacturing, service and maintenance, etc. Topics include fractions, percent, decimals, angular measurement, square root, basic geometry, formulas and basic algebra conversions. Practice and practical applications
Prerequisites: M, R

110 TECHNICAL MATHEMATICS I SPRING 4 (4-0)
Introduction to mathematics applicable to technical areas. Includes topics in dimensional analysis, problem solving, approximate numbers, trigonometry of right angle and oblique triangles, vectors, radian measure, algebra and geometry applications and metric measurement and conversion.
Prerequisites: M, R, MATH 110 or MATH 128 or MATH 130 or MATH 135 with a grade of C or better

122 INTERMEDIATE ALGEBRA
FALL, SPRING, SUMMER 4 (4-0)
Provides students with sufficient algebraic knowledge and skills for success in subsequent mathematics or science courses. Brief review of four fundamental operations, real number system, factoring, fractions, linear and fractional equations and inequalities, linear and quadratic functions and their graphs, systems of equations, determinants and Cramer's Rule, exponents and radicals, quadratic equations.
Prerequisites: R, MATH 095 with C or better or associated placement test score(s)
NOTE: This is a renumbering of MATH 101.

123 QUANTITATIVE REASONING
FALL, SPRING, SUMMER 4 (4-0)
Quantitative Reasoning is designed to provide students with relevant mathematics and critical thinking skills they will need for their future college courses, their careers and their civic lives. The design provides a thematic, contextual approach that covers the fundamental quantitative skill set in depth. Topics include ratios, rates, percentages, units, descriptive and inferential statistics, linear and exponential modeling, correlation, logic and probability. This project-based course uses Microsoft Excel and emphasizes conceptual understanding and applications. Reading of current newspaper articles and exercises involving personal finance are incorporated to place the mathematics in real-world context.
Prerequisites: R, M, MATH 095 with a C or better

128 PRE-CALCULUS ALGEBRA
FALL, WINTER, SPRING 4 (4-0)
Prepares students for calculus. Topics include review of exponents and factoring, equations, graphs and functions, composite functions, inverse functions, systems of equations, linear programming, complex numbers, sequences and binomial theorem.
Prerequisites: R, MATH 122 with a C or better, or associated placement test score(s)
NOTE: This is a renumbering of MATH 109.

129 FINITE MATHEMATICS
FALL, SPRING 4 (4-0)
Finite Mathematics is designed to give business, economics, management, life science and social science students a firm background in finite math. Topics include: linear Functions; Mathematical Modeling of Linear Functions; Polynomial Functions (quadratic, cubic); Exponential and Logarithmic Functions; Inequalities; Mathematics of Finance; Counting Principals, Linear Programming; Linear Programming using Simplex Method and Revised Simplex Method; Systems of Linear Equations and Matrices; Measures of Central Tendency; Measures of Dispersion; Graphing Statistical Data; Simple Probability - Including Independent Events, Mutually Exclusive Events, Conditional Probabilities; Series and Sequences.
Prerequisites: R, MATH 122

130 PRE-CALCULUS TRIGONOMETRY
FALL, SPRING 3 (3-0)
Fundamental concepts of trigonometry and elementary applications of results. Topics include angle measure, fundamental identities, variation and graphs of trigonometric functions, right angle trigonometry, equations and polar coordinates. For students who intend to take calculus, this course may be taken after or concurrently with Math 128.
Prerequisites: R, MATH 122 with C or better, or associated placement test score(s)
NOTE: This is a renumbering of MATH 105.

135 PRECALCULUS ALGEBRA/TRIG
FALL, SPRING 5 (5-0)
This course is designed to provide the student with basic algebraic and trigonometric concepts necessary for calculus. Topics include: real numbers, inequalities, coordinate systems, functions, polynomials, solutions of polynomial equations, exponential and logarithmic functions, trigonometry and trigonometric functions.
Prerequisites: R, MATH 122 with C or better or associated placement test score(s)

151 CALCULUS I FALL, SPRING 5 (5-0)
Study of calculus of single variable. Topics include limits, derivative and integral properties of algebraic and transcendental functions and elementary applications of derivatives and integrals.
Prerequisites: R, MATH 128 and MATH 130 with C or better or MATH 135 with C or better or associated placement test score(s)

200 MATHEMATICS FOR ELEMENTARY TEACHERS
FALL, SPRING 4 (4-0)
For students preparing to teach grades K-6. Gives prospective teachers thorough understanding of important mathematical concepts, terminology and relationships. Helps students see how these concepts are presented to children at each grade level. Students expected to observe teaching of elementary children in actual classroom.
Prerequisites: R, MATH 095 or associated placement test score(s)

201 CALCULUS II SPRING 5 (5-0)
Continuation of MATH151. Topics include analytic geometry, techniques and applications of integration, infinite series, polar coordinates and vectors in two space.
Prerequisites: R, MATH 151 with C or better.

202 CALCULUS III FALL 5 (5-0)
Calculus with multiple independent variables. Topics include three dimensional vectors, partial derivatives, multiple integrations and vector analysis.
Prerequisites: R, MATH 201 with C or better

205 TECHNICAL MATHEMATICS II 4 (4-0)
Applied course for students in engineering and industrial technologies. Includes selected topics from analytic geometry, derivatives, integrals and their applications.
Prerequisites: MATH 110 or MATH 130

210 GEOMETRY FOR ELEMENTARY TEACHERS
FALL, SPRING 4 (4-0)
This course explores the fundamental ideas of planar and spatial geometry. Topics include: analysis and classification of geometric figures; geometric transformations; symmetry; measurement. This course includes an introduction to the use of computers in the teaching and learning of informal geometry.
Prerequisites: R, MATH 200 with C or better

216 INTRODUCTION TO STATISTICS 3 (3-0)
Statistical decision-making is surveyed. The topics include sampling techniques, tabular and graphical data, measures of central tendency and variability, simple probability, probability distributions (binomial, normal, t, chi-square and F), Central Limit Theorem, correlation and regression, estimation, hypothesis testing, analysis of variance and index numbers.
Prerequisites: E, R, MATH 122 with C or better or equivalent

252 DIFFERENTIAL EQUATIONS SPRING 4 (4-0)
Ordinary differential equations. Topics include equations with equations separable, homogeneous equations, exact equations, integrating factors, linear equations with constant coefficients, simultaneous linear equations and Laplace transformation. Applications to physics and engineering.
Prerequisites: R, MATH 201 with a C or better or MATH 202 with a C or better

265 PROBABILITY AND STATISTICS FOR ELEMENTARY/MIDDLE SCHOOL TEACHERS
FALL, SPRING 4 (4-0)
This course explores the basic concepts of statistics and probability appropriate for elementary and middle school teachers. Topics include statistical techniques for organizing, summarizing, presenting and interpreting data; sampling techniques; simulation methods; counting techniques; and analytic methods in probability. Graphing calculators are used to reinforce major course ideas.
This course is designed specifically to transfer Western Michigan University's elementary education program and may not transfer to other institutions.
Prerequisites: R, MATH 200 with a C or better

MEDICAL ASSISTING (MEDA)

102 LAW AND ETHICS FOR MEDICAL ASSISTING
SPRING 3 (3-0)
This course will cover medical law and scope of practice, as well as personal, professional and organizational ethics for Medical Assistants. Students will become familiar with criminal and civil law applicable to the Medical Assisting profession. Students will have the opportunity to examine and defend moral, ethical and legal decisions.
Prerequisites: E, R

104 MEDICAL OFFICE PROCEDURES I
SPRING 3 (3-0)
In this course students are introduced to the basic administrative procedures utilized in a medical office setting. Computer concepts, telephone techniques, scheduling, patient registration and the daily operations in a medical office environment are covered.
Prerequisites: E, R

201 APPLIED COMMUNICATIONS FOR MEDICAL ASSISTING SUMMER, SPRING 3 (3-0)
This course introduces students to various forms of communication in the medical office setting. Students will gain skills in the communication process, including verbal and nonverbal communication and clinical communication skills. Compliance with the Health Insurance Portability and Accountability Act (HIPPA) is also addressed.
Prerequisites: E, R, HEAL 101, MEDA 102, HEAL 103, MEDA 104, all with a C or better

202 HUMAN DISEASE OVERVIEW
SUMMER, SPRING 2 (2-0)
This course covers common diseases associated with human body systems. Topics will include diagnostic procedures and treatment modalities, and appropriate methods of patient instruction and education as they relate to diseases and disorders. Students will also learn about nutrition and health promotion.
Prerequisites: E, R, HEAL 101, MEDA 102, HEAL 103, MEDA 104, all with a C or better

203 PHARMACOLOGY FOR MEDICAL ASSISTING
SUMMER, SPRING 3 (3-0)
This course covers theoretical and practical instruction for the administration of medications, identification of commonly administered drugs, their uses and effects on the body, and their interaction with other prescription and non-prescription drugs. Emphasis will be placed on classifications, uses, routes of administration, dosages and side effects. Students will be expected to perform basic math, calculation of drug doses and become familiar with immunization schedules.
Prerequisites: E, M, R, HEAL 101, MEDA 102, HEAL 103, MEDA 104, all with a C or better

204 MEDICAL ASSISTANT CLINICAL LAB I
SUMMER, SPRING FEE 4 (2-4)
This course covers basic clinical procedures and fundamental principles utilized in the medical setting. Student will learn how to work with physicians and prepare patients for physical examination. Topics include patient history and assessment, vital signs, infection control and aseptic techniques, safety and first aid, CPR/AED training and patient education.
Prerequisites: E, M, R, HEAL 101, MEDA 102, HEAL 103, MEDA 104, all with a C or better

211 MEDICAL OFFICE PROCEDURES II
FALL, SUMMER 3 (3-0)
This course is a continuation of Medical Office Procedures I. Students will cover more complex medical office functions, including finances, practice management and banking procedures. Students will acquire and apply knowledge of the electronic health record as it relates to patient accounts, the financial practices of the medical office, human resources management and marketing for the medical office.
Prerequisites: E, M, R, HEAL 101, MEDA 102, HEAL 103, MEDA 104, MEDA 201, MEDA 202, MEDA 203, MEDA 204, all with a C or better

212 MEDICAL CODING FALL, SUMMER 3 (3-0)
Students will incorporate their knowledge of medical terminology as it relates to disease diagnosis and treatment, management of patient information and medical claims processing. Emphasis will be placed on developing a working knowledge of diagnostic and procedural terms utilizing the International Classification of Disease (ICD) and the American Medical Association's (AMA) current Procedural Terminology (CPT).
Prerequisites: E, R, HEAL 101, MEDA 102, HEAL 103, MEDA 104, MEDA 201, MEDA 202, MEDA 203, MEDA 204, all with a C or better

213 PHLEBOTOMY FALL, SUMMER 2 (1-2)
This course will encompass the knowledge and skills needed in blood drawing techniques. Students will learn about blood cell composition, blood sampling procedures and practicing universal precautions. Students will become proficient in drawing blood from multiple sites on the human body and diagnostic testing related to phlebotomy.
Prerequisites: E, R, MEDA 102, HEAL 103, MEDA 104, MEDA 201, MEDA 202, MEDA 203, MEDA 204, all with a C or better

214 MEDICAL ASSISTANT CLINICAL LAB II
FALL, SUMMER 4 (2-4)
Students will continue to build on skills from clinical Lab I and Phlebotomy and learn the Medical Assistants role in coordinating laboratory testing for patients. Students will develop skills necessary to perform diagnostic screening procedures, patient care, assisting with specialized exams and EKG testing.
Prerequisites: E, M, R, HEAL 101, MEDA 102, HEAL 103, MEDA 104, MEDA 201, MEDA 202, MEDA 203, MEDA 204, all with a C or better

221 MEDICAL ASSISTANT EXTERNSHIP
SPRING, FALL 3 (9-3)
The externship provides an opportunity for the student to experience working in a licensed healthcare practitioner's office or other clinical setting. Students will have the opportunity to work with established partner sites or find their own externship site with approval of the Program Director. The student will be required to perform 200 hours of supervised clinical and administrative medical assisting tasks in an ambulatory care or hospital setting. During the externship, the student will be evaluated by the physician or another qualified designated staff member.
Prerequisites: HEAL 101, MEDA 102, HEAL 103, MEDA1 04, MEDA 201, MEDA 202, MEDA 203, MEDA 204, MEDA 211, MEDA 212, MEDA 213, MEDA 214, all with a C or better

222 MEDICAL ASSISTANT CERTIFICATION REVIEW
FALL, SPRING 3 (3-0)
This course is designed to review all Medical Assisting program standards in preparation for the National Certified Medical Assisting Examination.
Prerequisites: HEAL 101, MEDA 102, HEAL 103, MEDA 104 and BIOL 110

MUSIC (MUSI)

100 BEGINNING APPLIED MUSIC 1 (0-.5)
Beginning applied music classes are individual instruction, intended for personal enrichment.

100A BEGINNING APPLIED MUSIC 1 (0-.5)
Beginning Voice **Prerequisite: MUSI113*
Beginning Clarinet
Beginning Trumpet, Cornet
Beginning French Horn
Beginning Trombone, Euphonium, Baritone
Beginning Tuba
Beginning Flute
Beginning Oboe
Beginning Bassoon

100B BEGINNING APPLIED MUSIC 1 (0-.5)
Beginning Piano **Prerequisite: MUSI115*
Beginning Pipe/Electric Organ
Beginning Saxophone
Beginning Percussion
Beginning Violin
Beginning Viola
Beginning Cello
Beginning String Bass

100C BEGINNING APPLIED MUSIC 1 (0-.5)
Beginning Electric/Acoustic Guitar
May be repeated three times for credit

100D BEGINNING APPLIED MUSIC 1 (0-.5)
Beginning classical Guitar
Prerequisites: MUSI185 and MUSI186

100E BEGINNING APPLIED MUSIC 1 (0-.5)
Beginning Applied Harp

101 CONCERT CHOIR FALL, SPRING 2 (0-4)
Varied range of sacred and secular music for purpose of study and performance. Choir performs in regular concerts each semester. Opportunity for small ensemble participation. Open to all students and community members with vocal ability through audition. May be repeated for credit.

103 SYMPHONIC WIND ENSEMBLE-SOUTHSHORE CONCERT BAND FALL, SPRING 2 (0-4)
Music ranging from traditional through contemporary styles. Open to all students and community members, through audition, with interest in performing concert band music. May be repeated for credit.

104 JAZZ BAND FALL, SPRING 1 (0-2)
Music in all styles of jazz and rock idioms. Includes techniques of rehearsing stage band, playing of student arrangements and performance of jazz compositions and arrangements in concert and various rock idioms. Open to all students by audition. May be repeated for credit.

106 VOCAL CHAMBER ENSEMBLE 1 (2-0)
A varied range of sacred and secular vocal music is covered for the purpose of study and performance. The ensemble performs in regular concerts each semester. Open to all students and community members with vocal ability through audition. May be repeated for credit.

107 STRING ENSEMBLE 1 (2-0)
This group performs string music of various periods and combinations. Open to all students by audition. May be repeated for credit.

108 SHOW CHOIR FALL, SPRING 2 (0-2)
Musical theatre and jazz music; open through audition. Performs regularly during semester, accompanied by small instrumental ensemble. Staging and choreography as important parts of performances. May be repeated for credit.

109 MUSIC APPRECIATION FALL, SPRING 3 (3-0)
Exposure to various compositions and techniques from major periods of music history beginning with antiquity, including 20th century contemporary works and a brief look at jazz. For non-Music majors.
Prerequisites: E, R

110 INTRODUCTION TO MUSIC THEORY 2 (2-0)
Music notation, sight-reading, keyboard and music terminology. For students to learn fundamentals of music as well as prospective Music majors or minors who have little or no theoretical training.

113 VOICE CLASS FALL, SPRING 2 (2-0)
Fundamentals of vocal production including posture, breathing and diction. Students perform in class on regular basis. Open to all students as well as Music majors and minors.

114 PIANO CLASS I FALL, SPRING 2 (2-0)
Beginning piano class for students with little or no prior musical experience. Focus on learning to read music as well as harmonization and transposition.

115 PIANO CLASS II FALL, SPRING 2 (2-0)
Continuation of Piano Class I, with emphasis on increased keyboard facility through technical study, acquisition of simple repertoire, harmonization and transposition.
Prerequisite: MUSI 114

117 SYMPHONIC WIND ENSEMBLE FALL, SPRING 1 (2-0)
This group performs regular public concerts. It performs the best in wind ensemble music, with particular emphasis on compositions expressly for the wind and percussion instrument medium. May be repeated for credit.

118 INTRODUCTION TO MUSIC TECHNOLOGY SPRING 2 (1-1)
This is an introduction to the use of computer in music and multimedia production including Musical Instrument Digital Interface (MIDI), sequencing, audio recording and synthesis. Transferability of this course is not guaranteed.
Prerequisites: E, R

120 APPLIED VOICE 1 (0-.5)
130 APPLIED PIANO
134 APPLIED PIPE/ELECTRIC ORGAN
140 APPLIED TRUMPET, CORNET
140A APPLIED TRUMPET
142 APPLIED FRENCH HORN
144 APPLIED TROMBONE, EUPHONIUM, BARITONE
146 APPLIED TUBA
150 APPLIED FLUTE
152 APPLIED OBOE
154 APPLIED BASSOON
156 APPLIED CLARINET
158 APPLIED SAXOPHONE
160 APPLIED PERCUSSION
170 APPLIED VIOLIN
172 APPLIED VIOLA
174 APPLIED CELLO
176 APPLIED ELECTRIC BASS
178 APPLIED ACOUSTIC/ELECTRIC GUITAR
180 APPLIED CLASSICAL GUITAR
181 APPLIED STRING BASS

162 BASIC MUSIC I 3 (3-0)
A study of traditional harmony through analysis and part writing including a review of fundamentals, diatonic triads in inversion, cadences and non-chord tones. For music majors and minors.
Prerequisites: E, R, MUSI 110 with a grade of C or better
Corequisite: MUSI 114, MUSI 164

163 BASIC MUSIC II SPRING 3 (3-0)
Continuation of MUSI 162. The study of diatonic and chromatic harmony through analysis and part writing, including diatonic and secondary 7th chords, the Neapolitan chord, augmented sixth chords and modulations to foreign keys.
Prerequisites: E, R, MATH 095 with a C or better or associated placement test score, MUSI 162 with a grade of C or higher
Corequisite: MUSI 115 and MUSI 165

164 AURAL COMPREHENSION I 1 (0-2)
Sight-reading, prepared performance and improvisation of melodies using solfegge syllables, dictation, recognition of musical events and ensemble skills. The course concentrates on diatonic melodies, simple and compound divisions of beat, intervals and triads.
Prerequisites: Acceptance into MUSI 162
Corequisites: MUSI 114, MUSI 162

165 AURAL COMPREHENSION II 1 (0-2)
A continuation of MUSI164. Sight-reading, prepared performance and improvisation of melodies using solfegge syllables, dictation, recognition of musical events and ensemble skills. This course concentrates on diatonic melodies, simple and compound division of the beat, triads and seventh chords and harmonic dictation.
Prerequisites: MUSI 164 with a grade of C or better
Corequisites: MUSI 115, MUSI 163

185 ROCK & FOLK GUITAR FALL, SPRING 1 (1-0)
Group instruction in guitar fundamentals for the student who has had little or no previous experience. The course will provide basic instruction in using the guitar as an accompanying instrument and as a solo or melody-playing instrument, and will provide the fundamentals of music reading. The student will be required to have access to a Classical or Folk type guitar.

186 GUITAR CLASS II 1 (1-0)
A continuation of Guitar Class I. Instruction will be provided on bar chords, transposition, improvisation, tablature and various strumming techniques. The student will be required to have access to a Folk or Classical type guitar.
Prerequisites: MUSI 185 or permission of the instructor

187 HISTORY OF ROCK MUSIC
FALL, SPRING 3 (3-0)
The course seeks to deepen students' understanding of modern society and culture through the examination of rock and roll music. The development and evolution of the music's diverse styles are explored within the context of sociological and political events.
Prerequisites: E, R

188 APPLIED HARP 1 (1-0)
College level applied music class, requires an audition or permission of instructor to qualify and include individual instruction for Music majors or highly-proficient musicians. All students are required to perform to a jury.

189 ROCK/POP MUSIC ENSEMBLE
FALL, SPRING 1 (0-2)
This ensemble performs music in all styles of pop and rock idioms. Techniques of popular music performance and student generated arrangements serve as the foundation of this course. Open to all students. May be repeated for credit.

190 PERCUSSION ENSEMBLE SPRING 1(0-2)
This course provides students with the opportunity to learn percussion techniques and literature through rehearsal and performance in a chamber setting. The repertoire is diverse, including pieces for keyboard percussion, non-pitched percussion works, jazz oriented music and compositions featuring the entire family of percussion instruments. Open to music majors and non-music majors with an interest and background in percussion. Permission of instructor required.

200 MUSIC FOR THE ELEMENTARY TEACHER
FALL, SPRING 3 (3-0)
Designed for elementary education majors and assuming little or no musical background, this course will develop skill in the teaching and the performing of music in the elementary classroom setting. Students will develop fundamental musical skills, organize and develop musical activities and lesson plans, as well as explore the integration of music across the curriculum and in specialized areas.
Prerequisites: E, R

213 MUSIC HISTORY I FALL 3 (3-0)
Survey course of music in the Western world from antiquity through twentieth century. covers Middle Ages, Renaissance, Baroque and early classical periods.
Prerequisites: E, R

214 MUSIC HISTORY II SPRING 3 (3-0)
Survey course of music in the Western world from antiquity through twentieth century. Covers later classical period, Romantic period and twentieth century. American composers of twentieth century emphasized.
Prerequisites: E, R

220 APPLIED VOICE 2 (0-1)
230 APPLIED PIANO
233 APPLIED PIANO/RHYTHM, JAZZ, BLUES
234 APPLIED PIPE/ELECTRIC ORGAN
240 APPLIED TRUMPET, CORNET
240A APPLIED TRUMPET
242 APPLIED FRENCH HORN
244 APPLIED TROMBONE, EUPHONIUM, BARITONE
246 APPLIED TUBA
250 APPLIED FLUTE
252 APPLIED OBOE
254 APPLIED BASSOON
256 APPLIED CLARINET
258 APPLIED SAXOPHONE
260 APPLIED PERCUSSIOIN
270 APPLIED VIOLIN

272 APPLIED VIOLA
274 APPLIED CELLO
276 APPLIED ELECTRIC BASS
278 APPLIED ACOUSTIC/ELECTRIC GUITAR
280 APPLIED CLASSICAL GUITAR
281 APPLIED STRING BASS
288 APPLIED HARP

College level Applied Music classes are for Music majors and other accomplished musicians. Successful completion of one-credit hour college class in instrument or permission of instructor a prerequisite for all classes. All students are required to perform for a jury. May be repeated three times for credit.

262 BASIC MUSIC III 3 (3-0)
A continuation of MUSI 163. A study of the principles and techniques of organization in tonal music, including fugue, binary and ternary forms, sonata, theme and variation, rondo and one-part forms through analysis and composition.
Prerequisites: E, R, MUSI 163 with a grade of C or better
Corequisite: MUSI 264

263 BASIC MUSIC IV 3 (3-0)
A continuation of MUSI262. A study of the organizational techniques of 20th century music, including the extension of chromaticism in late 19th century music, impressionism, pandiatonicism, polytonality, modality, 20th century tonality, atonality, serial techniques and minimalism.
Prerequisites: E, R, MUSI 262 with a C or better
Corequisite: MUSI 265

264 AURAL COMPREHENSION III 1 (0-2)
A continuation of MUSI165. Sight-reading, prepared performance and improvisation of melodies, using solfegge syllables, dictation, recognition of musical events and ensemble skills. This course concentrates on chromatic melodies with modulation, changing and composite meters and harmonic dictation.
Prerequisites: MUSI 165 with a C or better
Corequisite: MUSI 262

265 AURAL COMPREHENSION IV 1 (0-2)
A continuation of MUSI 264. Sight-reading, prepared performance and improvisation of melodies using solfegge syllables, dictation, recognition of musical events and ensemble skills. This course concentrates on modes, asymmetrical meters, altered chords and interval music.
Prerequisites: MUSI 264 with a grade of C or better
Corequisite: MUSI 263

NATURAL SCIENCE (SCIE)

095 FUNDAMENTALS OF SCIENCE REASONING FALL, SPRING, SUMMER 4 (3-2)
Provides students the opportunity to develop science reasoning skills and thought processes that are critical in all College-level science courses. Areas covered include scientific process, observations, value judgments, inferences; experimental set-up, data collection, variables; scientific communication; study techniques; problem solving, basic statistical analysis, graph interpretation, spatial relationships; measurements, metric system, estimation; and basic laboratory skills.

NURSING (NURS)

130 PHARMACOLOGY I FALL 2 (2-0)
Nursing 130 is the introduction of basic principles of pharmacology including pharmacodynamics, pharmacokinetics, legal aspects, controlled substances, drug testing and specific selected categories. Also included is the study of pharmacology math. Principles are based on the concepts of the role of the nurse as well as the concepts of client centered care, critical thinking, communication, accountability and competence along the health continuum and across the lifespan.
Prerequisites: E, M, R, READ 110, BIOL 205, CIS 102, CHEM 104 and acceptance into the nursing program or permission of instructor/director

135 PHARMACOLOGY II SPRING 2 (2-0)
Nursing 135 builds on Nursing 130, continuing and expanding upon concepts learned. The focus of this course is the study of selected classifications of medications and the nurse's role in administering and monitoring them. Principles are based on the concepts of the role of the nurse as well as the concepts of client-centered care, critical thinking, communication, accountability and competence. Learning focuses on the care of the individual across the healthcare continuum and throughout the life span.
Prerequisites: E, M, R, READ 110, BIOL 205, BIOL 206, CIS 102, CHEM 104, ENGL 101, PSYC 201, NURS 130, NURS 180 and acceptance into the nursing program or permission of instructor/director

180 NURSING FUNDAMENTALS FALL 6 (3-9)
Nursing 180 is a fundamental course where students learn the philosophy of nursing, including the roles of the nurse as provider of care, manager of care and member of a profession. Nursing uses a base of science, art and technology to guide the student towards identifying self as an individual and nurse in the associate degree or the practical nurse role within the environment. The concepts of client-centered care, critical thinking, communication, accountability, and competence along the health continuum and across the lifespan are integrated. Students learn theoretical concepts, skills and principles basic to the care of individuals with common health problems. Beginning medical-surgical concepts are introduced. Learning is applied by planned experiences in the classroom, nursing laboratory, and acute and long-term care facilities in the community throughout the semester.
Prerequisites: E, M, R, READ 110, BIOL 205, CIS 102, CHEM 104 and acceptance into the nursing program or permission of the instructor/coordinator

185 WOMEN'S HEALTH SPRING 4 (2.4-4.8)
Nursing 185 builds on Nursing 180, continuing and expanding the base of science, art and technology, guiding the student towards identifying self as an individual and nurse in the associate or practical nurse role within the environment. Concepts of client-centered care, critical thinking, communication, accountability and competence are expanded upon. The course reinforces student understanding and adoption of the nursing roles as provider of care, manager of care and member of a profession. The learning focuses on the care of individuals along the health continuum and across the lifespan with common women's

health conditions such as adolescence, childbearing experience, menopause and simple gynecological conditions. Learning is applied during 5 weeks of clinical experience in community and acute care settings.
Prerequisites: E, M, R, READ 110, BIOL 205, BIOL 206, CIS 102, CHEM 104, ENGL 101, PSYC 201, PSYC 203 (may take concurrently), NURS 130, NURS 180 and acceptance into the nursing program or permission of instructor/coordinator

186 MEDICAL-SURGICAL NURSING I
SPRING 3 (1.5-4.8)
Nursing 186 builds on Nursing 180, continuing and expanding concepts learned. The course reinforces student understanding and adoption of nursing roles as provider of care, manager of care and member of a profession. Learning focuses on the care of the individual along the health continuum and across the life span with selected common medical-surgical conditions. These conditions include the perioperative experience, fluid and electrolyte imbalance and gastrointestinal impairment. Learning is applied during four and one half weeks of clinical experience in an acute-care facility.
Prerequisites: E, M, R, READ 110, BIOL 205, BIOL 206, CIS 102, CHEM 104, ENGL 101, PSYC 201, NURS 130, NURS 180 and acceptance into the nursing program or permission of instructor/coordinator

187 MEDICAL-SURGICAL NURSING II
SPRING 3 (1.5-4.8)
The focus of this course is on the adult client in a state of wellness through critical illness. Students will provide safe care using knowledge previously derived from nursing and other disciplines. The student will assist adult clients in meeting health care needs with neurological, respiratory, cardiovascular, emergency, and burn conditions. Critical thinking, the nursing process and concepts of caring will be used to provide client centered are across the life span. Effective communication will be used to manage care for all individuals with common self-development and learning. Classroom and clinical experience will allow the student to apply theory and skills as a provider of care, manager of care, and as a member of a profession. Clinical experience is scheduled for four and one-half weeks in the nursing laboratory and in acute care settings.
Prerequisites: E, M, R; READ 110, BIOL 205, CIS 102, CHEM 104, ENGL 101, PSYC 201, PSYC 203, BIOL 206, ENGL 102, HOSP 113, PHED 200, SOC 101, NURS 130, NURS 180, NURS 135, NURS

280 COMMUNITY MENTAL HEALTH
FALL 4 (2.3-5.3)
Utilizing a systematic and multidisciplinary approach, students in the course will assist mentally ill individuals and others with disrupted homeostasis in meeting emotional health care needs in the hospital and in community agencies over a five-week period. Critical thinking, the nursing process and concepts of caring will be used to provide client-centered care. Using effective communication, students will manage care for culturally diverse individuals, families and significant others. Students, as future members of the nursing profession, will accept accountability for the ethical, legal and professional dimensions of nursing practice.
Prerequisites: E, M, R, READ 110, BIOL 205, CIS 102, CHEM 104, ENGL 101, PSYC 201, PSYC 203, BIOL 206, ENGL 102, HOSP 113, PHED 200, SOC 101, NURS 130, 180, 135, 185, 186 and 187, and acceptance into the nursing program or permission of the instructor/coordinator

281 MEDICAL-SURGICAL NURSING III
FALL 3 (1.5-4.8)
NURS 281 reinforces understanding and adoption of nursing roles as provider of care, manager of care and member of the profession. Students begin to relate concepts of client-centered care, communication, critical-thinking, accountability and competency learned from previous nursing courses to the care of individuals along the health continuum and across the lifespan with common conditions. These conditions include rheumatic disorders, musculoskeletal disorders, musculoskeletal trauma and neoplastic conditions. Clinical experience is provided for four and one-half weeks in the nursing laboratory, acute/long-term, community and specialty care settings.
Prerequisites: E, M, R, READ 110, CIS 100, CHEM 104, ENGL 101, ENGL 102, HOSP 113, BIOL 205, BIOL 206, PSYC 201, PSYC 203, NURS 130, 135, 180, 185, 186 and 187 and acceptance into the nursing program or permission of the instructor/coordinator

282 MEDICAL-SURGICAL NURSING IV
FALL 3 (1.5-4.8)
The focus of this course is on the adult client in a state of wellness through illness. Students in this course will assist adult clients in meeting health care needs in genitourinary, blood dyscrasias, biliary, immunological, neurological and renal conditions. Students in this course will apply newly acquired theory and skills as a provider of care, manager of care and as a member of a profession for the adult client. In providing client centered care, students will use critical thinking, effective communication skills and be accountable for providing competent nursing care. Clinical experience is provided for four and one-half weeks in the laboratory, acute care units and community settings.
Prerequisites: E, M, R, READ110, BIOL205, BIOL206, CIS102, CHEM105, ENGL101, ENGL102, PSYC201, PSYC203, HOSP113, PHED200, NURS130, NURS135, NURS180, NURS185, NURS186, NURS187 and acceptance into the nursing program or permission of the instructor/coordinator

285 CHILDREN'S HEALTH SPRING 4 (2.3-5.3)
The major emphasis in this course will be upon the child and family in health and illness. Safe, competent and client-centered care will be provided in hospital and community settings over a five-week period using the nursing process, critical thinking and concepts of caring. Students will manage care for culturally diverse individuals and groups. In addition, as future members of the nursing profession, students will accept responsibility for ethical, legal and professional dimensions of nursing practice.
Prerequisites: E, M, R, READ 110, BIOL 205, CIS 102, CHEM 105, ENGL 101, PSYC 201, PSYC 203, BIOL 206, ENGL 102, HOSP 113, PHED 200, SOC 101, NURS 130, 180, 135, 185, 186, 187, 280, 281 and 282, and acceptance into the nursing program or permission of the instructor/coordinator

286 MEDICAL-SURGICAL NURSING V
SPRING 3 (1.5-4.8)
NURS 286 expands upon student understanding and adoption of nursing roles as provider of care, manager of care and member of the profession. Students continue to relate concepts of client-centered care, communication, critical thinking, accountability and competency learned from previous nursing courses to the care of individuals along the health care continuum and across the lifespan of selected common recurring conditions. These conditions include acute cardiovascular impairment and endocrine disorders. Also included in this course are nursing leadership and nursing management concepts. Clinical experience is provided for four and one-half weeks in acute/long-term care, community and specialty care settings.
Prerequisites: E, M, R, READ 110, CIS 102, CHEM 105, ENGL 101, ENGL 102, HOSP 113, BIOL 205, BIOL 206, PSYC 201, PSYC 203, NURS 130, 135, 180, 185, 186, 187, 280, 281 and 282, and acceptance into the nursing program or permission of the instructor/coordinator

287 MEDICAL-SURGICAL NURSING VI
SPRING 3 (1.5-4.8)
The focus of this course is on the adult client in a state of wellness through critical illness. Students will provide safe care using knowledge previously derived from nursing and other disciplines. The student will assist adult clients in meeting health care needs with neurological, respiratory, cardiovascular, emergency, and burn conditions. Critical thinking, the nursing process and concepts of caring will be used to provide client centered are across the life span. Effective communication will be used to manage care for all individuals with common self-development and learning. Classroom and clinical experience will allow the student to apply theory and skills as a provider of care, manager of care, and as a member of a profession. Clinical experience is scheduled for four and one-half weeks in the nursing laboratory and in acute care settings.
Prerequisite:E, M, R; READ 110, BIOL 205, CIS 102, CHEM 104, ENGL 101, PSYC 201, PSYC 203, BIOL 206, ENGL 102, HOSP 113, PHED 200, SOC 101, NURS 130, NURS 180, NURS 135, NURS 185, NURS 186, NURS 187

288 CURRENT ISSUES IN NURSING
SPRING, SUMMER 1 (1-0)
Current Issues in Nursing is a capstone class intended to expand on the socialization of the student into the role of Member of a Profession. Contemporary trends and issues in nursing are discussed with a brief historical perspective. Levels of educational preparation for nursing with scope of practice for the levels, along with the need for lifelong learning, are presented along with ethical and legal issues. Licensure issues, professional organization and employability skills complete the preparation for the professional role.
Prerequisites: E, M, R, READ 110, CIS 102, CHEM 105, BIOL 205, BIOL 206, ENGL 101, ENGL 102, PSYC 201, PSYC 203, NURS 130, 180, 185, 186, 187; also either NURS 190 and NURS 191 or NURS 280, 281, 282, and acceptance into the nursing program or permission of instructor/coordinator

OFFICE INFORMATION SYSTEMS (OIS)

101 KEYBOARDING I
FALL, SPRING, SUMMER 2 (0-2)
Beginning keyboard course for students with no prior training in use of a keyboard. Class is self-paced and self-instructional. Students learn alphabetic, numeric and symbol keys including ten-key pad.
Prerequisite: R

102 KEYBOARDING II
FALL, SPRING, SUMMER 2 (0-2)
Introductory course on a computer using a software package. Students develop correct keyboarding techniques and skill in practical production problems such as centering, letters, manuscript, simple tabulations and forms. This class is self-paced and self-instructional. Open to students with limited training in keyboarding or speeds less than 25 net words per minute.
Prerequisite: R

103 KEYBOARDING III
FALL, SPRING, SUMMER 2 (0-2)
Concentrates on using a computer software package to review the keyboard, improve techniques and build speed and accuracy. This class is self-paced and self-instructional. The course is designed for students who plan to use keyboarding either vocationally or personally. The course is review of OIS 102.
Prerequisites: R, OIS 102 or equivalent and keyboarding speed of at least 25 net words per minute

104 PROOFREADING & EDITING
FALL, SPRING 2 (2-0)
Proofreading and editing is designed to elevate the editing and proofreading proficiency of students so that they are able to prepare professional written communications. Emphasis is on recognition of inaccuracies (grammar, usage, mechanics and punctuation) and searching and applying reference sources efficiently. Working knowledge of Microsoft Word is strongly recommended.
Prerequisites: E, M, R

114 COMPUTER APPLICATIONS I
FALL, SPRING, SUMMER 3 (3-0)
Students will learn the most common applications for Word, Excel, Access and PowerPoint used in business and industry. While developing a foundational fluency in Microsoft Office, this course will introduce and teach students how to solve the most common word processing, spreadsheet, presentation and database problems.
Prerequisites: M, R

125 RECORD MANAGEMENT FALL, SPRING 3 (3-0)
Concentrates on effective and efficient management of business records. This course covers both manual and computer records management systems. Topics include basic filing methods, storage systems and supplies, information retrieval, records retention and disposition, indexing, records protection and procedures, and the operation and control of filing systems. Database applications are also covered.
Prerequisites: M, R

131 WORD PROCESSING SKILLS
FALL, SPRING SUMMER 1 (1-0)
This course is designed to provide students with the fundamentals of word processing. Students will demonstrate a wide range of skills including editing and formatting text and graphics, creating tables and SmartArt, and merging documents with other programs.
Prerequisites: E, R

132 SPREADSHEET SKILLS
FALL, SPRING, SUMMER 1 (1-0)
The purpose of this class is to teach spreadsheet construction and to acquaint the student with the proper way to solve spreadsheet problems. Students will learn how to enter and edit data, edit formulas, work with functions, format cells, print spreadsheets, create charts and save a workbook. Practical problems will illustrate spreadsheet applications and many new capabilities of spreadsheets in a graphical use/World Wide Web environment.
Prerequisite: E, M, R

133 PRESENTATION SKILLS
FALL, SPRING, SUMMER 1 (1-0)
This class will teach students how to create presentations suitable to a business environment using presentation software. Learn how to create professional presentations, create and edit slides, insert images, create effects and apply designs, presentation and use of charts and graphs. Students will work with different views, printing, saving and running the slide show.
Prerequisite: E, R

134 DATABASE SKILLS
FALL, SPRING, SUMMER 1 (1-0)
The purpose of this class is to teach database construction and to acquaint the student with the proper way to manage database components. Students will learn how to enter and edit data, and work with tables, queries, forms and reports. Practical problems will illustrate database applications and the many new capabilities of databases in a business environment.
Prerequisites: E, M, R

201 COMPUTER APPLICATIONS II
FALL, SPRING, SUMMER 3 (3-0)
Further development in the Microsoft Office applications to produce professional documents, tables, charts, databases and presentations. Course includes increased development of speed and accuracy on computer keyboarding. Typing speed of 50 net words per minute is strongly recommended.
Prerequisites: M, R, OIS 114

205 INTEGRATED BUSINESS PROJECTS
FALL, SPRING 4 (4-0)
Students will develop problem-solving abilities while applying advanced software skills to real-world situations by creating enhanced and integrated business documents. Students learn how data can be used, analyzed and synthesized in a business situation. Strong working knowledge of Microsoft Word, Excel, Access and PowerPoint is required.
Prerequisites: E, M, R, OIS 201

211 OFFICE PROCEDURES FALL, SPRING 3 (3-0)
Focuses on secretarial and clerical technologies studied and practiced in a typical office environment. Topics include discussion and hands-on use of the latest office technologies, personal presentation, practice in mailing procedures, proper use of communication mediums, employment strategies, office etiquette and development of appearance and personality.
Prerequisites: R

219 LEGAL OFFICE PROCEDURES
SPRING 3 (3-0)
This course focuses on duties of legal office professionals and the skills needed to keep a law office running smoothly. Special attention given to legal vocabulary, typing, documents, filing and accounting in the legal office setting. Included is an in-depth look at how legal environments differ from other businesses, including the ethical issues you may face. Permission of instructor is required to waive OIS course prerequisites.
Prerequisites: E, R, OIS114 with a C or better

220 MEDICAL OFFICE PROCEDURES
FALL, SPRING 3 (3-0)
In this course students are introduced to the basic administrative procedures used in a medical office setting. Computer concepts, telephone techniques, scheduling, patient registration and the daily operations in a medical office environment are covered.
Prerequisites: E, R

261 OFFICE CO-OP I FALL, SPRING 3 (1-15)
Allows students to work in an approved office training station and earn credits for satisfactory secretarial experience. Minimum of 15 hours work per week required. Each student meets one hour per week with coordinator in related class. To participate in class, application must be placed with coordinator.
Prerequisites: E, M, R, advanced standing in Office Information Systems program, 2.00 GPA or higher in all previous college work and approval of coordinator

262 OFFICE CO-OP II SPRING 3 (1-15)
Elective for students who successfully completed OIS 261. Minimum of 15 hours work per week required. Each student meets one hour per week with coordinator in related class. To participate in class, application must be placed with coordinator.
Prerequisites: E, M, R, OIS 261 or equivalent, approval of coordinator

PHARMACY TECHNICIAN (PHAR)

201 PHARMACY TECH FOUNDATIONS
SPRING 3 (3-0)
An introduction to various roles and responsibilities of a pharmacy technician. Students will learn good communication and interpersonal skills; professional attitudes and behaviors; a methodical, detail-oriented approach to tasks; and a high standard of ethical conduct. Compliance with the Health Insurance Portability and Accountability Act (HIPAA) is also covered.
Prerequisites: R, BIOL 110 or BIOL 205 or BIOL 206, ENGL 101, HEAL 101, HEAL 103, MATH 122 or MATH 123

211 PHARMACEUTICAL CONCEPTS & CALCULATIONS
SUMMER 3 (3-0)
This course will provide practice in pharmacy math calculations, conversions, measurements and equations for preparation of doses, parenteral solutions and compounded products. Pharmacy operations, inventory applications and purchasing needs in a pharmacy environment are covered.
Prerequisites: PHAR 201

212 PRESCRIPTION PROCESSING & SIMULATIONS
SUMMER FEE 4 (2-4)
This course covers lab procedures and skills to prepare patient specific medications for distribution. Preparing, storing and distribution of medication products are covered. Topics include application of theoretical and practical aspects of procurement, billing, reimbursement and inventory management in a pharmacy environment.
Prerequisites: PHAR 201

221 PHARMACY TECH CLINICAL I FALL 3 (2-4)
This course provides an opportunity for the student to experience working in a pharmacy environment where they can practice the use of electronic medication databases, product recalls and shortages, and quality assurance processes.
Prerequisites: PHAR 211, PHAR 212

222 PHARMACY TECH EXAM REVIEW
SPRING FEE 3 (3-0)
This course provides the student with review of key concepts and self-examination in preparation for the Pharmacy Technician Certification Board (PTCB) examination.
Prerequisites: PHAR 221

223 PHARMACY TECH CLINICAL II
SPRING 3 (2-4)
This course provides an opportunity for the student to experience working in a pharmacy environment where they can practice the use of bar-coding, automated dispensing technology, unit-dose packaging and reporting.
Prerequisites: PHAR 221

PHILOSOPHY (PHIL)

101 INTRODUCTION TO PHILOSOPHY
FALL, SPRING 3 (3-0)
Nature of philosophy by consideration of major types of philosophical questions such as the principles of rational belief, the existence of God, pursuit of a good life, nature of knowledge, problem of truth and verification, and relationship of people to state. Establishes frames of reference so students can begin asking philosophical questions.
Prerequisites: E, R

102 INTRODUCTION TO LOGIC
FALL, SPRING 3 (3-0)
Ways people reason and come to conclusions. Helps students to understand and evaluate other people's arguments. Focus on ways to test reliability of own reasoning and construct sound arguments.
Prerequisites: E, R

215 INTRODUCTION TO RELIGIOUS THOUGHT
FALL 3 (3-0)
History, scope, subject matter and goals of world religions. Basic concepts common to most major religions. Recommended for sophomores.
Prerequisites: E, R

250 SOPHOMORE SEMINAR IN PHILOSOPHY
SPRING 3 (3-0)
Special themes within philosophy of interest to non-Philosophy majors. Themes include Problems in Philosophy of Science, Issues in Business Ethics, Introduction to Medical Ethics, Man and Machines - A Philosophy of Technology, or Philosophy of Law. Semester class schedule indicates theme to be covered.
Prerequisites: E, R sophomore standing or permission of instructor

PHYSICAL EDUCATION & WELLNESS (PHED)

102 INTERMEDIATE VOLLEYBALL 1 (0-2)
For students with experience playing power volleyball. Advanced offenses and defenses. Competitive tournaments run throughout class.

105 BOWLING SPRING 1 (1-1)
Emphasis will be placed on fundamental skills including footwork, approach, delivery, timing, release and scoring.

106 INTERMEDIATE BOWLING SPRING 1 (1-1)
Designed for the bowler who possesses basic techniques. Emphasis will include spare angles, ball drilling, lane maintenance, ball adjustment for strikes and correction of form.
Prerequisite: PHED 105

107 GOLF 1 (1-1)
Emphasis will be placed on proper use of irons, woods and putting with proper stance, approach, grip, full swing and body positioning. Opportunity for actual play on golf course will be made available.

118 PHYSICAL CONDITIONING
FALL, SPRING, SUMMER **1 (0-2)**
Knowledge and appreciation of continued state of physical fitness. Personal fitness program developed and implemented. Actual implementation of individual's personal fitness program.

124 WEIGHTLIFTING
FALL, SPRING, SUMMER **1 (0-2)**
Taught in classroom and gym. Classroom portion emphasizes human musculature as related to weight resistive programs. Lifting portion involves both weight training and cardiovascular with emphasis being total fitness.

125 INTERMEDIATE WEIGHTLIFTING
FALL, SPRING, SUMMER **1 (0-2)**
Continuation of basic course. Individual programs designed based upon student goals. Opportunity to develop strength or body building programs utilizing universal equipment and/or free weights.
Prerequisite: PHED124

127 INTRODUCTION TO BASKETBALL **1 (0-2)**
Introduction to the sport of basketball. Includes all skills necessary to play the game as well as some defensive and offensive strategies.

128 INTRODUCTION TO SOFTBALL
(ON DEMAND) **1 (0-2)**
This course will give a basic introduction to the sport of softball as a lifetime team sport. It will include all of the skills necessary to play the sport, such as batting, fielding, catching and throwing. The completion of the course will be a tournament held in class.

130 BACKPACKING **1 (0-2)**
Fundamental knowledge in areas of wilderness ethics, equipment selection and usage, food selection and preparation, physical conditioning, limited first aid, clothing requirements, camp site selection and maintenance, proper fire consideration and trip organization. Students required to take part in weekend backpacking trip.

131 BASIC SCUBA **1 (0-2)**
Introduction to diving equipment, fundamentals of physics and physiology related to diving. Practical applications emphasized for all necessary basic diving techniques. Upon satisfactory completion of course, NAUI Basic Scuba Certification awarded. Students must have healthy lungs and not be suffering from asthma or any airway-restricting condition. Minimum 12 years of age required.

133 BEGINNING VOLLEYBALL **1 (0-2)**
Current rules and history, and skill techniques of spike, service, forearm pass, setup, blocking and strategy. Tournaments conducted throughout class.

134 FUNDAMENTALS OF BASEBALL FALL **1 (0-2)**
This class provides basic instruction in the fundamental skills of baseball including hitting, fielding, catching and throwing. Game-like situations will also be practiced. The student will gain knowledge of the rules of baseball.

145 TOTAL FITNESS I
FALL, SPRING, SUMMER **FEE 1 (0-2)**
This is an individualized course which offers an introduction to and participation in multi-station aerobic super-circuit utilizing sub maximal weights with multiple repetitions. The class uses an open lab concept where students satisfy requirements of the class by attending open hours. The average workout time for all stations including warm-up and cool down is 50 minutes. The course is taken for college-credit with a letter grade assigned.

146 TOTAL FITNESS II
FALL, SPRING, SUMMER **FEE 1 (0-2)**
This class is designed for students who have successfully completed PHED 146 Total Fitness I or PHED 212 Health and Fitness and desire to continue to utilize the Wellness Center while earning college credit. This is an individualized course which offers a continuation of exercise with a multi-stations aerobic super-circuit or a specialized individual program.
Prerequisites: PHED 145 or PHED 212 The average workout time for all stations including warm-up and cool down is 50 minutes. The course is taken for college-credit with a letter grade assigned.

147 HIGH INTENSITY INTERVAL TRAINING I **1 (0-2)**
This exercise class focuses on instructor–led, high intensity interval training activities with short recovery time periods between circuit stations. This is a non-traditional strength training class which will help participants in good condition to reach their full cardiovascular and muscular endurance potential. Equipment that will be used includes but is not limited to weighted ropes, sandbags, TRX Trainers, kettle bells, club bells and chains. Participants should be in good physical condition.

148 HIGH INTENSITY INTERVAL TRAINING II **1 (0-2)**
This exercise class is a continuation of PHED 147 High Intensity Interval Training I and focuses on instructor-led high intensity interval training activities with short recovery time periods between circuit stations. Participants should have experience with HIIT training and be in good physical condition.
Prerequisite: PHED 147

200 HEALTHFUL LIVING
FALL, SPRING, SUMMER **2 (1-1)**
The purpose of this course is to acquaint the student with concepts of wellness and the relationship between physical activity and optimal health and fitness. Topics include CV disease, exercise, nutrition, weight management, behavior modification, stress, cancer, addiction and sexually transmitted infections.

201 FOUNDATIONS OF PHYSICAL EDUCATION
FALL **3 (2-1)**
Orientation to physical education and recreation as a profession. Emphasis on basic philosophy, principles and interpretation of well-balanced programs. Skill readiness of professional students determined by testing program.

205 VOLLEYBALL OFFICIATING **1 (1-1)**
For male and female students; considers rules, game situations and officiating techniques. Students gain practical knowledge by officiating in organized athletic events.

209 INTRODUCTION TO COACHING SPORTS
FALL 3 (3-0)
Basic principles and theory of coaching; includes State Athletic Handbook, budgets, scheduling, equipment, administration and organization, conditioning, motivation, public relations, team selection, liability and athletic training.

210 ATHLETIC TRAINING SPRING 2 (1-2)
Knowledgeable background and experience in prevention, immediate treatment and rehabilitation of injuries commonly sustained by participants in athletics.
Prerequisite: E

212 HEALTH AND FITNESS
FALL, SPRING, SUMMER 3 (2-2)
This course combines classroom experience and personal exercise. Students establish knowledge of wellness, physical fitness, CV disease, nutrition, weight management, behavior modification, stress, cancer, addiction and sexually transmitted infections. Students implement an individualized exercise program and are required to exercise two days per week in the specified fitness center.

213 ORGANIZATION & ADMINISTRATION OF INTRAMURAL SPORTS 2 (2-0)
Philosophy, objectives, rules, policies, regulations and other administrative details of intramural programs. Covers tournament procedures and organization.

214 PERSONAL HEALTH FALL, SPRING 3 (3-0)
This course provides an understanding of the responsibility we have for our own health. Topics include CV disease, exercise, nutrition, weight management, behavior modification, stress, cancer, substance abuse, mental and emotional health, sexuality, contraception, infectious and non-infectious disease, personal safety, death and dying.

216 HEALTH ISSUES: STRESS MANAGEMENT
FALL, SPRING 2 (2-0)
Physiological responses to stress and developing techniques for better stress management.

217 HEALTH ISSUES: SELF-ESTEEM
FALL, SPRING 1 (1-0)
Assists in growth in ability to love and care for oneself and others. Techniques practiced daily to enhance self-esteem and variety of self-esteem issues presented.

218 HEALTH ISSUES: WEIGHT MANAGEMENT
FEE 1 (0-2)
This course consists of one session per week in the classroom setting to acquire an understanding of the physiology of fat gain and loss, the side effects of short term solutions and proper weight management techniques. Another session each week will include a support group atmosphere.
Prerequisite: Students must enroll in Total Fitness Center 145 OR 146 CONCURRENTLY with this class or acquire instructor's permission

PHYSICAL SCIENCE (PHSC)

101 PHYSICAL SCIENCE: CHEMISTRY AND PHYSICS
FALL, SPRING FEE 4 (3-2)
Provides students the opportunity to explore the connections of chemistry and physics as it relates to a variety of occupations. Integrated areas covered include the fundamental principles of light, sound, motion, energy, electricity, magnetism, states of matter, semiconductors, digital imaging, instrumentation components and block diagrams, and scientific conversion/units. This course will require some online work and out-of-class testing.
Prerequisite: E, R and MATH 095 (C or better), or a College assessment score qualifying for MATH 122 or higher

104 PHYSICAL GEOLOGY
FALL, SPRING 4(3-2)
Study of geologic processes. Topics include rock and mineral identification, topographic maps, plate tectonics and rock cycle, earthquakes and earth's interior, role of wind and water, glaciation, deserts, mass wasting, shorelines, resources, geologic time and astrogeology. Includes a two hour laboratory experience per week.
Prerequisites: E, M, R

180 PHYSICAL SCIENCE IN ELEMENTARY EDUCATION
FALL, SPRING 3 (2-2)
This is a laboratory-based course specifically designed for prospective elementary teachers. This course will aid students in developing meaningful and functional understanding of key physics concepts and their interrelations.
Prerequisites: E, M, R

190 EARTH SCIENCE FOR ELEMENTARY/MIDDLE SCHOOL TEACHERS I FALL3 (2-3)
A laboratory-based earth science course designed for pre-science elementary and middle school teachers. The intent of this course is to acquaint future teachers with the important concepts of earth science, and to provide the basic tools of independent, creative inquiry that teachers can take into the classroom. Emphasis will be given to study of the oceans, climate, weather, solar system and space. This course will explore the practice of science by incorporating inquiry-based activities into the pedagogy. This course is specifically designed to transfer to Western Michigan University's Elementary Education program and may not transfer to other institutions.
Prerequisites: E, M, R

205 WEATHER AND CLIMATE SPRING 4 (3-2)
This laboratory-based course provides students with the opportunity to investigate the causes and the characteristics of the Earth's weather and climate. Topics covered include: earth-sun relations, oceanic circulation, structure of the atmosphere, heating of the atmosphere and surface, global warming and the greenhouse effect, climate change, stability, moisture, cloud formation, precipitation, air pressure and wind, mid-latitude cyclones, global patterns of wind and precipitation, meteorological maps, severe weather, El Nino and La Nina, fronts and air masses, weather forecasting and the scientific process. Students are expected to have the ability to use the internet.
Prerequisites: E, M, R

280 PHYSICAL SCIENCE FOR ELEMENTARY TEACHERS II SPRING FEE 3 (2-3)
This is a laboratory-based course specifically designed for prospective elementary teachers. This course will aid students in developing meaningful and functional understanding of key physics concepts and their interrelations. This course is specifically designed to transfer to Western Michigan University's Elementary Education program and may not transfer to other institutions.
Prerequisites: E, M, R and computer literacy. PHSC 180 recommended

PHYSICS (PHYS)

101 GENERAL PHYSICS I FALL 5 (4-2)
Principles of Newtonian mechanics and kinetic theory. Recommended for Biology, Pre-Medical and Liberal Arts students. Includes a two hour laboratory experience per week.
Prerequisites: M, R, MATH 122 or MATH 128 concurrently or consent of instructor

102 GENERAL PHYSICS II SPRING 5 (4-2)
Principles of electricity and magnetism, light and modern physics. Continuation of Physics 101. Includes a two hour laboratory experience per week.
Prerequisite: PHYS 101

104 INTRODUCTION TO THE SKY AND SOLAR SYSTEM
FALL, SPRING FEE 4 (3-2)
Introduction to the night sky and our solar system including cycles of the Sun, Moon, planets and constellations; the historical development of astronomy; basic properties of light and telescopes; nature and properties of the planets and the Sun; asteroids, meteorites and comets; and the origin and evolution of the solar system. Includes laboratory component designed to illustrate and explore the topics covered. Includes a two hour laboratory experience per week.
Prerequisites: E, M, R, MATH 095

110 TECHNICAL PHYSICS FALL, SPRING 4 (3-2)
Topics from general physics for students pursuing a technical program; emphasis on matter, force, power, basic machines, torque, power transmission and topics from heat, sound and light. Includes a two hour laboratory experience per week.
Prerequisites: M, R, MATH 110 or MATH 128 or MATH 130 or MATH 135 with a grade of C or better

201 ENGINEERING PHYSICS I (MECHANICS)
FALL 5 (4-2)
Newtonian and Relativistic mechanics, kinetic theory and thermo-dynamics. Designed for Engineering, Mathematics, Physics and Chemistry transfer students. Includes a two hour laboratory experience per week.
Co-Requisite: MATH 201

202 ENGINEERING PHYSICS II (ELECTRICITY AND MAGNETISM) SPRING FEE 5 (4-2)
Electricity, magnetism and light for Engineering, Mathematics, Physics and Chemistry transfer students. Includes a two hour laboratory experience per week.
Prerequisite: PHYS 201

POLITICAL SCIENCE (POSC)

101 NATIONAL GOVERNMENT
FALL, SPRING, SUMMER 3 (3-0)
Examines the structure and operation of the national government, the meaning and practice of democracy, the various power relationships, civil liberties and civil rights, as well as the American method of conducting elections. The role of citizens and their choices is also examined.
Prerequisite: E, R

102 STATE GOVERNMENT
FALL, SPRING (SUMMER, ON DEMAND) 3 (3-0)
Examines political decision-making and public policies of state governments, with particular emphasis on Michigan. Analyzes both the relationships of states with the national government as well as each other, and contrasts policies and political structures in each state.
Prerequisites: E, R

202 COMPARATIVE GOVERNMENTS
SPRING (ODD YEARS) 3 (3-0)
Examines the similarities and differences that exist between the local governments, the public policies, the constitutions as well as the executive, legislative and judicial branches of key central (i.e., national) governments around the world. Particular emphasis is also placed on the literature that underscores the study of comparative governments.
Prerequisite: E, R

203 INTERNATIONAL RELATIONS
SPRING (EVEN YEARS) 3 (3-0)
Examines the relations that exist among nation-states. Particular emphasis is placed upon the factors/variables contributing to national power, the instruments used by nation-states to promote their own interests and the methods used to control interstate relations such as international law, balance of power arrangements, pacific settlement of disputes and international organizations.
Prerequisites: E, R

204 POLITICAL PARTIES FALL (EVEN YEARS) 3 (3-0)
Examines the development, organization, function and activities of major and minor political parties, pressure groups (e.g., interest groups) and election administration in the United States.
Prerequisites: E, R

250 INTRODUCTION TO SOCIAL SCIENCE RESEARCH (ON DEMAND) 3 (3-0)
Examines the research process, from development of hypotheses to report of findings. Research strategies include survey research, experimental designs, interviewing, observation and content analysis. For Social Science majors who plan to transfer.
Prerequisites: POSC 101 or HONR 141, POSC 102 OR HONR 143, with B or better or instructor permission

260 INTRODUCTION TO PUBLIC POLICY
FALL (ODD YEARS) 3 (3-0)
Examines current political topics within the public policy realm. The student is expected to grasp the issue and/or policy of concern and all of its complexities as well as appreciate its significance to modern everyday life. Topics will vary over time and will be drawn from either an American or international perspective.
Prerequisites: E; R; POSC 101 or HONR 141or POSC 102 or HONR 143, with a B or better or permission of instructor

PSYCHOLOGY (PSYC)

201 INTRODUCTION TO PSYCHOLOGY
FALL, SPRING, SUMMER 3 (3-0)
Description, understanding and control of human behavior. Two-fold aims: increase student ability to understand self and others and make a more satisfactory adjustment to life and the introduction to the field of Psychology.
Prerequisites: E, R

203 HUMAN DEVELOPMENT FALL, SPRING 3 (3-0)
Physical, cognitive, social and emotional development from conception through death. Emphasis upon factors influencing development of personality.
Prerequisite: PSYC 201 or HONR 121 with C or better

204 CHILD DEVELOPMENT AND PERSONALITY
FALL 3 (3-0)
Physical, social, intellectual and personality development from conception through adolescence. Emphasis upon factors influencing development of personality.
Prerequisites: E, R, PSYC 201 or HONR 121 with a C or better

205 INTERPERSONAL RELATIONS
FALL, SPRING 3 (3-0)
Interpersonal communication theory and practice to enhance effectiveness in interpersonal relations through better understanding of self and others. Topics include areas such as active listening behaviors, assertive confrontation and conflict resolution.
Prerequisites: E, R, PSYC 201 or HONR 121

206 SOCIAL PSYCHOLOGY SPRING 3 (3-0)
Topics related to social influences on the individual, emphasizing social psychological research.
Prerequisites: E, R, PSYC 201 or HONR 121 with a B or better

230 PSYCHOLOGY OF STEREOTYPING & PREJUDICE
FALL 3 (3-0)
Reviews theories and research on racial, ethnic and religious stereotyping and prejudice. Examines the developmental roots of these attitudes and beliefs and explores their emotional and behavioral consequences. Conscious and unconscious processes will be discussed. Participation in class will be strongly encouraged.
Prerequisites: E, R

231 ABNORMAL PSYCHOLOGY FALL, SPRING 3 (3-0)
Descriptions of cognitive, affective and behavioral disorders. Origins of specific disorders considered along with nature and problem of diagnosis and classification, and contemporary modes of treatment.
Prerequisites: E, R, PSYC 201 or HONR 121 with a C or better

250 INTRODUCTION TO SOCIAL SCIENCE RESEARCH
SPRING 3 (3-0)
Research process from development of hypothesis to report of findings. Research strategies include survey research, experimental designs, interviewing, observation and content analysis. For social science majors who plan to transfer. Prerequisites: E, R, PSYC 201 or HONR 121 or HONR 141with B or better or instructor permission.

RADIOLOGIC TECHNOLOGY (RADT)

130 INTRODUCTION TO RADIOGRAPHY FALL 3 (3-0)
Introduction to radiography. Topics covered include historical perspective of radiography, medical ethics, patient care and radiation protection.
Prerequisites: E, M, R, acceptance into Radiologic Technology program

131 RADIOGRAPHIC POSITIONING I FALL 6 (4-4)
Radiographic positioning nomenclature used in positioning. Radiographic positioning for chest, abdomen, pelvis, upper extremity, lower extremity and related pathology.
Prerequisites: E, M, R, acceptance into Radiologic Technology program

134 RADIOGRAPHIC PHYSICS FALL 4 (4-0)
Physics as related to the operation of x-ray equipment. Topics include atomic theory, x-ray properties, necessary unites of measurement, electricity and electromagnetism, basic electrical circuit components and electrical circuitry.
Prerequisites: E, M, R, acceptance into Radiologic Technology program

138 CLINICAL EXPERIENCE I SPRING FEE 2 (0-16)
Weekly 16-hour rotation through area hospitals during which student applies knowledge/skills learned in lecture and laboratory. Emphasis on patient care, communication and basic positioning skills.
Prerequisites: E, M, R, RADT 130, RADT 131, RADT 134, all with a grade of C or better

139 COMMON EQUIPMENT & PROCEDURES
SPRING 4 (4-0)
Investigates common equipment and procedures employed in diagnostic radiology. Topics include radiographic technique, x-ray production, scatter control, direct and indirect digital imaging equipment, fluoroscopy and film screens.
Prerequisites: E, M, R, RADT 130, 131, 134, all with a grade of C or better

140 RADIOGRAPHIC POSITIONING II
SPRING FEE 3 (2-2)
Routine positioning of thorax, vertebral column, special views of body and related pathology.
Prerequisites: E, M, R and RADT 130, 131, 134 all with a grade of C or better

141 CONTRAST STUDIES SPRING FEE 3 (2-2)
Anatomy and positioning of gastrointestinal, biliary, genitourinary systems and related pathology.
Prerequisites: E, M, R and RADT 130, 131, 134, all with a grade of C or better.

143 CLINICAL EXPERIENCE II
SUMMER FEE 3 (0-24)
Students continue to refine positioning skills from the first clinical semester, adding to their repertoire with positioning thorax, spine, lower extremity and contrast studies.
Prerequisites: E, M, R and RADT 138, 139, 140, 141, all with a grade of C or better

144 RADIOGRAPHIC POSITIONING III
SUMMER FEE 3 (2-2)
Radiographic positioning of skull, facial bones and sinuses and related pathology.
Prerequisites: E, M, R, RADT 138, 139, 140, 141, with a grade of C or better

145 RADIATION PROTECTION AND BIOLOGY
SUMMER FEE 2 (2-0)
Focuses on principles of interaction of radiation with living systems and radiation protection responsibilities of radiographer for patients, personnel and public.
Prerequisites: E, M, R, RADT 138, 139, 140, 141 all with a grade of C or better

228 COMPUTER APPLICATIONS IN MEDICAL IMAGING 3 (3-0)
Computer applications in the radiologic sciences related to image capture, display, storage and distribution. The content imparts an understanding of the components, principles and operation of digital imaging systems, image data management and data manipulation (post processing). Additional content provides basic concepts of patient information management including medical records management concerns and privacy and regulatory issues.
Prerequisites: E, M, R, RADT 143, 144, 145 all with a grade of C or better

229 CLINICAL EXPERIENCE III FEE 4 (0-32)
Supervised clinical practicum with emphasis on further gaining experience in fluoroscopy, portable radiography and trauma radiography. Students will be provided with some opportunities for observation in additional imaging modalities.
Prerequisites: E, M, R, RADT 143, 144, 145 all with a grade of C or better

232 CLINICAL EXPERIENCE IV
SPRING FEE 3 (0-24)
Students participate in a supervised clinical practicum which focuses on assisting transition into professional setting. In addition to diagnostic radiography, rotations may include observations in other imaging modalities.
Prerequisites: E, M, R and RADT 228, 229, all with a grade of C or better

240 RADIOGRAPHIC QUALITY SPRING 4 (4-0)
Lecture/lab course covering principles of radiographic image formation, quality assurance tests and technical variables that affect finished radiographs.
Prerequisites: E, M, R, RADT 228, 228 all with a C or better

241 SECTIONAL ANATOMY & MODALITIES
SPRING 3 (3-0)
This course provides an overview of transverse, coronal and sagittal sectional anatomy of the human body. Special emphasis is placed on a study of the head and brain, thorax, abdomen and pelvis. The shoulder, elbow, hip and knee are also examined. Correlations between sectional CT, MRI and ultrasound images and radiographs are explored. Other radiographic modalities likely to be encountered in a hospital setting are also introduced.
Prerequisites: E, M, R, RADT 228, 229 with a grade of C or better

250 COMPUTED TOMOGRAPHY: CT PRINCIPLES
FALL, SPRING, SUMMER 1 (1-0)
This course presents the essentials of CT for those seeking or beginning a career in CT. The interactive modules used in this course are online and self-paced within the semester offered. Academic credit can be applied to ARRT continuing education credits requirements. Internet connection and computer skills are required.
Prerequisite: Graduate of a Radiologic Technology Program with board eligibility, or, registration with the ARRT (American Registry of Radiologic Technologists), or meet Radiologic Technology Program Director approval

READING (READ)

083 READING STRATEGIES I
FALL, SPRING, SUMMER 4 (3-1)
Provides techniques and strategies to help develop college-level vocabulary and reading proficiency. Emphasis on learning and practicing a combination of reading skills to improve reading comprehension and fluency. Computer assisted instruction occurs in the Reading Center.
Prerequisites: Compass Reading of 0-67

087 READING IMPROVEMENT III
FALL, SPRING, SUMMER 4 (3-1)
Enables learners to acquire competencies needed for success in college courses. Emphasis on strategies necessary to deal with vocabulary required by college curriculum, content comprehension of college texts and other required readings, and ability to apply critical reading principals to reading materials. Computer assisted instruction occurs in the Reading Center.
Prerequisites: Compass Reading of 68 or ND 10.1 or READ 083 with a C or better

***093 SUPER SPEED READING I** **1 (0-2)**
Increases reading speed and comprehension. Utilizes individualized audio-visual techniques to fit needs, interests and abilities of student.

***096 VOCABULARY POWER**
FALL, SPRING **2 (2-0)**
Incorporates methods and strategies to develop vocabulary necessary to improve reading comprehension and communication skills.
Prerequisites: Compass Reading Score of 0-49 - Co-requisite with READ 093

101 STUDY SKILLS
FALL, SPRING, SUMMER **3 (1-2)**
Assists students in developing better study skills. Emphasis on practical study techniques, note taking, textbook marking, test taking skills and time management.
Prerequisite: R

SOCIOLOGY (SOC)

101 PRINCIPLES OF SOCIOLOGY
FALL, SPRING **3 (3-0)**
Principles of human association and interaction, with emphasis on interrelationship of heredity, environment, culture, groups and institutions in life of humans and society.
Prerequisites: E, R

201 MODERN SOCIAL PROBLEMS
FALL, SPRING **3 (3-0)**
Contemporary social problems and related rehabilitative and ameliorative resources and approaches in solving problems, with emphasis on problems of inter-group and inter-culture conflicts regarding differing beliefs and value systems.
Prerequisites: E, R

202 MARRIAGE AND THE FAMILY
SPRING **3 (3-0)**
Personal, social and cultural factors relating to pre-marriage and marriage; emphasis on interpersonal aspects of marriage, parenthood and family living in a changing world. Students with sophomore standing preferred.
Prerequisites: E, R

204 THE FIELD OF SOCIAL WORK
FALL, SPRING **3 (3-0)**
The study of social work as a professional field. The philosophy, function, employment opportunities, patterns of specialization and methods of social work are surveyed.
Prerequisites: E, R

205 RACE AND ETHNIC RELATIONS **3 (3-0)**
Studies of divisions among people along racial and ethnic heritages in today's American society. Includes various ethnic groups from five categories: 1) European ethnics; 2) Hispanic ethnics; 3) Asian ethnics; 4) historically American subjugated ethnics; and 5) socio-religious ethnic minorities.
Prerequisites: E, R

210 SOCIOLOGY OF AGING
FALL, SPRING, SUMMER **3 (3-0)**
The study of the socio-cultural, economic and physical aspects of aging in the United States and other societies with an emphasis on the diversity of the aging process.
Prerequisites: E, R

250 INTRODUCTION TO SOCIAL SCIENCE RESEARCH
SPRING **3 (3-0)**
Research process from development of hypotheses to report of findings. Research strategies include survey research, experimental designs, interviewing, observation and content analysis. For social science majors who plan to transfer.
Prerequisite: SOC 101 with B or better or instructor permission

TRADE RELATED INSTRUCTION (TRIN)

105 APPLIED TRIGONOMETRY II
FALL, SPRING **2 (2-0)**
Oblique angle trigonometry which incorporates law of sines, cosines, cotangents and right triangles in solving practical shop problems.
Prerequisites: M, R, MATH 110 OR TRIN 107

107 APPLIED GEOMETRY/TRIGONOMETRY
FALL, SPRING **4 (4-0)**
Second in series of applied mathematics courses that build upon concepts applicable to machine tool trades. Presents intermediate applications of geometry including propositions and axiom definitions, circles, areas, volume formulas and right angle trigonometry including right angles, interpolation and practical machining problem solving. Follows Duties and Standards for Level 1 Machining Skills as approved by National Institute for Metalworking Skills.
Prerequisites: MATH 100

129 ELECTRICAL CODE STUDY (ON DEMAND) **2 (2-0)**
Interpretation and application of State and National Electrical Code.
Prerequisites: M, R

134 METALLURGY AND HEAT TREATMENT
FALL SPRING **3 (3-0)**
Acquaints students with properties of metals and heat treating methods.
Prerequisite: M, R

138 INDUSTRIAL SAFETY FALL, SPRING **1 (1-0)**
Safety rules as applied to industry are discussed. OSHA standards and guidelines are presented.

143 INTRODUCTION TO MOLD MAKING
FALL, SPRING **3 (3-0)**
Course explains the "whys" underlying applied mold making and operation. Essential facts of cutting and forming operation are explained and related to the manner in which molds function. Primary mold components are discussed along with efficient working mold processes through films, videos and plant tours.
Prerequisites: M, R

144 BLUEPRINT READING & SKETCHING
FALL, SPRING 4 (3-1)
Basics of interpreting working drawings, tolerancing, machining symbols, fasteners, sections, auxiliary views, developments, piping drawing, material specifications, casting drawings, assembly drawings, welding drawings and machine elements. Offers approximately one hour of practical interpretive sketching each class period.

145 GEOMETRIC DIMENSIONING & TOLERANCING
FALL, SPRING 2 (2-0)
This course provides an in-depth study of interpreting geometric tolerancing as it is used on blueprints in today's industrial environment.
Prerequisite: TRIN 144

147 INTRODUCTION TO DIE MAKING
FALL FEE 3 (3-0)
Basic die construction facts around which a successful career in the field of die making can be established. Course will explain the "whys" underlying applied die making and operation. Essential facts of cutting and forming operation are explained and related in the manner in which dies function.
Primary die components are discussed along with efficient working die processes through films, videos and plant tours.
Prerequisites: M

156 INDUSTRIAL RIGGING SUMMER 2 (2-0)
Industrial specialty course for industrial maintenance trades and trades that require basic understanding of techniques, methods and materials needed to perform rigging tasks safely. Basic principles and practices for industrial rigging tools and load configurations, machinery moving, foundations, cranes and hoists, cable, chain and wire rope sling, inspection and maintenance documentation, and OSHA/MIOSHA standards.
Prerequisite: M

159 EMPLOYER-EMPLOYEE RELATIONS
SPRING 2 (2-0)
An introduction to human relations and self-management skills essential for a successful career. Covers some of the rights and responsibilities of the employer and employee and addresses topics to develop and improve employer and employee relations.
Prerequisites: E, R

243 ADVANCED DIE MAKING SPRING 3 (3-0)
Die press operation, advanced die construction and advanced applied diemaking practices. Focuses on inverted, compound and progressive dies, secondary operations and drawing operations. Films, video and plant tours provide exposure to working die processes.
Prerequisites: M, R, MACH 110, TRIN 144, TRIN 147

VITICULTURE (VITI)

110 ESTABLISHING A VINEYARD SPRING 3 (2-2)
This course is an introduction to the practices for establishing a vineyard. Topics covered include site selection, the use of climatological data, vine varieties, soil preparation, vineyard layout, equipment and planting methods.
Prerequisites: E, M, R

120 MAINTAINING A VINEYARD SUMMER 3 (3 – 0)
This course is designed to give the student a working knowledge to successfully take a producing vineyard from bud break to harvest. Topics covered include canopy management, weed control, irrigation, pest treatment and disease prevention.
Prerequisites: E, M, R, VITI 110

220 VINEYARD DISEASES AND INSECTS
SUMMER 3 (3-0)
This course is an introduction to the identification, life cycles and control of insects and diseases common to grape crops. It focuses on the fundamentals of entomology and plant pathology.
Prerequisites: E, M, R and BIOL 120

290 VITICULTURE CO-OP I SPRING 1 (1-15)
This work-based course offers hands-on learning while working at a selected vineyard and receiving supervision from a professional viticulturist. Work site hours may vary. Permission of Wine and Viticulture Technology lead faculty is required.
Prerequisites: E, M, R

291 VITICULTURE CO-OP II SUMMER 2 (2-100)
This work-based course offers hands-on learning while working at a selected vineyard and receiving supervision from a professional viticulturist. Work site hours may vary. Work site approval by instructor is required.
Prerequisites: VITI 290

292 VITICULTURE CO-OP III SUMMER 1 (1-15)
This work-based course offers hands-on learning while working at a selected vineyard and receiving supervision from a professional viticulturist. Work site hours may vary. Permission of Wine and Viticulture Technology lead faculty is required.
Prerequisites: E, M, R, VITI 290, VITI 291

WELDING (WELD)

101 FABRICATION I FALL, SPRING 2 (2-1)
Covers punching, shearing, sawing, drilling and cutting. Sub-assembly parts are produced using various equipment. The parts may be joined, by welding, to complete an assembly. Students work in a team environment to complete an assignment.

102 SHIELDED METAL ARC WELDING I (SMAW)
FALL, SPRING 2 (2-1)
Covers the process commonly known as stick welding. Upon completion of this course, the student will be able to weld in all positions, read some basic weld symbols and have a basic understanding of written welding procedures.

103 GAS METAL ARC WELDING I (GMAW)
FALL, SPRING 2 (2-1)
Demonstrates welding on steel sheet metals and plates. Emphasis is placed on axial spray, pulse spray and short circuit mode of transfer. Upon completion of this course, the student will be able to weld in all positions, read basic weld symbols and have an understanding of written welding procedures.

104 WELDING BLUEPRINT READING & SYMBOLS
FALL, SPRING 2 (2-1)
Provides practice in reading blueprints. Topics include orthographic projection, auxiliary views, revolved sections, surface and centerline relationships, scale drawing and tolerances. The student interprets detailed weld symbols using the American Welding Society standard.

105 WELDING FABRICATION I FALL, SPRING 2 (2-1)
Allows students to fabricate a part from a blueprint and weld the assembly with a specified welding process. Cutting and forming may be required prior to assembly. Depending on the size and complexity of the project, students may be asked to work in a team to complete an assignment.
Prerequisites: WELD 101 or INMT 109 and WELD 104 or INMT 110 all with a C or better

106 WELDING METALLURGY FALL, SPRING 2 (2-0)
This course is to assist those in welding or related industries to extend their knowledge of metals during welding. The main emphasis is placed on reasons for the various behavioral characteristics of metals. The course will focus on fundamental welding processes and manufacture of steel, structure and metallurgical changes of metals during welding, physical and mechanical properties, stresses, stress relief and annealing and weldability of steel and alloys.
Prerequisites: WELD 101, WELD 104 with a C or better

200 WELDING FABRICATION II
FALL, SPRING 2 (2-1)
Allows students to fabricate and weld parts from a simple sketch that requires mathematical calculations. Cutting and forming may be required prior to assembly. Depending on the project, students may be asked to work in a team to complete an assignment. As time allows, students may also design and fabricate an individual project.
Prerequisites: WELD 105 with a C or better

201 GAS METAL ARC WELDING (GMAW) II
FALL, SPRING 2 (2-1)
Teaches students to weld on stainless steel and aluminum sheet metal and plate. The student will be able to differentiate, select proper electrodes, shielding gases and properly adjust parameters. Emphasis is placed on axial spray, pulse spray and short circuit mode of transfer depending on base metal. Upon completion of this course, the student will be able to weld in all positions, read some basic weld symbols and have a basic understanding of written welding procedures.
Prerequisites: WELD 103 or INMT 110 with a C or better

202 GAS TUNGSTEN ARC WELDING (GTAW)
FALL, SPRING FEE (2-1)
Includes study and operation of primarily gas tungsten arc welding on some mild steel, with the majority of work on stainless steel and aluminum. Students will learn about the different types of electrodes and shielding gases used in these processes. Students will be able to weld in all positions, read some basic weld symbols and have a basic understanding of written welding procedures.

203 GAS METAL ARC WELDING (GMAW) PRODUCTION
FALL, SPRING 2 (2-1)
An emphasis on metal cored and flux cored electrodes. The main focus is skill enhancement to set standards set forth in AWAS and steel building construction codes. The testing will consist primarily of 0.375" and 1.00" carbon steel in the 3G and 4G positions.
Prerequisites: WELD 103 or INMT 109 and WELD 201 or INMT 110 with a C or better

204 SHIELDED METAL ARC WELDING (SMAW) PRODUCTION
FALL, SPRING 1 (1-2)
A continuation of SMAW Welding I (WELD 102). The primary emphasis will be in the use of E6010, E7018 and E8018 electrodes within the parameters set forth in the various welding codes. The students will enhance skills to standards set forth in AWS, ASME and steel building codes. The testing will incorporate 3G and 4G positions with both carbon steels and stainless steels.
Prerequisites: WELD 102 or INMT 109 with a C or better

205 GAS TUNGSTEN ARC WELDING (GTAW) PRODUCTION
FALL, SPRING 1 (1-2)
A continuation of GTAW Welding (WELD 202). The primary emphasis will be in the use of the various tungsten electrodes being used in industry. The main focus is skill enhancement to standards set forth in AWS, ASME and API codes. The students will be tested in the 3G and 4G plate positions in steel applications, with the greatest emphasis being in the 5G and 6G positions using thin wall stainless steel pipe and tubing and aluminum plate less than 0.315" thick.
Prerequisites: WELD 202 with a C or better