

COURSE DESCRIPTIONS

Understanding Course Descriptions

The course descriptions on the following pages are in alphabetical order by subject and each course appears in numerical order. The following diagram will help you understand each part of a course description.

1 BUS 123 **2** PRINCIPLES OF ACCOUNTING I **3** **4(4-0)**

4 Normally Offered: F

5 Stresses the basic concept of accounting and financial reporting. The accounting cycle is presented, followed by discussion of current assets and liabilities, fixed assets and related depreciation methods, and systems of internal control and electronic data processing. Practice in accounting skill is obtained through the recording of transactions and preparation of financial statements.

6 **Corequisite:** BUS 125 or MTH 102 or MTH 113 or MTH 121 or MTH 122 or MTH 123 or MTH 130 or MTH 131 or MTH 132 or MTH 223 or MTH 231 or MTH 232.

1. Subject abbreviation & course number — This is a Business Administration course, freshman level. Freshman courses are numbered 101-199; they may be elected by sophomores. Courses numbered 200-298 are sophomore courses; they may be elected by freshmen with the necessary prerequisites. Courses numbered under 100 may count toward the Associate in General Studies, but not toward any other degree.
2. Course Title
3. Credit & Contact Hours — Course credit hours are listed first, followed by the total contact hours in parentheses. These are the hours the class meets each week for lecture, laboratory work, and recitation. This example shows a four-credit course that meets four hours a week in lecture, with no lab hours or recitation, so it has 4 contact hours. A course showing 4(3-1-3) is a four-credit course that meets three hours a week in lecture, one hour a week in lab and three hours a week in recitation, for a total of 7 contact hours. Tuition is charged on contact hours.
4. Normally Offered — Tells when the course is scheduled. There are two semesters and a summer session: Fall Semester (F), Spring Semester (SP), or Summer Session (SUM).
5. Course Description — This describes the content of the course.
6. Prerequisite/Co-requisite — To enroll, you must have successfully completed any course(s) or meet other requirements listed as prerequisite(s). This assures your ability to work at the level required in the course. Co-requisites are courses you must take during the same semester.

Course numbers, titles, credit hours, contact hours, and descriptions are subject to change. Use this catalog along with the semester schedule.

COURSE DESCRIPTIONS LISTINGS

ANTHROPOLOGY

ANP 121 CULTURAL ANTHROPOLOGY 3(3-0)

Normally Offered: F, SP

Introduces the comparative study of human adaptations. Cultural patterns ranging from band to modern nations are considered. Emphasis is given to the dynamic nature of culture by using the record of prehistory, history and contemporary societies.

ANP 229 ANTHROPOLOGY OF THE NORTH AMERICAN INDIAN 3(3-0)

Normally Offered: SP (even years)

This survey course covers culture areas and culture types, one representative Native American group from each culture area at the time of contact, the current status of each representative group, Pan-Indian Cultural Tracks, and current Native American issues.

ANP 239 RELIGIONS OF THE WORLD 3(3-0)

Normally Offered: F (odd years)

Introduces the major religions of the world on a comparative basis. Original sacred documents will be read and underlying cultural assumptions studied. Objective is to develop an appreciation for the wide variety of religious experience and organization that exists in the world today. Student will come into contact with a wide variety of traditions ranging from the indigenous religious traditions of the United States to those of Buddhism, Hinduism and the world of Islam.

ANP 240 ARCHAEOLOGY 3(.5-3.5)

Normally Offered: SU

Introduction to field and laboratory archaeology methods. Students will participate in field survey and site excavation in the Alpena area. Excavation control, photography, and recording is emphasized. Artifact analysis and cataloging done when weather limits field activity.

ANP 257 UNDERWATER ARCHAEOLOGY 3(3-0)

Normally Offered: On Demand

This course will provide students with an introduction to theory, method, technologies, and practice in underwater archaeology, with a focus on prehistoric and historical sites, worldwide and in the Great Lakes, inland lakes, and streams of the State of Michigan. Course content will draw primarily from anthropology and the applied social or behavioral sciences.

Prerequisite: ANP 121 or permission of instructor.

APPRENTICE -- ELECTRICAL

APP 100E ELECTRICAL STUDIES FOR TRADES 3(2-2)

Normally Offered: F, SP

An introductory course covering the fundamentals of electricity. Lecture topics include magnetism, Ohm's Law, capacitance, inductance, three-phase power, transformers, and motors. Students work in a lab environment to measure voltage, current, resistance, and power using both DC and AC circuits.

Prerequisite: One year of high school algebra.

APP 102E RESIDENTIAL WIRING & BLUEPRINT READING 3(2-2)

Normally Offered: SP

Course content includes residential wiring and blueprint reading in an organized manner.

Prerequisite: APP 100E, MTH 110.

APP 103E COMMERCIAL & INDUSTRIAL WIRING 3(2-2)

Normally Offered: F

Course content includes commercial and industrial applications of alternating current with applicable blueprint reading.

Prerequisite: APP 100E.

APPRENTICE – ELECTRICAL

APP 104E AC & DC FUNDAMENTALS 3(2-2)

Normally Offered: SP

Course content includes commercial and industrial applications of alternating current, DC motors, generators and direct current as applied to resistive networks in series, parallel and combination circuits.

Prerequisite: APP 100E, MTH 110.

APP 107E SPECIALTY WIRING 3(2-2)

Normally Offered: F

Course content includes low-voltage wiring methods, structured cabling for computer network and telephone systems, fiber optic wiring, CCTV security systems, fire alarm system operation and troubleshooting, medium-voltage and high-voltage wiring methods and terminations.

Prerequisite: APP 100E, MTH 110.

APP 111E ELECTRIC MOTOR CONTROL 3(2-2)

Normally Offered: F

Course content includes motor control circuit layout theory and advanced motor control applications.

Prerequisite: APP 100E, MTH 110, or permission of instructor.

APP 114E PROGRAMMABLE CONTROLLERS 3(2-2)

Normally Offered: SP

Course content includes programmable controller operations, programming, and their applications in industry.

Prerequisite: APP 100E, MTH 110, or permission of instructor.

APP 115E NATIONAL ELECTRIC CODE APPLICATION 4(4-0)

Normally Offered: SP

A comprehensive study of the National Electric Code and its application to ensure a safe and adequate electrical installation. Specific Michigan code requirements and contractor requirements will be covered as well. Capstone course of apprentice electrical program and excellent preparation for State Journeyman or Master Electrician exam.

Prerequisite: APP 102E, APP 100E, APP 103E, or permission of instructor.

APP 122E DIGITAL ELECTRONICS FOR ELECTRICIANS 3(2-2)

Normally Offered: F

Familiarizes the student with the basics of digital electronics. Topics covered will be numbering systems (binary, octal, hexadecimal), converting from and to base 10, binary arithmetic. Gate, AND, OR NOR, NAND, and XOR and the Boolean Algebra equivalent computer addressing. Adder and subtractor counter, registers and converters. The laboratory will use TTL devices and troubleshooting will be stressed in the laboratory.

Prerequisite: Linear Electronics for electro-mechanical technicians or satisfactory grade on placement test or instructor permission.

APP 123E LINEAR ELECTRONICS FOR ELECTRICIANS 3(2-2)

Normally Offered: SP

Stresses, in the laboratory, trouble shooting techniques of electronic circuits. Topics covered will be diode theory and uses in rectification; zener diodes and voltage regulation; bipolar transistors in the three configurations; suspended power supplies; field-effect transistors; operational amplifiers; soldering techniques; and component identification.

Co-requisite: APP 100E.

APPRENTICE -- MILLWRIGHT

APP 106M INDUSTRIAL SAFETY 1(1-0)

Normally Offered: F, SP

Orients students to items related to safety in the work place. Topics will include accident statistics and costs, personal safety, proper and safe selection and use of tools and material handling, equipment, and fire safety.

APPRENTICE -- MILLWRIGHT

APP 121M APPRENTICE BLUEPRINT READING3(2-2)
Normally Offered: F

This course provides the student with a basic working knowledge of the alphabet of lines, three-view drawings, arrangement of views, and orthographic projection. Provides the student with a basic working knowledge of section views, dimensions, tolerances, and shop sketching.

APP 122M MACHINE REPAIR3(2-2)
Normally Offered: SP

This course provides the student with a basic working knowledge of principles of mechanical power transmission, belt drives, bearings, couplings, packing and seals, mechanical fasteners, pipe fittings, and pipe valves.

APP 124M APPRENTICE HYDRAULICS3(2-2)
Normally Offered: F

This course introduces the student to the principles and maintenance practices of power hydraulics and provides the student with a basic working knowledge of hydraulic fluids, piping, seals, reservoirs, actuators, directional controls, volume controls, pumps circuits, and graphical schematics.

APP 125M APPRENTICE MACHINE SHOP3(2-2)
Normally Offered: SP

Students will receive instructions on shop safety, measuring instruments, layout tools, lathes, milling machines, grinders, saws, the physics of metal cutting (speeds and feeds), and cutting tool materials.

APP 128M RIGGING & WEIGHT ESTIMATING 1.5(1-1)
Normally Offered: F

Provides the student with the basic working knowledge of rigging and weight estimating.

APP 129M APPRENTICE PNEUMATICS 1.5(1-1)
Normally Offered: F

This course provides the student with a basic working knowledge of pumps, air compressors, and pneumatics.

APP 223M PREDICTIVE & PREVENTATIVE MAINTENANCE3(2-2)
Normally Offered: F

A proactive approach to maintenance practice stressing the importance of Total Predictive Maintenance (TPM) Management, which increases productivity and quality, reducing failure and downtime.

ART

ART 100 PHOTOGRAPHY I.....3(2-2)
Normally Offered: F, SP

This course offers an introduction to the basic technical skills of photography as a creative medium for personal expression. Students must provide a 35mm and/or a digital camera.

ART 123 DESIGN I3(0-4)
Normally Offered: F, SP

Promotes concern for the structure of environment and for the structure of contemporary graphic communication. This foundation course develops the student's ability to perceive and to sense the potential of various materials with regard to two-dimensional translation.

ART 124 DESIGN II3(0-4)

Normally Offered: F, SP

Promotes concern for developing perception of environment, but the emphasis is on the three-dimensional aspects of design and structure.

Prerequisite: ART 123 or permission of instructor.

ART

ART 127 BASIC DRAWING I 3(0-4)

Normally Offered: F, SP

Approaches drawing through development of awareness and knowledge and experience of art elements (space, line, shape, texture, value, and color). It develops confidence and ability to draw through varied drawing activities (contour, gesture, upside-down, memory, life, and perspective). The use of varied media (ex. pencil, charcoal, India ink, markers, watercolor), knowledge of styles and techniques will intermix with artists of the past and artists of today, and the opportunity to express one's self.

ART 128 BASIC DRAWING II 3(0-4)

Normally Offered: SP

Continues ART 127, Basic Drawing I and the drawing process with emphasis on creativity, originality and message within production; also, more emphasis on observing and drawing the human form, proportion and perspective.

Prerequisite: ART 127 or permission of instructor.

ART 200 PHOTOGRAPHY II 3(2-2)

Normally Offered: F, SP

During this course students will draw on skills learned in Photography I. Student will explore various subjects and styles by variations of their own work and the study of works by other photographers. Emphasis will be put on developing a unique insight into the subject and processes of photography. Projects will consist of "shooting assignments" that have been developed to aid students in "polishing" their skills and sharpening their awareness of the visual world around them.

Prerequisite: ART 100.

ART 221 COMPUTER GENERATED IMAGES I 3(0-4)

Normally Offered: F, SP

This course is intended to introduce the student to the image editing capabilities of a computer program called Adobe Photoshop. Using this program and either a Macintosh computer or Windows PC (in-class work will be done on Macintosh computers), student will be able to manipulate, repair and enlarge existing photographs or create images completely within the computer itself. Students will also create original images from "composite photos" and use the program's ability to generate images that may not necessarily "exist in reality."

ART 222 COMPUTER GENERATED IMAGES II 3(2-2)

Normally Offered: F, SP

During this course students will continue to hone skills learned in CGI I as well as being introduced to more advanced techniques. Assignments will be developed with the input of the student and instructor to develop skills that will allow each individual student to achieve their desired goals.

Prerequisite: ART 221.

ART 223 PAINTING I 3(0-4)

Normally Offered: F, SP

Considers basic problems and methods of dealing with painting. Emphasis is on various media, techniques, composition and expression. Students explore watercolor, acrylic and oil paint.

ART 224 PAINTING II 3(0-4)

Normally Offered: SP

Continues and expands use of materials and techniques of Painting I and painting primarily in medium of choice or combination of media. Emphasis is on skill development in medium, knowledge of color, creativity and originality.

Prerequisite: ART 223 or permission of instructor.

ART 225 CERAMICS I3(0-4)

Normally Offered: F, SP, SU

Presents the aesthetic but focuses on technical know-how regarding the art of hand built ceramics. Students are provided with aesthetic challenges of material and form.

ART

ART 226 CERAMICS II3(0-4)

Normally Offered: F, SP (Individual Study)

Continues Ceramics I, with more emphasis on throwing than hand-built forms. Students experiment with different clay bodies and glazes. Functional forms dominate the course, but improvised forms are encouraged.

ART 229 SCULPTURE I3(2-2)

Normally Offered: F, SP

Each student will be exposed to a number of traditional processes used to create three-dimensional art. Each process will introduce the student to a different aspect of sculpture, giving the student a well-rounded 3-D experience. Exploring 3-D form and space through individual creative experiences working with various sculpture media.

ART 230 SCULPTURE II3(2-2)

Normally Offered: F (Individual Study), SP (Individual Study)

Each student will be exposed to a number of traditional and nontraditional processes to create three-dimensional forms that build on techniques, skills, and methods learned in Sculpture I. Through visual exploration of other artists' work, students will gain insight into the ideas and concepts involved in creating sculpture.

ART 233 PAINTING III3(0-4)

Normally Offered: F (Individual Study), SP (Individual Study)

Continues Painting II, with greater emphasis on the development of idea and the exploration of content and media. Students work with unconventional materials (colored ferro concrete, fiberglass, foam rubber, etc.) and traditional materials.

Prerequisite: ART 224 or instructor consent.

ART 234 PAINTING IV3(0-4)

Normally Offered: F (Individual Study), SP (Individual Study)

Continues Painting III, but students concentrate on selected media, personal direction and experimentation.

ART 235 CERAMICS III3(0-4)

Normally Offered: F (Individual Study), SP (Individual Study)

Continues Ceramics II, however, closer tolerances are required with regard to covered containers and uniformity of repeat forms. Combined (thrown and hand-built) sculptural designs are encouraged. Students develop new glazes using three basic oxides and compounds.

ART 236 CERAMICS IV3(0-4)

Normally Offered: F (Individual Study), SP (Individual Study)

Continues Ceramics III, with emphasis on developing self-direction. The students extend themselves aesthetically and technically without sacrificing the constants (definition of a craft).

While meaningless experimentation and gimmicks are discouraged, students are rewarded for efforts in personal expression that are sound, with regard to aesthetics and craftsmanship.

ART 246 ART FOR THE CLASSROOM TEACHER 4(2-2)

Normally Offered: F

This course is for future elementary teachers who will learn to create an artistic environment in the regular classroom. Visual arts will be associated or connected with various areas of the curriculum. Students will learn that every child learns by a variety of techniques and methods. Students will be expected to use and develop their creative abilities and continually adapt to various ages and skill levels. A variety of techniques and materials will challenge students as possible lessons are selected.

ART

ART 260 PORTFOLIO 3(2-2)

Normally Offered: F, SP

This course is intended to be a capstone for graduating students that wish to organize a body of their existing artwork into a presentable portfolio. Throughout the semester, the student and instructor will work closely in a one-on-one format. Additionally, the student will be required to research potential four-year institutions that they may want to attend. Several field trips or visits will be planned.

Prerequisite: Advisor's recommendation.

ART 261 ADVANCED COMPUTER GENERATED IMAGES – GENERAL 3(2-2)

Normally Offered: F, SP, SUM

This course is intended to be an in-depth exploration of the computer program Adobe Photoshop as an expressive tool for the artist.

Prerequisite: ART 221, ART 222.

ART 262 ADVANCED COMPUTER GENERATED IMAGES – DIGITIZING TABLET 3(2-2)

Normally Offered: F, SP, SUM

This course is intended to be an in-depth exploration of the techniques involved in the use of the digitizing tablet as an expressive tool for the artist.

Prerequisite: ART 221.

ART 263 DESIGN III 3(2-2)

Normally Offered: F, SP

This course is intended to be an in-depth exploration of the techniques, materials, and concept development involved in the technical skill and creative productivity of Design I and Design II.

Prerequisite: ART 123, ART 124.

ART 264 DESIGN IV 3(2-2)

Normally Offered: F, SP

This course is intended to be an in-depth exploration of the concept development and content development involved in the creation of 2D and 3D design. This is primarily a course for students enrolled in the Fine Arts program who are interested in adding and building portfolio content and refinement for transfer from an associate level to a baccalaureate.

Prerequisite: ART 263.

AMERICAN SIGN LANGUAGE

ASL 121 AMERICAN SIGN LANGUAGE 4.0(4-0)

Normally Offered: F

This course introduces the basics of American Sign Language (ASL) and is designed for students who have little or no previous knowledge of ASL. The focus of the class will be on vocabulary, fingerspelling, numbers and grammatical non-manual signals. Students will also be exposed to Deaf Culture, and hot topics within the Deaf Community.

ASL 122 AMERICAN SIGN LANGUAGE II 4.0(4-0)

Normally Offered: SP

This course continues to introduce the basics of American Sign Language (ASL) and is designed for students who have completed ASL 121, or similar course work. The focus of the class will be on vocabulary, fingerspelling, sentence structure and grammatical non-manual signals. Students will also be exposed to Deaf Culture, and hot topics within the Deaf Community.

Prerequisite: ASL 121 or instructor approval

AUTOMOTIVE

AUB 100 AUTO COLLISION FUNDAMENTALS.....2(1-2)

Normally Offered: F

This course orients the student to the auto body collision repair trade. Both classroom and lab are used to present topics of certification and careers, personal safety and hazardous materials, terminology, shop operation, tools and equipment, service information, and refrigerant recovery.

AUB 105 COLLISION WELDING.....2(1-2)

Normally Offered: F

This course gives the student experience in welding processes that are currently being used in collision repair. These processes include, MIG Pulse Steel, Aluminum and Bronze, Resistance Spot Welding, Oxy-Acetylene uses, and Plasma Arc Cutting.

AUB 110 PAINT PREPARATION.....2(1-2)

Normally Offered: F

This course provides the student with the fundamental knowledge and manual skills that are the basis for all automotive refinishing. Topics include refinish safety and equipment, panel preparation, and masking and detailing. Mastery of these skills prepare students for entry level employment as a painter's helper.

AUB 115 PAINTING4(2-4)

Normally Offered: F

This course provides an introduction to refinish shop procedures. Students will learn to apply both solvent and water borne materials. An emphasis will be placed on spraying undercoats, top-coats, and clear coats. Students will practice color sanding and wheeling techniques used to remove paint defects and match OEM surface appearance.

Prerequisite: AUB 100.

AUB 120 INTRODUCTION TO NON-STRUCTURAL REPAIR.....2(1-2)

Normally Offered: F

This course will allow the student to begin developing the skills of a non-structural technician. In the lab students will practice safe removal and replacement of bolt-on parts, trim and hardware, and moveable glass. Emphasis will be placed on proper part alignment and operation

Prerequisite: AUB 100 or instructor permission.

Co-requisite: AUB 125.

AUB 125 NON-STRUCTURAL REPAIR3(1-4)

Normally Offered: F

This course provides the students with the fundamental knowledge and manual skills necessary to repair non-structural damage on late model automobiles. Topics covered include metal-finishing, body fillers, adhesives, and plastic and composite repair.

Prerequisite: AUB 100 or instructor permission.

Co-requisite: AUB 120.

AUB 130 MECHANICAL AND ELECTRICAL REPAIR4(2-4)

Normally Offered: SP

This course provides the student with the necessary knowledge and skills to safely perform common collision related repairs. Topics covered will include restraint systems, cooling systems, heating and air-conditioning systems, brakes, steering and suspension, basic electrical theory diagnosis and repair, and hybrid and electrical vehicle safety.

Prerequisite: AUB 100 or instructor permission.

AUTOMOTIVE

AUB 135 DAMAGE ANALYSIS AND ESTIMATING3(1-4)

Normally Offered: SP

This course provides instruction in collision theory, damage analysis, and measurement of unibody and full-framed vehicles. Students will measure damage using computerized measuring equipment, develop a repair plan, and learn computerized estimating.

Prerequisite: AUB 100 or instructor permission.

AUB 140 ADVANCED COLLISION4(2-4)

Normally Offered: SP

This course will provide instruction and lab activities performing advanced repairs, including welded and bonded panel repair and replacement, automotive foams, and restoring corrosion protection.

Prerequisite: AUB 105.

AUB 150 ADVANCED PAINTING5(2-6)

Normally Offered: SP

This capstone course will build on skills learning in AUB 110 and AUB 115. Students will perform advanced paint repairs including, blending, spot repairs, tri-coat finishes and correcting paint problems.

Prerequisite: AUB 100 or instructor permission.

AUT 119 AUTOMOTIVE BRAKE SYSTEMS.....5(2-6)

Normally Offered: F

Provides the student with knowledge and skills to maintain, diagnose, and repair automobile and light truck braking systems. Brake operating principles, construction, maintenance, machining, and overhaul procedures will be covered. Antilock brakes and the related systems of traction control and stability control and the liability one undertakes in servicing these systems will be covered as well. Practical knowledge will be gained by working on live vehicles in the lab.

Prerequisite: Placement in ENG 111 and MTH 110 or instructor permission.

AUT 122 AUTOMOTIVE AIR, FUEL & EMISSIONS SYSTEMS.....4(2-4)

Normally Offered: SU

This course is designed to provide the student with an understanding of the theory, construction, operation, diagnosis, and repair of automotive fuel and emission systems. Environmental, safety, and legal concerns will be emphasized. Alternative fuel concepts will also be explored.

Prerequisite: AUT 124 with a grade of 2.0 or higher or instructor approval.

AUT 123 AUTOMOTIVE SUSPENSION, STEERING & ALIGNMENT5(2-6)

Normally Offered: F

Acquaints the student with operating principles and nomenclature of the various suspension and steering components. Both manual and power steering components will be studied. Alignment geometry and suspension dynamics and wheel/tire balance will be studied. Emphasis will be placed on the diagnosis and repair of suspension, steering, and alignment problems.

Prerequisite: Placement in ENG 111 and MTH 110 or instructor permission.

AUT 124 AUTOMOTIVE ELECTRICAL & ELECTRONICS SYSTEMS I.....5(2-6)

Normally Offered: F

Provides the student with the essential technical knowledge and manual skills to diagnose, repair, and maintain automotive electrical and electronic systems. Electrical theory, circuit types, wiring repair, reading electrical schematics and diagrams, electrical measurements, magnetism, electromagnetism, and use of diagnostic equipment will be covered.

Prerequisite: Placement in ENG 111 and MTH 110 or instructor permission.

AUTOMOTIVE

AUT 125 AUTOMOTIVE ELECTRICAL & ELECTRONICS SYSTEMS II.....5(2-6)

Normally Offered: SP

Takes the student who has a basic automotive electrical background into a deeper understanding of automotive electrical systems. Lighting systems, horns, warning devices, instruments, accessories and body electrical, including air bags, anti-lock brakes, power windows, locks and keyless entries, are studied. Much time is spent on diagnosis, repair and installation of these systems.

Prerequisite: AUT 124 or instructor permission.

AUT 201 COMPUTERIZED ENGINE CONTROLS4(2-4)

Normally Offered: SP

Provides the student in lecture and lab with the theory and operating principles of computerized engines. Reviews electrical and electronic principles, computer operation, and common computer components, followed by more in-depth studies of GM, Ford and Chrysler systems. The course concludes with an update as to what has been done during the last two years, along with a look at what is coming in the future.

Prerequisite: AUT 124 or instructor permission.

AUT 202 ENGINE PERFORMANCE DIAGNOSIS & TUNE-UP.....5(2-6)

Normally Offered: SP

Provides the student with information that integrates the understanding of mechanical automotive systems with the myriad electrical systems that current automobiles employ. Study will also include gaining an understanding of operation, service, diagnosis, and repair of automobile ignition systems.

Prerequisite: AUT 124 with a grade of 2.0 or higher or instructor permission.

AUT 205 AUTOMOTIVE CLIMATE CONTROL3(2-2)

Normally Offered: SU

Provides the student with theory operating principles of various automotive climate control systems. Problem diagnosis and repair of compressors, refrigerant controls, and electric circuit controls will be covered. Safety will be stressed and charging and servicing units of live vehicles will be practiced.

AUT 209 AUTOMOTIVE TRANSMISSIONS & DRIVE TRAINS5(2-6)
Normally Offered: SP

Provides the student with instruction and practice in maintenance, diagnosis, and repair of automatic and manual transmission, clutch systems, transfer cases, and general drive trains. Operating principles and concepts of power flow will be emphasized.

Prerequisite: Successful completion of AUT 124 or instructor permission.

AUT 221 ENGINE REPAIR & OVERHAUL.....5(2-6)
Normally Offered: F

Introduces the design and construction of the various automotive power plants. Engine mechanical system diagnosis and service procedures, with emphasis on spark ignition engines, are studied. Disassembly, inspection, measurement, reconditioning, and reassembly of the various engine components are practiced. Use of proper service procedures are stressed both in the classroom and lab. Students are expected to complete at least one engine overhaul assignment.

AVIATION

AVI 135 UAS PILOT EXAM PREP 1(.75-.5)
Normally Offered: SP

FAA regulations require all commercial UAS operators to pass an aeronautical knowledge certification exam. Unmanned Aerial Systems (Drone) Pilot Exam Prep is open to anyone interested in becoming a commercial UAS Pilot, regardless of industry application, and will prepare students to sit for the FAA Exam (offered at testing sites throughout the state). This course will cover National Airspace, maps, weather, operations and inspections, and professional and ethical behavior in the aviation industry. This is not a hands-on operations course, but will provide minimal instruction on operating systems.

AVIATION

AVI 136 UAS OPERATIONS AND SAFETY 1(.5-1)
Normally Offered: SP

Unmanned Aerial Systems (Drone) Operations and Safety is open to anyone interested in a hands-on experience with UASs. Students will learn using a hands-on approach to conduct preflight inspections, program the platforms, and complete successful missions.

AVI 137 UAS PAYLOADS AND PROCESSING 1(.5-.75)
Normally Offered: SP

Unmanned Aerial Systems (Drone) Payloads and Processing introduces students to different types of payloads designed for drone platforms and how to process data collected during a mission. Students will examine FLIR data and process collected data using Datumate® software.

BIOLOGY

Biology Placement Guidelines and Course Equivalences — One year of high school biology with a “C” or higher grade within the last five years is equal to BIO 114 Introduction to Biology. Advanced Placement (AP): test score of 3 = BIO 114 Introduction to Biology; test score of 4 or 5 (see biology faculty for placement).

BIO 110 ESSENTIALS OF ANATOMY AND PHYSIOLOGY 4(3-2)
Normally Offered: F, SP

This course addresses the principles of human anatomy and physiology as related to medical assisting. It incorporates three unifying themes: the relationship between physiology and anatomy, the interrelations among the organ systems, and the relationship of each organ system to homeostasis.

Prerequisite: High school biology or equivalent.

BIO 114 INTRODUCTION TO BIOLOGICAL SCIENCE.....4(3-2)

Normally Offered: F, SP, SU

A basic course on the principles of biology, including a survey of life forms on planet Earth and coverage on classification, basic cytology, plant and animal forms, and physiology, classical and molecular genetics, paleontology, evolution, ecology, and life zones.

Prerequisite: Enrollment in ENG 102 or eligibility placement in ENG 111 or higher.

BIO 129 INTRODUCTION TO FIELD BIOLOGY3(2-2)

Normally Offered: F, SU

Gives the beginning student an introduction to the disciplines of field study and natural history in biology. Course emphasis will be on learning to recognize common plants and animals of Eastern United States and knowledge of the habitats where one would expect to find these organisms. Numerous field trips will be taken and a portion of the instruction time will be spent outdoors.

BIO 140 MICROBIOLOGY FOR THE HEALTH SCIENCES.....3(3-2)

Normally Offered: F, SP

This course is targeted for students pursuing associate degree level programs in the allied health sciences. Emphasis will be placed on the microorganisms that cause disease. Content includes the diagnosis and pathogenesis of infectious diseases, host defense mechanisms, epidemiology, public health, healthcare-associated infections, and infection control. Students majoring/minoring in biology or other pre-professional programs are advised to take BIO 227.

Prerequisite: BIO 110 or BIO 114 or equivalent; CEM 100 or CEM 111 or equivalent recommended.

BIO 161 GENERAL COLLEGE BIOLOGY I.....4(3-2)

Normally Offered: F

First installment of a year-long introductory course in biology for science majors. Topics include macromolecules, energy metabolism, cytology cellular reproduction, genetics, evolution, phylogeny, viruses, bacteria and protists.

Prerequisite: BIO 114 or equivalent; eligibility placement in ENG 111 and CEM 111 or CEM 100 (as a co-requisite).

BIOLOGY

BIO 162 GENERAL COLLEGE BIOLOGY II.....4(3-2)

Normally Offered: SP

Second semester of a year-long introductory course in biology for science majors. Topics include biological diversity and evolution of plants, fungi, and animals; form and function of plants and animals; development; ecology and behavior.

Prerequisite: BIO 114, or BIO 161, or equivalent; eligibility for placement in ENG 111.

BIO 200 ANATOMY & PHYSIOLOGY FOR ALLIED HEALTH.....6(4.5-3)

Normally Offered: SU (odd years)

This course is designed for students in allied health programs. It is an intensive lecture/laboratory course emphasizing the basic concepts and principles of human anatomy and physiology.

Prerequisite: BIO 110 or BIO 114 and CEM 100 or equivalent or permission of instructor.

BIO 201 HUMAN ANATOMY.....4(3-2)

Normally Offered: F, SP

This course is a comprehensive study of the microscopic and macroscopic structure of all the human body systems. In lecture, gross anatomy is incorporated with functional anatomy and clinically-related topics. Laboratory work includes the study of slides, human skeletons, anatomical models, and a prosected cadaver. Some animal organs are dissected and compared with those of humans.

Prerequisite: BIO 110 or BIO 114 or BIO 161.

BIO 203 HUMAN PHYSIOLOGY.....4(3-2)

Normally Offered: F, SP

Covers for the most part the normal functions of the human body. Topics that are stressed include cell physiology, movement, circulation, respiration, regulation of water and electrolyte balance, digestion and absorption of food, endocrinology, reproduction, and sensory processing. The lab considers clinical applications of physiology.

Prerequisite: BIO 201 and CEM 111 or equivalent.

BIO 207 WILDLIFE & FISHERIES ECOLOGY & MANAGEMENT3(3-0)

Normally Offered: SP

This course will give an overview of the management and conservation of natural resources. The topics will include careers and professional development; ecology; population dynamics and genetics; management of natural resources; legislation of natural resources; and human interactions and attitudes.

Prerequisite: MTH 102; high school biology or equivalent.

BIO 210 INTRODUCTION TO BOTANY4(3-3)

Normally Offered: F

A basic survey course covering the major divisions of plants from algae through the flowering plants. Two weeks are spent on local flora, as well as traditional aspects of plant anatomy, physiology, paleontology, genetics, and ecology.

Prerequisite: BIO 114 or equivalent.

BIO 211 GENERAL ZOOLOGY.....4(3-2)

Normally Offered: SP

A survey course on the major phyla of animals. Includes evolutionary relationships, structure, function, behavior, adaptations, and economic importance of major groups of phyla of animals.

Prerequisite: BIO 114 with a 2.0 or better or equivalent.

BIO 215 FIELD BOTANY3(2-2)

Normally Offered: SU

This course will introduce students to the principles and rationale of classification, life histories, morphology and environmental relationships of plants. Emphasis will be placed on plant taxa of Michigan and the Great Lakes region. Students will be able to recognize common families, genera and species.

Prerequisite: BIO 114.

BIOLOGY

BIO 217 CELL BIOLOGY3(3-0)

Normally Offered: On Demand

A basic course in cytology. Approximately one-half of the course deals with cells of higher organisms, their numerous included organelles, and how cells organize and function as tissues. One-half of the course will deal with cellular physiology, cellular genetics, the cytology of abnormal cells such as cancer, cytology and medical applications and pathology. Recommended for biology majors.

Prerequisite: BIO 161.

BIO 227 MICROBIOLOGY4(3-3)

Normally Offered: F, SP

Involves identification, anatomy, physiology and genetics of microorganisms. Special emphasis is given to infectious diseases and the organisms that cause these diseases.

Prerequisite: BIO 161 or the following combinations: BIO 110 or BIO 114 and CEM 111.

BIO 228 PATHOPHYSIOLOGY4(4-0)

Normally Offered: F

Mechanisms of disease will be examined at the cellular, organ, and organ system levels as background for understanding clinical interventions. Alterations in structure and function will be correlated with adaptive responses. Capacity to cope with disease will be presented as a product of factors including heredity, age, and lifestyle.

Prerequisite: BIO 201 and BIO 203 with a 2.0 grade or higher.

BUSINESS ADMINISTRATION

BUS 115 FOUNDATIONS IN PERSONAL FINANCES (MASTERING THE BASICS) 1(1-0)

Normally Offered: F, SP

The Foundations in Personal Finance (Mastering the Basics) course provides students with strategies for managing money. The financial strategies are divided into five areas of study including savings, budget, debt, college student essentials, and philanthropy. This course will challenge the way students view money and empower them to graduate on a solid financial foundation.

BUS 116 FOUNDATIONS IN PERSONAL FINANCES (DEVELOPING YOUR SKILLS) 1(1-0)

Normally Offered: F, SP

The Foundations in Personal Finance (Developing Your Skills) course will assist students in becoming educated consumers. It will show students how companies compete for their money, identify financing strategies that encourage college students to go into debt, teach five basic rules for making large purchases, summarize the three keys to getting bargains, and describe the seven basic rules of negotiating and summarizing laws that protect consumers from illegal collection practices. Students will learn actions to take when their identity has been compromised and how to communicate effectively with credit bureaus and other agencies about collections issues.

BUS 117 FOUNDATIONS IN PERSONAL FINANCES (CONSIDERING THE FUTURE)..... 1(1-0)

Normally Offered: F, SP

The Foundations in Personal Finance (Considering the Future) explores the three basic principles of financial planning for the future, including investments, retirement and savings plans, and real estate. Students will examine the relationship between diversification and risk, and compare and contrast different types of investments. Various retirement account tax treatments will be classified and summarized. Students will learn why a home is a great investment, how to determine what to look for when purchasing a home, and how to maximize the sale of a home. Students will compare and contrast the various types of home mortgages and identify the pros and cons of renting versus owning a home.

BUSINESS ADMINISTRATION

BUS 121 INTRODUCTION TO BUSINESS.....3(3-0)

Normally Offered: F, SP, SU

This course examines an overall view of today's business world. Topics discussed include the American economic system, the organization and management of businesses, financing, marketing, international trade, human resources management, and other business-related topics.

BUS 122 PERSONAL SELLING.....3(3-0)

Normally Offered: F

This course covers selling, covering the selling process, buy motivation, careers in selling, and ethical problems in selling. Both oral and written presentations are used. Use is made of video technology in oral presentations. Sales demonstrations in class are evaluated by both the students in the class and the instructor.

BUS 123 PRINCIPLES OF ACCOUNTING I.....4(4-0)

Normally Offered: F

Stresses the basic concept of accounting and financial reporting. The accounting cycle is presented, followed by discussion of current assets and liabilities, fixed assets and related depreciation methods, and systems of internal control and electronic data processing. Practice in accounting skill is obtained through the recording of transactions and preparation of financial statements.

Co-requisite: BUS 125 or MTH 102 or MTH 113 or MTH 121 or MTH 122 or MTH 123 or MTH 130 or MTH 131 or MTH 132 or MTH 223 or MTH 231 or MTH 232.

BUS 124 PRINCIPLES OF ACCOUNTING II.....4(4-0)

Normally Offered: SP

Continues the coverage of financial accounting from BUS 123, including corporations, stock issuance, long term assets and liabilities, investments, cash flows, and financial statement analysis. Provides the fundamentals of managerial accounting.

Prerequisite: BUS 123.

BUS 125 BUSINESS MATHEMATICS.....3(3-0)

Normally Offered: F

This course applies fundamental arithmetic processes to the solution of problems arising in a business office. It includes material covering fractions, decimals, percentages, trade and cash discounts, markup and markdown, payroll, simple and compound interest, annuities, present and future value, sinking funds, consumer and business credit, mortgage amortization, and depreciation.

Prerequisite: MTH 090 or satisfactory math placement score.

BUS 127 PRINCIPLES OF MANAGEMENT3(3-0)

Normally Offered: F, SP

This course studies the basic concepts and considerations affecting the scope of management. Emphasis is upon the planning, organizing, actuating, and controlling functions of management. Case studies are used to delineate the problems of all units of management.

BUS 128 SMALL BUSINESS MANAGEMENT3(3-0)

Normally Offered: F

Examines the significant problems encountered by those who wish to manage their own small business. Solutions are offered to general, financial and personnel management problems, capital needs and sources, advertising and markets, credit and inventory contracts, pricing and accounting problems.

BUS 221 BUSINESS LAW I.....3(3-0)

Normally Offered: F

Introduces the student to the basic principles of law that are applicable to business. The law is studied in the following areas: legal and constitutional foundations, court system, ethics, torts, contracts and UCC sales, personal property and bailments, and real property and landlord-tenant.

BUSINESS ADMINISTRATION

BUS 222 BUSINESS LAW II.....3(3-0)

Normally Offered: SP

Studies the law relating to intellectual property, business crimes, negotiable instruments, banking, creditor rights and bankruptcy, business organizations, employment, agency, and antitrust.

BUS 223 INTERMEDIATE ACCOUNTING I4(4-0)

Normally Offered: F

This course covers principles applicable to the corporate balance sheet and income statement following a review of accounting procedures developed in Accounting Principles. Accounting for assets, liabilities and stockholders' equity of corporations, as well as income statement reporting will be covered. Financial statement presentation and disclosures will be emphasized, taking into account international financial accounting standards.

Prerequisite: BUS 124 with 2.0 or higher

BUS 224 INTERMEDIATE ACCOUNTING II4(4-0)

Normally Offered: SP

This course continues the study of valuation principles applicable to the liability and equity sections of the balance sheet. Interpretation of financial statements is emphasized. A Statement of Cash Flows will be prepared. Procedures for correcting prior years' statements are evaluated and the problems of income tax allocation are studied. Students are encouraged to develop a philosophy of accounting which includes global accounting standards.

Prerequisite: BUS 223 with 2.0 or higher.

BUS 225 TAX OF INDIVIDUALS.....3(3-0)

Normally Offered: F

This course covers the principles of federal taxation relative to individuals and sole proprietorships. A focus on tax research is emphasized in response to ongoing revisions in federal tax laws. Concepts covered include the purpose of taxes and the impact of federal tax laws on society; reporting requirements, tax compliance, the IRS, and tax authorities; tax planning strategies and related limitations; gross income and exclusions; deductions for AGI and from AGI; tax computation and tax credits; the alternative minimum tax for individuals; investments, compensation, retirement savings and deferred compensation; and home ownership. Additionally, concepts are covered related to sole proprietorships, including business income, deductions, and accounting methods; and property acquisition, cost recovery, and property dispositions.

Prerequisite: BUS 123 or consent of instructor.

BUS 226 TAXATION OF BUSINESS ENTITIES.....3(3-0)

Normally Offered: SP

This course covers the principles of federal taxation relative to business entities, including corporations, S corporations, limited liability companies (LLC), limited partnerships, and general partnerships. Also addressed are business tax concepts related to the sole proprietorship business entity, although this entity type is covered extensively in BUS 225. A focus on tax research is emphasized in response to ongoing revisions in federal tax laws. Concepts covered include reporting requirements, tax compliance, tax planning strategies and related limitations; accounting methods, gross income and exclusions; business deductions; tax computation and tax credits, and the alternative minimum tax. Also covered are concepts related to property acquisition, cost recovery, and property dispositions. An overview of state and local taxes and multinational transactions related to business transactions is also included.

Prerequisite: BUS 123 and BUS 225 or consent of instructor.

BUS 228 COST ACCOUNTING3(3-0)

Normally Offered: F

Presents methods of determining materials, labor and manufacturing costs used to value inventory and to determine net income. Job order, process, and standard cost systems will be reviewed. Budgets and the relevance of costs to managers' decisions will be discussed.

Prerequisite: BUS 124 or consent of instructor.

BUSINESS ADMINISTRATION

BUS 229 ADVERTISING.....3(3-0)

Normally Offered: SP

This course covers the basic principles and practices of advertising including media, advertisement creation, copy and layout design, advertising planning and management, and the integration of advertising and the marketing system.

BUS 233 MANAGEMENT AND SUPERVISORY LEADERSHIP3(3-0)

Normally Offered: SU

This course presents the modern supervisory job in its proper perspective. Topics covered include most effective supervisory approaches; the role of the supervisor in the organization; the basis for good motivation, group member and team development, and sound team effort. The supervisor is discussed in relation to the total managerial environment, to self-management, and to the individual employee in the work group.

BUS 235 HUMAN RESOURCES MANAGEMENT3(3-0)

Normally Offered: SP

This course provides the foundation for contemporary theory and practices relating to the management of human resources activities. Attention is devoted to the personnel processes that are involved in the procurement, development, and maintenance of human resources. Emphasis is placed on the role of the departmental supervisor, manager, and their superiors in the management of subordinate personnel.

BUS 241 PRINCIPLES OF MARKETING.....3(3-0)

Normally Offered: SP

This course covers the marketing aspects of the firm including classification of goods, retailing, wholesaling, physical distribution, personal selling, advertising, pricing, market forecasting and research, and the economic/legal environment in which the business enterprise functions.

BUS 248 BUSINESS COMMUNICATIONS3(3-0)

Normally Offered: SP

This course is designed to improve upon all forms of business communications. This course focuses on developing the ability to compose effective business letters, memoranda, reports, and resumes. The principles of written and oral communication and the underlying psychology are studied. Additional topics include intercultural communication, non-verbal communication, how technology in changing communication, job applications, integrity and ethics, and legal aspects of communication. Students are required to write many business letters. Research will be conducted for the business report and a summary of the report will be presented in class using presentation software.

Prerequisite: Ability to keyboard or permission of instructor plus successful completion of ENG 102 or placement in ENG 111 or 121.

BUS 255 BUSINESS APPLICATION SOFTWARE3(2-2)

Normally Offered: SP

A continuation of CIS 120, this second course teaches advanced skills using word processing, spreadsheet, database, and multimedia presentation software. Students will manage multiple worksheets and work with complex spreadsheet functions, as well as PivotTables and PivotCharts. Templates, styles, mail merge, advanced formatting of objects, and innovative

presentation animations will be taught. Students will learn how to create advanced database queries and custom database reports. Solutions to business problems will be developed, integrating data between applications.

Prerequisite: CIS 120 or permission of instructor.

BUS 257 COMPUTERIZED ACCOUNTING SYSTEMS 1.5(2-0)

Normally Offered: SP

Utilizes commercially available software for the small business accounting functions of accounts receivable, accounts payable, payroll, general ledger, inventory, accounting cycle completion, and financial statement reporting.

Prerequisite: BUS 123 and CIS 120, or instructor permission.

BUSINESS ADMINISTRATION

BUS 262 PROJECT MANAGEMENT 3(2-2)

Normally Offered: F

Students will be presented a number of techniques and tools used in guiding a project from concept through lifecycle completion. Topics include defining a project scope, the project charter, work breakdown structure, creating a budget, defining objectives, evaluation, risk management, understanding triple constraints, and the usage of project management software. Instruction will include standards from ANSI, ISO, and the Project Management Institute (PMI).

Prerequisite or Co-requisite: ENG 111 or ENG 121, and CIS 120, or instructor permission.

BUS 390 UTILITY FINANCING & ACCOUNTING..... 3(3-0)

Normally Offered: F

This course introduces students to electric utility company financing and accounting. The unique characteristics of these regulated utilities, resulting from federal and state agency requirements, will be explored using the perspectives of the three types of utility company ownership, including investor-owned; cooperatives; and municipalities. Revenue rate-setting policies, operations and capital budgets, annual financial statements, and other financial and accounting aspects of electric utilities will be analyzed and evaluated. This course is designed to equip entry-level and middle managers in the electric utility profession with knowledge and skills to relate utility financing and accounting fundamentals to their job responsibilities.

Prerequisite: MTH 113 or higher.

BUS 391 UTILITY REGULATIONS 3(3-0)

Normally Offered: S

This course focuses on public service commissions and the role of government in the modern utility, Federal Energy Regulatory Commission (FERC) and North American Electric Reliability Corporation (NERC) operations and how they affect the utilities and governing bodies for different types of utilities.

Prerequisite: ENG 111 or ENG 120.

BUSINESS INFORMATION SYSTEMS

BIS 100 COMPUTER KEYBOARDING 1(0-2)

Normally Offered: F, SP

This course teaches the student how to touch type (use the correct fingers on the correct keys without looking at the keyboard). Emphasis is on using proper techniques to touch type the alpha, numeric, and symbol keys. Students will also learn how to efficiently use the special keys found on a computer keyboard and how to touch type the numeric keypad.

BIS 101 KEYBOARD SKILLBUILDING 1(0-2)

Normally Offered: F, SP, SU

Allows students to develop keyboarding skills to levels desired by the individual student. Emphasis is on learning correct techniques and improving accuracy by identifying error patterns, with a resulting improvement in speed.

Prerequisite: BIS 100 with a grade of 2.0 or higher, or correct operation of all keys by touch and the ability to type 30 words per minute on a three-minute timed typing with three errors or less, or permission of instructor.

BIS 140 PROOFREADING & EDITING FOR BUSINESS PROFESSIONALS3(2-2)
Normally Offered: SP

Teaches students to apply the principles of English grammar, style, and usage to business correspondence. Topics include capitalization, numbers, abbreviations, word division, forms of address, and proofreading, particularly as applied to electronic documents.

Prerequisite: ENG 111 or qualifying placement score.

BUSINESS INFORMATION SYSTEMS

BIS 159 MEDICAL OFFICE ADMINISTRATIVE SEMINAR3(3-0)
Normally Offered: F

Covers the skills and knowledge necessary for entry-level medical office administrative work. Topics covered are time management, organization, team work, and problem solving as relates to clinic workflow and the revenue cycle. Patient advocacy, community resources, medical reports, HIPAA, billing, coding, telephone techniques, appointment scheduling, communication with patients, and other medical office topics are presented.

BIS 160 MEDICAL TERMINOLOGY4(4-0)
Normally Offered: F, SP, SU

Presents the fundamentals of medical language for all allied health professionals and interested lay people. Includes definitions, pronunciations, spellings, and abbreviations of anatomical, symptomatic, diagnostic and operative terms pertaining to each anatomical system of the body. Lecture, discussion and workbook exercises bring the language alive by making the study interesting and logical.

BIS 167 MEDICAL ETHICS & LAW FOR HEALTH PROFESSIONALS3(3-0)
Normally Offered: SP

Introduces allied health professionals to common, everyday medical law and medical ethical issues in the health professions. The student will learn to distinguish between morality and ethical issues and the reasoning of their importance. Through discussion the student will employ background information and case-driven approaches to the prototypes of ethical theories and problems. Major attention is devoted to basic personnel processes that include the proclamation, development, and maintenance of working ethically within different departments and organizations of Health Care.

BIS 169 PRACTICE MANAGEMENT SOFTWARE3(2-2)
Normally Offered: SP

This course teaches students the basics of administrative and clinical functions in the physician's office and outpatient settings. Topics include appointment scheduling, patient registration, posting charges and payments, entering insurance information for claim forms, producing financial reports, patient problems and medication lists, e-prescriptions, creating exam notes, and cataloging lab and procedure results.

Prerequisite: BIS 100 or touch typing ability.

BIS 220 MEDICAL OFFICE ADMINISTRATIVE PRACTICUM.....3(1-2)
Normally Offered: SUM

Provides an 80-hour practical education/work experience in a physician's office or health care facility. The student is supervised and evaluated by qualified and licensed medical personnel. The student will have experiences in applying knowledge in performing administrative procedures including reception responsibilities, coding, insurance billing, release of information, and other related administrative medical office tasks. Development of a professional attitude through interaction with other professionals and consumers in the health care field is expected.

Prerequisite: BIO 110, BIS 159, BIS 160, BIS 167, BIS 169, CIS 120, PEH 264 all with a grade of 2.0 or higher; English and Psychology requirements; CPR Certification, and complete physical examination.

CADD TECHNOLOGY

CAD 132 AUTOCAD FUNDAMENTALS 1.5(1-1)

Normally Offered: SP

Introduces principles of CAD in an AutoCAD software environment, providing the student with fundamental knowledge of CAD system components and how to utilize AutoCAD software in the creation of technical drawings.

Prerequisite: Basic computer proficiency recommended or permission of instructor.

CADD TECHNOLOGY

CAD 135 INTERMEDIATE AUTOCAD 1.5(1-1)

Normally Offered: SP

Continues utilization of CAD technology in an AutoCAD software environment for both mechanical and architectural applications. Previously learned principles are reviewed and their use expanded. More advanced concepts and methods are introduced.

Prerequisite: CAD 132.

CAD 150 3D MODELING..... 3(2-2)

Normally Offered: SP

This course introduces 3D parametric modeling and design techniques. Students will learn skills needed to create parametric models and designs of basic to moderately complex parts and assemblies. Students will learn how to then generate technical drawings from these models.

Prerequisite: Basic computer proficiency recommended or permission of instructor.

CAD 220 MACHINE DESIGN 3(2-2)

Normally Offered: F

This course acquaints the student with advanced mechanical drawings and machine design problems. Topics covered include assembly and detail drawings, revisions, fits, finishes, geometric dimensioning and tolerancing, fasteners, bearings, and manufacturability. Calculations made in sizing components with emphasis on commercially available elements.

Prerequisite: CAD 150, MTH 110, and MFG 101.

CAD 250 ADVANCED 3D MODELING..... 3(2-2)

Normally Offered: SP

This course enhances students' knowledge of parametric design with advanced 3D modeling techniques and design intent. Emphasis is placed on design intent while learning advanced skills such as: top down assembly modeling, configurations, design tables, weldments, advanced shapes, model analysis, advanced templates, and an overview of different 3D modeling software in the market place.

Prerequisite: CAD 150.

CHEMISTRY

Chemistry Placement Guidelines and Course Equivalencies — One year of high school chemistry with a “C” or higher grade within the last five years is equal to CEM 100 Introductory Chemistry. Two years of high school chemistry with a “C” or higher grade within the last five years is equal to CEM 111 General Chemistry. Advanced Placement (AP): test score of 3 = CEM 121 General and Inorganic Chemistry; test score of 4 = CEM 121 General and Inorganic Chemistry and CEM 122 Inorganic Chemistry & Qualitative Analysis.

CEM 100 INTRODUCTORY CHEMISTRY5(4-3)

Normally Offered: F, SP, SU

Surveys inorganic chemistry, providing an introductory chemical background for students who do not have experience in chemistry. Course involves a parallel laboratory experience, as well as basic mathematical concepts necessary for Chemistry 111 or 121.

Prerequisite: MTH 102 with a grade of 2.0 or higher or consent of instructor

CEM 111 GENERAL CHEMISTRY4(4-3)

Normally Offered: F, SP, SU

Introduces the study of atomic structure, periodic systems, chemical bonds, stoichiometry, gas laws, liquids and solids, solutions, etc. Theory is illustrated and applied through selected laboratory experiences. Prepares chemistry majors having limited backgrounds in high school chemistry for CEM 121 and non-majors for CEM 112.

Prerequisite: One unit of high school algebra or consent of instructor.

CHEMISTRY

CEM 112 ORGANIC & BIOCHEMISTRY4(4-3)

Normally Offered: SP

A continuation of CEM 111 with emphasis on organic and biochemistry. This is a survey course covering organic structure, synthesis, reactions, mechanism, and nomenclature. The biochemistry of proteins, carbohydrates, lipids, cells, genetics, etc. are covered. Laboratory experiments in biochemical and organic identification, synthesis, separation and purification with use of instrumentation are emphasized. Fulfills the basic science requirement for non-science majors and several health science categories.

Prerequisite: CEM 111 or 121 or its equivalent and one year of algebra or consent of instructor.

CEM 121 GENERAL & INORGANIC CHEMISTRY4(4-3)

Normally Offered: F

Includes atomic structure, periodic systems, bonding, descriptive chemistry, stoichiometry, gas laws, liquids and solids, solutions, etc. Theory is illustrated and applied through selected laboratory experiences. Designed as basic course for students on scientific programs dealing with fundamental chemical principles.

Prerequisite: One unit of high school algebra, geometry and chemistry.

CEM 122 INORGANIC CHEMISTRY & QUALITATIVE ANALYSIS4(4-3)

Normally Offered: SP

Continues CEM 121, with emphasis on the study of chemical kinetics, equilibrium, electrochemistry, chemical thermodynamics, and organic chemistry. The principles of ionic equilibria and reaction mechanisms are applied in laboratory study of chemical measurements and the separation and identification of common cations and anions.

Prerequisite: CEM 121 or consent of instructor.

CEM 221 ORGANIC CHEMISTRY.....5(4-3)

Normally Offered: F

Emphasizes fundamental principles of organic chemistry in the study of aliphatic and aromatic compounds. Laboratory work is selected to provide experience with common apparatus and techniques and illustrate preparations and reactions discussed in class.

Prerequisite: CEM 122 or equivalent.

CEM 222 ORGANIC CHEMISTRY.....5(4-3)**Normally Offered: SP**

Continues CEM 221. The functional group compounds are studied in the areas of structure, organic synthesis and reaction mechanisms. Laboratory work includes organic qualitative analysis.

Prerequisite: CEM 221 or equivalent.

COLLEGE SUCCESS SKILLS**CSS 095 EFFECTIVE READING STRATEGIES & STUDY SKILLS3(2-2)****Normally Offered: F, SP**

This course focuses on group work in improving reading (comprehension and vocabulary), writing, and study skills (test-taking, time management, memory, concentration, etc.) with emphasis on finding the main idea, evaluating, and reading. The lab component focuses on the needs of each student based on an individual, test-indicated basis.

CSS 098 COLLEGE COMPREHENSION STRATEGIES & STUDY SKILLS3(2-2)**Normally Offered: F, SP**

This course is designed to promote an understanding of how knowledge is acquired, how to strengthen those reading skills already possessed, develop new techniques for efficient study, and provide opportunities to practice those strategies in a variety of content areas. College Comprehension and Study Skills focuses on group-work and improving comprehension, vocabulary, rate, writing and study skills, lecture/reading note-taking, listening, memory, concentration, etc., with emphasis on applying learned strategies to the content areas. The lab component focuses on the needs and strengths of each individual student through test-indicated basis.

COLLEGE SUCCESS SKILLS**CSS 100 BECOMING A MASTER STUDENT2(2-0)****Normally Offered: F, SP**

A student success course covering academic skills, life management skills, and an introduction to resources of the school and community.

CSS 120 FIRST YEAR STUDENT SEMINAR1(1-0)**Normally Offered: F, SP**

A gateway or foundational course that introduces new students to the meaning, purpose, and value of post-secondary education and the college curriculum. This course will also address non-cognitive issues and the challenges they present to successful completion of a college degree and focuses on the development of skills, strategies, habits, and attitudes to deal with life issues.

COMPUTER INFORMATION SYSTEMS**CIS 120 INTRODUCTION TO MICROCOMPUTERS3(2-2)****Normally Offered: F, SP, SUM**

Introduces the student to operating system and software applications of word processing, spreadsheets, databases, and multimedia presentations. Covers file management; using Help and Support; creating and editing flyers, letters, research papers, and resumes; creating spreadsheets and charts; using formulas and functions; performing what-if analysis; creating,

maintaining, and querying a database; and creating and editing a presentation using illustrations, shapes, and transitions.

CIS 140 INTRODUCTION TO MICROSOFT CLIENT OS3(2-2)

Normally Offered: F

Using both a “hands-on” and theoretical approach, this course teaches students to manage system resources through the Microsoft client operating system (OS) environment. In addition to basic system commands, students will learn how to install and customize the operating system environment for deployment in an office or networked environment.

CIS 151* WORD PROCESSING I: BEGINNING 1(.75-.5)

Normally Offered: F

This course presents fundamental word processing skill development in the areas of creating, editing, and formatting documents used personally and in business including memos, letters, reports, newsletters, and templates. Students who cannot touch type 30 words per minute are encouraged to take BIS 100 Computer Keyboarding before this course.

CIS 152* WORD PROCESSING II: FORMATTING DOCUMENTS..... 1(.75-.5)

Normally Offered: F

This course presents extensive formatting skill development in documents using tables, graphics, themes, and report features.

Prerequisite: CIS 151 or proficiency exam.

CIS 153* WORD PROCESSING III: SPECIAL FEATURES..... 1(.75-.5)

Normally Offered: F

This course presents features of word processing skill development in the areas of using styles, footnotes, citations, sources, captions, bibliographies, equations, screenshots, graphic layering, watermarks, page borders, and numerous collaboration features for working with documents in digital form worldwide.

Prerequisite: CIS 152 or proficiency exam.

* Course sequence CIS 151, 152 & 153 prepares students for the Microsoft Office Specialist (MOS) Word Certification Exam.

COMPUTER INFORMATION SYSTEMS

CIS 171* SPREADSHEETS I: BEGINNING WORKSHEETS & FORMULAS 1(.75-.5)

Normally Offered: SP

This course teaches the essential aspects of a spreadsheet software program. Students will learn extensive formatting skills, study formulas and functions, and use the spreadsheet for completing calculations, projecting results of business decisions, and producing charts.

CIS 172* SPREADSHEETS II: GRAPHS & CHARTS 1(.75-.5)

Normally Offered: SP

This course continues the teaching of the aspects of a spreadsheet software program. Students will learn how to develop advanced formulas, use conditional functions to summarize data, do advanced charting, manage multiple worksheets and workbooks, integrate spreadsheets with other programs, and develop spreadsheet applications with macros.

Prerequisite: CIS 171 or proficiency exam.

CIS 173* SPREADSHEETS III: DATA BASE APPLICATIONS..... 1(.75-.5)

Normally Offered: SP

This course continues the teaching of the aspects of a spreadsheet software program. Students will explore financial tools and functions, use data tables, and work with scenario manager and solver. Relational databases will be used to transform data with PowerPivot® and advanced queries and filters. Collaboration tools will be featured, including comparing, merging, and sharing workbooks, tracking changes and comments, object linking and embedding, and developing a workbook for international clients.

Prerequisite: CIS 172 or proficiency exam.

* Course sequence CIS 171, 172 & 173 prepares students for the Microsoft Office Specialist (MOS) Excel and Excel Expert Certification Exams.

CIS 206 OBJECT ORIENTED PROGRAMMING..... 3(2-2)

Normally Offered: F

Students will develop a basic understanding of arrays, pointers, structures, and object oriented programming. The goal of the course is to provide students with the knowledge and skills they need to develop object oriented applications (including mobile applications) using best programming practices. The course focuses on program structure, language syntax and implementation details.

Prerequisite: CIS 120 or instructor permission.

CIS 240* MULTIMEDIA PRESENTATIONS..... 3(2-2)

Normally Offered: SP

Covers the fundamentals of modern usage of multimedia in presentations. Design techniques will be taught, along with using clip art, graphics and audio visual files to enhance presentations. Using computer software designed for this purpose, students produce overheads, interactive slide shows, handouts and speaker notes. Skills learned are demonstrated by doing a multimedia project.

* Course prepares students for the Microsoft Office Specialist (MOS) exam to become certified at the core level using PowerPoint.

Reading Level Recommendation: College Level

CIS 241* INTRODUCTION TO WEB DESIGN & MANAGEMENT 3(2-2)

Normally Offered: SP

This course teaches students how to design, create, implement, and maintain a web site. Web page design principles are covered along with using hypertext markup and web-authoring software to create and manage web pages/sites. Students learn integration techniques for web-based databases, how to use multimedia in a web site, how to create and enhance images for web sites, and how to ensure security for a private Intranet for a target audience.

COMPUTER INFORMATION SYSTEMS

CIS 250 DESKTOP PUBLISHING..... 3(2-2)

Normally Offered: F

This course introduces the principles, equipment, and skills used in the publishing process using desktop publishing software. Students will create and modify a wide range of publications, using judgment related to fonts, spacing, text, layouts, colors, graphics, and media.

CIS 258 INTRODUCTION TO ENTERPRISE DATABASE 3(2-2)

Normally Offered: SP

Students will learn about the history of SQL, database options deployed in the marketplace today, and will be introduced to the fundamentals of enterprise database technology. Topics covered include database concepts, database design theory, entity-relationship models, SQL language, security, and database security and maintenance.

CIS 270 NETWORK ADMINISTRATION 3(2-2)

Normally Offered: F

This course covers Local Area Network (LAN) administration and uses after the network hardware and network operating systems have been installed. Students working in small teams will administer an operating LAN.

Prerequisite: CIS 160 or permission of instructor.

CIS 280 NETWORK THEORY DESIGN & INSTALLATION 4(2-4)

Normally Offered: SP

This course covers Local Area Network (LAN) fundamentals and terminology. Students will install and configure a LAN. Topics covered include: selection of LAN interface cards, cable, wiring plans, server hardware and operating system software, LAN maintenance, integrating LANs into existing networks and isolating LAN software and hardware problems. Labs should cause all elements to come to life through the many real-world exercises provided during the course of instruction. Most important, though, is the emphasis on gaining skills to start anyone who desires a career in network administration on the road to success.

Prerequisite: CIS 270.

CIS 281 ADVANCED WORD PROCESSING I: DESIGNING WITH GRAPHICS & LAYOUTS 1(.75-.5)

Normally Offered: SP

This course presents advanced information processing skill development in the areas of graphics, lines, charts and layouts, and document designs, especially when used in columns, tables, and reports.

Prerequisite: CIS 153 or proficiency exam.

CIS 282 ADVANCED WORD PROCESSING II: PRODUCING LONG DOCUMENTS 1(.75-.5)

Normally Offered: SP

This course presents advanced information processing skill development in the area of long documents that include using outlines, master and subdocuments, title page, table of contents, table of illustrations, charts, indexes, footnotes/endnotes, and citations. Students also learn to create electronic forms.

Prerequisite: CIS 281 or proficiency exam.

CIS 283 ADVANCED WORD PROCESSING III: MACROS & MERGES 1(.75-.5)

Normally Offered: SP

This course presents advanced information processing skill development in the areas of macros creation, editing and use, as well as merging documents, including letters, labels and templates.

Prerequisite: CIS 282 or proficiency exam.

*Course sequence CIS 281, CIS 282, CIS 283 prepares students for the Microsoft Office Specialist (MOS) Word Expert Certification Exam.

COMPUTER INFORMATION SYSTEMS

CIS 295 IT PROFESSIONAL PRACTICE MANAGEMENT 3(2-2)

Normally Offered: SP

Students will learn about the ever-changing industry of Information Technology and its impact on and alignment with business objectives. Using concepts from prior classes, students will explore the design and setup of IT departments and procedures in both small and large organizations. Through case studies, scenarios, and role playing, students will have the opportunity to manage a team of IT professionals.

Prerequisite: Minimum of 18 credits in CIS or CNS coursework or instructor permission.

COMPUTER NETWORK SYSTEMS

CNS 150 NETWORKING FUNDAMENTALS3(2-2)

Normally Offered: F

This course will introduce hardware and software technologies utilized to build computer networks and communicate data among devices. Students will build a working Local Area Network (LAN) utilizing multiple protocols and operating systems.

Co-requisite: CIS 140 and CNS 151 or instructor permission.

CNS 151 NETWORK COMMUNICATION CABLING3(2-2)

Normally Offered: F

This course is designed to provide the learner with the knowledge to install and support the physical layer of computer and telecommunications networks. Students will learn proper installation and certification techniques based on TIA/EIA standards for copper and fiber optic cabling.

CNS 155 INTRODUCTION TO ROUTING & SWITCHING3(2-2)

Normally Offered: SP

Using a basic knowledge of computer networks, students will learn how to link multiple networks together using routing, switching, VPN or WAN technologies. Using CISCO standards, students will simulate a working Internet environment and explore a variety of techniques and routing protocols.

Prerequisite: CNS 150 or instructor permission.

CNS 170 PC REPAIR & MAINTENANCE4(3-2)

Normally Offered: F

Students will be introduced to techniques and tools utilized in repairing desktop and laptop computer systems and peripherals. In a lab environment students will practice the diagnosis, identification, and replacement of computer components using industry recognized processes and technical documentation.

CNS 180 INTRODUCTION TO MICROSOFT SERVER.....3(2-2)

Normally Offered: SP

This course will introduce students to the Microsoft Server solution. Students in a lab experience will practice the deployment and administration of a Microsoft Server utilizing Active Directory to audit and manage user and computer accounts.

Prerequisite: CIS 140 or instructor permission.

CNS 210 MICROSOFT NETWORK MANAGEMENT3(2-2)

Normally Offered: F

This course explores the networking features of a Microsoft Server solution. Students in a lab experience will practice connecting computer systems to the Internet and to other networks. Remote access technologies will also be reviewed in depth. Students will understand how to monitor network health and maintain a more secure network.

Prerequisite: CNS 180 and CNS 150 or instructor permission.

COMPUTER NETWORK SYSTEMS

CNS 215 INTRODUCTION TO VIRTUALIZATION3(2-2)

Normally Offered: SP

Students will develop a working understanding of virtualization technologies and current virtualization software packages. The goal of the course is to provide students with the knowledge and skills necessary to develop and manage virtual operating systems and virtual networks in a business/cloud setting.

Prerequisite: CNS 150 and CNS 180.

CNS 220 ADVANCED MICROSOFT SERVER 3(2-2)

Normally Offered: SP

This course focuses on the different application tools available in a Microsoft Server and how they are used to help manage, share, and secure network resources. Specifically, students will learn about virtualization technologies, software deployment tools, Terminal Services, and deploying web sites through IIS and SharePoint.

Prerequisite: CNS 180 or instructor permission.

CNS 230 INFORMATION SECURITY 3(2-2)

Normally Offered: F

This course will introduce techniques to reduce or mitigate risks to information technology assets. Specifically, desktop, network, and server applications will be discussed. A variety of case studies, ethical considerations, and penetration tools will be explored.

Co-requisite: CNS 150 or instructor permission.

CNS 235 ADVANCED INFORMATION SECURITY 3(2-2)

Normally Offered: On Demand

Students will continue exploring Information Security concepts introduced in CNS 230. This course will also review a number of new objects including physical security or equipment, secure software design, business continuity and business recovery. The materials for this course are based upon the Certified Information Systems Security Professional-Common Body of Knowledge (CISSP-CBK).

Prerequisite: CNS 230 or instructor permission.

CNS 240 OPEN SOURCE NETWORKING 3(2-2)

Normally Offered: F

Students will learn the foundational differences between open source and commercially purchased software. By utilizing LINUX in a lab setting, a comparison to and contrast with Microsoft Server products will be drawn. The class will help participants become familiar with freely available software using command line and graphical user interface options.

Prerequisite: CIS 140 or instructor permission.

CONCRETE TECHNOLOGY

CON 110 INTRODUCTION TO CONCRETE TECHNOLOGY 1(1-0)

Normally Offered: F

Introduces the various divisions of the concrete industry. Course reviews each divisions (Ready Mixed Concrete, Concrete Masonry, Prestress/Precast, Engineering, etc.), and shows the types and needs of employment in each division.

CON 121 AGGREGATES 3.5(2.1-2.8)

Normally Offered: F

Studies the entire aggregate industry. The purpose and function of fine aggregates (sand) and coarse aggregates (gravels, crushed stone, etc.) and their relationship in the construction industry are examined. Both natural and manufactured lightweight aggregates are studied. Industrial standards for testing evaluation are covered in lecture and in a hands-on laboratory.

CONCRETE TECHNOLOGY

CON 122 CONCRETE ADMIXTURES..... 1(1-0)

Normally Offered: SP

Examines the nature of concrete and how its characteristics can be altered through the use of admixtures. The effects of both chemical and mineral admixtures to Portland Cement are studied. Industrial standards for these materials will be covered.

CON 123 CEMENTITIOUS MATERIALS. 1.5(.9-1.2)

Normally Offered: F

Examines the chemical and physical components of various cementitious materials such as Portland Cement, slag cement, flyash, silica fume, etc. Also included are the production methods and standard tests of cement performance.

CON 124 CONCRETE MIX PROPORTIONING 4(2-4)

Normally Offered: SP

Covers several theories of proportioning concrete mixes, including normal weight, lightweight, high strength and others. Emphasis is given to the effect of altering mix ingredients and proportions on the properties of plastic and hardened concrete. Lab exercises intended to assist in developing a better understanding of equipment and procedures standard to the industry.

Prerequisite: CON 121 and CON 123 or permission of instructor.

CON 221 PLACED CONCRETE I..... 4(3-3)

Normally Offered: F

Studies the placed concrete industry from surveying for form layout to the final finishing of placed concrete. Mixing, placing, forming, finishing, curing and jointing are covered. Mix proportioning to solve placing problems is examined.

Prerequisite: CON 124 or permission of instructor.

CON 222 PLACED CONCRETE II..... 4(3-3)

Normally Offered: SP

Continues Placed Concrete I in studying industrial standards including ASTM and ACI using standard deviation methods. The course covers the use of fibers, pozzolans, pumping, engineering properties of placed concrete, high performance mixes, soils and roller-compacted concrete.

Prerequisite: CON 124 and CON 221.

CON 223 CONCRETE MASONRY PRODUCTION..... 4(3-3)

Normally Offered: F

Covers the manufacturing of concrete masonry products including sieve analysis, aggregate blending, mix designs and proportioning, manufacturing techniques on full scale block equipment, and curing methods. Testing methods of masonry products and architectural specifications as they pertain to the masonry producer are studied.

Prerequisite: CON 121 and CON 123 or permission of instructor.

CON 224 PRESTRESS/PRECAST CONCRETE..... 3(2-3)

Normally Offered: SP

Covers the final use of various precast concrete masonry, prestress concrete, roofing tile, pavers, pipe, panels and other precast units. Special attention is given to the layout and manufacturing of prestress units according to industrial standards, engineering properties, testing methods and product specifications.

Prerequisite: CON 223.

CONCRETE TECHNOLOGY

CON 226 CONCRETE TROUBLESHOOTING & REPAIR2(2-0)

Normally Offered: SP

Examines the basics of concrete inspection including equipment, materials and procedures. Covers the process of determining problems with concrete and deals with repair of problems. Studies the ways that problems can be reduced by using proper construction procedures.

Prerequisite: CON 221.

Co-requisite: CON 222.

CON 227 CONSTRUCTION INSPECTION2(2-0)

Normally Offered: F

Covers inspection procedures required in the construction industry with main emphasis on concrete related materials and procedures. Building codes, specifications, reporting procedures and contract requirements will be covered in detail.

Prerequisite: CON 124 or permission of instructor.

CON 231 CONCRETE PROJECT LAB1(1-0)

Normally Offered: F

Provides the opportunity for individual research and experimentation. Students are encouraged to pursue research in areas of interest that are not included in regular classes. Results of project labs are shared with other students, thereby increasing their values. The course is taken during the sophomore year with hours arranged. Each student is assigned an instructor in the field of his/her technical specialty.

Prerequisite: Sophomore standing.

CON 232 CONCRETE PROJECT LAB2(2-0)

Normally Offered: SP

Continues CON 231.

Prerequisite: CON 231.

CON 271 CONCRETE PIPE TECHNOLOGY2(2-0)

Normally Offered: On Demand

Course covers aggregate grading and blending, cementitious materials and the methods of curing used in the manufacturing of concrete pipe. Concrete pipe specifications, testing methods required and the multiple use of the end product are also covered. Lab testing of raw materials and pipe will be completed.

CONSTRUCTION

CST 101 CONSTRUCTION TECHNOLOGY I3(3-0)

Normally Offered:

This course is a study of the principles of Construction Technology. This course applies the concepts of Modern Carpentry, engineering and technology utilizing the framework of Green and Sustainability to Residential Construction.

CST 102 CONSTRUCTION TECHNOLOGY II3(3-0)

Normally Offered:

This course is a continuation of Construction Technology I. It is the study of the principles of Construction Technology. This course applies the concepts of Modern Carpentry, engineering and technology utilizing the framework of Green and Sustainability to Residential Construction.

CST 112 BUILDING CONSTRUCTION ANALYSIS3(3-0)

Normally Offered: SP

Studies construction designs and methods. Materials and methods of construction in the categories of wood, steel and concrete are covered individually to show the capabilities of each.

CST 151 CONSTRUCTION SUMMER CO-OP 6(0-6)

Normally Offered: SUM

Gives the student opportunity to gain “on-the-job” experience with summer employment in a construction firm or related business during the interval between the freshman and sophomore years.

CONSTRUCTION

CST 201 GREEN BUILDING SUSTAINABILITY..... 3(3-0)

Normally Offered: On Demand

This is a basic study of the principles of Green Building and Sustainability. Topics will include sustainability, xeriscaping, high performance building, energy efficiency, indoor air quality and environmental stewardship.

CST 214 BLUEPRINT READING & ESTIMATING 3(2-2)

Normally Offered: SP

Studies various types of residential and commercial building blueprints. Students analyze and interpret prints as to their content and estimate quantities and cost from excavation to completion.

CST 222 ADVANCED GREEN ENERGY SYSTEMS 3(3-0)

Normally Offered:

This course is the study of the principles of solar, wind, bio-mass fuels, nuclear and alternative energy. This course applies the concepts of advanced Green energy systems utilizing the framework of sustainability to Green Residential and Green Commercial Buildings.

CST 240 SUSTAINABILITY 3(3-0)

Normally Offered:

Sustainability is defined, demonstrated and applied, beginning with how the environment and ecosystems work from a scientific perspective, understanding climate and geology, and applying ecological stewardship to improve sustainability in our environment. Students will learn about implementing engineering and technology that focuses on sustainability.

CRIMINAL JUSTICE

CRJ 101 CRIMINAL JUSTICE PHYSICAL EDUCATION..... 3(1-2)

Normally Offered: SP

Designed for the Criminal Justice student that needs to improve his or her fitness level and lose weight. This is a low impact fitness course (i.e. walk/run, use of resistance bands, building endurance, introduction to weight training) with lectures on benefits of exercise and guidelines, fitness and wellness, coronary risk factors and physical fitness, stress, motivation, and behavior change, issues in weight control, and nutrition.

Prerequisite: Criminal Justice student or instructor permission. Participants with physical restrictions or other medical health problems must have a written permission statement from their physician prior to active participation in this program.

CRJ 110 CRIMINAL JUSTICE PHYSICAL EDUCATION..... 2(1-2-0)

Normally Offered: F

Physically prepares student to meet entry-level physical agility testing requirements for police officer and corrections officer and introduced military style discipline. Includes advanced development of exercise skills to increase and maintain levels of flexibility, muscle strength, body

composition and cardiovascular endurance. Instruction will be a military style workout, including running, upper body strength workouts, push-ups, sit-ups, leg lifts and jumping jacks.

Prerequisite: Criminal Justice student or instructor permission. Participants with physical restrictions or other medical health problems must have a written permission statement from their physician prior to active participation in this program.

CRIMINAL JUSTICE

CRJ 119 INTRODUCTION TO HOMELAND SECURITY..... 3(3-0)

Normally Offered: SP

The Introduction to Homeland Security course will define the role of the Federal, State and Local Governments when dealing with a terrorist attack from an emergency management and first responder perspective. The topic of what prompts people to engage in a terrorist attack will be explored. The student will learn how to prepare and recover from a terrorist attack. Finally, what future challenges emergency managers and first responders can expect to face when dealing with homeland security issues will be discussed.

CRJ 121 INTRODUCTION TO CRIMINAL JUSTICE 3(3-0)

Normally Offered: F

Surveys the field of law enforcement, including the role of police officers in society, the history of law enforcement and the organization of law enforcement agencies.

CRJ 131 INTRODUCTION TO CORRECTIONS..... 3(3-0)

Normally Offered: F

Covers the history and development of penology, treatment of convicted law violators of all ages, appraisal of correctional treatment on post correctional behavior and an evaluation of rehabilitative efforts in modern penology.

CRJ 132 INTRODUCTION TO COMPUTER FORENSICS & CYBERCRIME 3(2-2)

Normally Offered: SP

This course instructs the foundational skills necessary for the collection, evaluation, and investigation of computer crimes and electronic evidence. Lecture and lab sessions will explain how information is stored and retrieved from different types of devices.

Prerequisite: CRJ 121 and CIS 120; or CRJ 121 and CNS 230; or instructor consent

CRJ 211 ETHICS IN CRIMINAL JUSTICE 3(3-0)

Normally Offered: F

Introduces students and practitioners to the fundamentals of ethical theory, doctrines and controversies, and rules of moral judgment. Covers ways and means of making moral judgment. Addresses the state of ethics in police, corrections, probation and parole.

CRJ 220 JUVENILE DELINQUENCY 3(3-0)

Normally Offered: F

Analyzes the causes and control of crime, including juvenile delinquency, statistics of crime, problems of juvenile offenders, juvenile court procedures, and the work of youth agencies.

CRJ 221 CRIMINAL LAW 3(3-0)

Normally Offered: F

Consists of the study of the origin, nature, and purpose of substantive law with particular emphasis on the basic elements of the crimes, both statutory and common law. Criminal law topics covered are: Crime defined, sources of, legal limits, elements of, scope, defenses, crimes against people, habitation and property; offenses against government and justice.

CRJ 222 CRIMINAL PROCEDURES 3(3-0)

Normally Offered: SP

A basic survey of criminal procedure and constitutional rights as they apply to the criminal process from apprehension through the appellate process. Topics covered: Arrest, search and seizure, self-incrimination, pre-trial proceedings, trial, punishment, appeal, juvenile offenders, prisoner's rights, double jeopardy, confessions.

Prerequisite: Consent of instructor or CRJ 221.

CRJ 223 POLICE ADMINISTRATION 3(3-0)

Normally Offered: SP

Deals with staff functions, management, budgeting, training, public relations, record keeping and other areas of the administration of a law enforcement agency.

CRIMINAL JUSTICE

CRJ 224 POLICE OPERATIONS 3(3-0)

Normally Offered: SP

Deals with line functions: patrol operations, investigative divisions, traffic divisions, non-crime functions and basic organization of modern law enforcement agencies.

CRJ 229 CRIMINAL INVESTIGATION 4(3-1)

Normally Offered: SP

Introduces criminal investigation procedures, including conduct at crime scenes, collecting evidence, methods used in police laboratories and presentation of evidence in court.

CRJ 230 FIELD SERVICE PRACTICUM 3(3-0)

Normally Offered: F

Presents structured practical training with the student obtaining experiences which fit particular interests in law enforcement. Experiences are on campus or at local law enforcement agencies.

Prerequisite: CRJ 121, and all students must be at least 18 years of age and have completed the Hepatitis B shot series.

CRJ 233 COMMUNITY POLICING 3(3-0)

Normally Offered: F

Surveys the relationships between policing agencies and the communities which they serve. The emphasis is placed on communications and orientation toward common goals, with an examination of current problems in community tensions and conflict involving the police.

CRJ 234 MULTICULTURAL LAW ENFORCEMENT 3(3-0)

Normally Offered: SP

Multicultural Law Enforcement will provide practical guidelines on how the police can work with cultural groups in the community. This course will examine the historical context of police relationships and identify the key issues that must be addressed. This course will focus on the cross-cultural contact that police officers have with citizens, victims, and suspects from diverse backgrounds. Multicultural Law Enforcement will stress the need for awareness, understanding of cultural differences, and respect toward those of different backgrounds.

CRJ 235 CLIENT RELATIONS IN CORRECTIONS 3(3-0)

Normally Offered: SP

This course will examine the dynamics of human interaction within correctional facilities. Human relations in general will be presented to establish a basis for more specific examination of the unique and complex situation found in corrections. The meaning and impact of culture will be explored, as well as the causes and influence of prejudice on clients and corrections staff. Considerable discussion time will focus on values, ethics, and professional responsiveness.

CRJ 236 CORRECTIONAL CLIENT GROWTH & DEVELOPMENT..... 3(3-0)

Normally Offered: F

The purpose of this course is to give the student an understanding of and sensitivity to the motivations and behaviors of correctional clients. The course begins by reviewing general factors believed to be influential in human development, then analyzes specific problems of prisoners. The course examines prevention theories, as well as intervention and treatment strategies.

CRJ 237 CORRECTIONAL INSTITUTIONS & FACILITIES..... 3(3-0)

Normally Offered: SP

Provides the student with a concentrated overview of correctional institutions and facilities. Designed primarily for students intending to pursue a career in the criminal justice system or for those already employed within the system, this course has relevance to other students pursuing a social sciences orientation. The course explores federal, state, county, and local facilities, including maximum, close, medium, and minimum custody facilities. It addresses community facilities, co-educational facilities, and the safety and security requirements and considerations related to each. Constitutional and managerial issues are stressed. The course includes historical developments and philosophy.

CRIMINAL JUSTICE

CRJ 238 LEGAL ISSUES IN CORRECTIONS..... 3(3-0)

Normally Offered: F

This course studies state and federal law related to corrections. Particular emphasis is placed on constitutional issues and remedies for violations of rights. Students will gain insights into a wide range of policy considerations behind corrections law and administrative procedures. Leading cases and court decisions will be discussed at length and their impact on corrections explored.

CRJ 248 LOCAL CORRECTIONS OFFICER ACADEMY..... 10(6.5-5)

Normally Offered: SU

This course is certified by the Michigan Sheriff's Coordinating and Training Council. The Michigan Sheriff's Coordinating and Training Council has approved a 160-hour Local Corrections Officer Academy for correctional personnel supervising inmates in county jails. The Academy consists of 14 modules: Booking and Intake, Correctional Law, Cultural Diversity, Custody and Security, Defensive Tactics, Ethics, Fire Safety, First Aid/CPR/AED, Interpersonal Communications, Prisoner Behavior, Report Writing, Workplace Harassment, Stress Management, and Suicide Awareness. After the student has successfully completed the Academy and met all Michigan Sheriff's Coordinating and Training Council requirements, he/she will be certified by the Training Council as having completed the required 160-hour Academy.

DIRECTED STUDIES

251 DIRECTED STUDIES..... MAXIMUM 5

Aids advanced students or those who have exhausted regular offerings in their area of interest. The average student pursuing an associate degree will not find room in their program for this type of credit. The concept does not apply to remedial work. A directed study must be planned in advance of registration and cannot be used at the end of a semester to fill requirements. Careful attention must be given to the description of the work proposed because this constitutes the record of a course outline which is filed with the instructor, the Vice President of Instruction, and the Registrar's Office. The student is responsible for securing proper forms with all required signatures.

ECONOMICS

ECN 225 MONEY AND BANKING 3(3-0)

Normally Offered: On Demand

This course examines the role of money in society and the role of the financial system. Banking fundamentals and monetary policy are reviewed from a macroeconomic viewpoint. Focus is given to the contemporary issues relating to our monetary economic system. Students completing this course will have an enhanced knowledge of public monetary policy and how our banking system operates.

ECN 227 THE INTERNATIONAL POLITICAL ECONOMY.....3(3-0)
Normally Offered: On Demand

This course introduces students to the interdependence of national and regional issues as they relate to economics, sociology and political science. Study includes interests in the varying ways different regions and cultures throughout the world perceive the global economic institutions (WTO, EU, NAFTA, etc.) that are designed to supplement the management and distribution of our scarce global resources. Completion of this course will enable the student to recognize both the competitive and cooperative nature of international relationships and how they may effect domestic concepts and policies.

Prerequisite: Eligibility placement in MTH 121.

ECN 231 ECONOMICS (MICRO).....3(3-0)
Normally Offered: F, SP

This course focuses on the analysis of individual consumer and supplier behavior. Students will learn the basics of consumer demand theory, labor supply theory, price theory, and various production decisions in different types of competitive markets. Upon completion, students should have a fundamental appreciation and comprehension for the motivation of individual firms and consumers.

Prerequisite: Eligibility placement in MTH 113 or instructor permission.

ECONOMICS

ECN 232 ECONOMICS (MACRO).....3(3-0)
Normally Offered: F, SP

This course is a study of the behavior of the economy as a whole. It examines certain principles of aggregate behavior as suggested by the famous economist John Maynard Keynes and how certain deductions taken from microeconomic behavior effect the entire economy. Students who complete this course will have an improved understanding of our national economy and the critical economic issues of our times.

EDUCATION

EDU 121 INTRODUCTION TO EDUCATION3(3-0)
Normally Offered: F, SP

This is a basic introductory course into the discipline of teacher education. The primary objective of the course is designed to facilitate an understanding of “what it means to become a teacher in today’s society.” The course requires participation in the school environment through a 35-hour service project in which students learn to investigate and understand educational concepts through classroom and personal experience.

EDU 220 MULTICULTURAL EDUCATION3(3-0)
Normally Offered: SP (even years)

Provides a theoretical and empirical overview of educational issues affecting low-income immigrant and U.S.-born minority student populations in an increasingly diverse and changing society. Special attention is given to the transformative practices that enable students to dismantle inequality and struggle for a more democratic society.

Prerequisite: EDU 121 or SOC 123.

ELECTRICAL POWER TECHNOLOGY

EPT 230 POLY-PHASE METERING 3(2-2)

Normally Offered: SP

In this course, students learn about single-phase metering and poly-phase metering, including meter design, adjustments, compensations, and applications. They also learn about power factor analyzers, meter demand theory, high amperage CT cabinets and primary metering. Students will construct and test single-phase and poly-phase transformer rated meter installations.

Prerequisite: APP 100E.

Co-requisite: APP 104E.

ELECTRICAL SYSTEMS TECHNOLOGY

EST 301 POWER SYSTEMS 3(3-0)

Normally Offered: SP

This course applies electrical theory accompanied with physics to electrical systems including power flows, system design, and load management of different types of electrical power systems.

Prerequisite: PHY 221, EST 302, EST 304.

Co-requisite: PHY 222.

EST 302 CIRCUITS 4(4-0)

Normally Offered: F

Course covers circuit analysis of DC circuits (resistance, capacitance, inductance) and AC circuits; DC power and energy calculations; DC power consuming devices and harmonics; conversion of AC to DC and brief introduction of DC power electronics; defines phasors complex power and impedance; mathematical calculations showing AC power and energy; apply metering theories to determine system qualities such as electricity power and energy; and using basic calculus to show how energy is power integrated over time.

Prerequisite: APP 104E.

Co-requisite: PHY 221.

ELECTRICAL SYSTEMS TECHNOLOGY

EST 304 PHASOR ANALYSIS/THREE PHASE POWER 3(3-0)

Normally Offered: F

Course uses trigonometric functions showing sinusoids; why three phase and not two or four? Compare the different types of three-phase systems (Wye, Delta, grounded, ungrounded). Course covers transforming the AC time domain into phasors for analysis of steady state systems. Vector quantities and vector math.

Prerequisite: APP 104E.

Co-requisite: PHY 221.

EST 306 ELECTRIC POWER GENERATION 3(3-0)

Normally Offered: F

Course covers DC, AC, single-phase, and three-phase rotating machines; synchronous and asynchronous motors and generators; types of generators and turbines; DC vs AC generation; conservation of energy during generation, i.e. losses of mechanical energy to electrical energy.

Prerequisite: APP 104E.

Co-requisite: PHY 221, EST 302, EST 304.

EST 307 INTRODUCTION TO COMPUTER MODELING OF POWER SYSTEMS 3(2-2)

Normally Offered: S

Course covers power system parameters and what they mean in the model; how power system components' and lines' impedances determine how energy flows. Uses computer models of electric systems to accurately control and predict the electric grid.

Prerequisite: EST 301.

EST 308 DISTRIBUTION/TRANSFORMER POWER3(3-0)

Normally Offered: F

Course is designed to provide a broad overview of the transmission of electricity versus the distribution of electricity.

Prerequisite: EST 306.

Co-requisite: EST 301.

EST 401 RENEWABLES3(3-0)

Normally Offered: F

Course provides an overview of modern types of renewable generation sources. Included are photovoltaics (solar), wind, wave, and geothermal.

Prerequisite: EST 306.

EST 402 SCADA3(2-2)

Normally Offered: F

Course covers Supervisory Control And Data Acquisition (SCADA) Systems and what they do; implementing and operating existing SCADA systems; SCADA components such as PLC's, relays, contracts, and communication schemes.

Prerequisite: IND 120, APP 114E.

EST 403 PROTECTION3(3-0)

Normally Offered: S

Course covers the protection of the system from anomalies; general protection rules and why the system needs such protection; protection devices such as fuses, sectionalizers, reclosures, circuit switchers, and breakers; and coordination of protection devices.

Prerequisite: EST 301.

EST 404 POWER LINE PARAMETERS3(3-0)

Normally Offered: SP

Course is a basic introduction to power line and system parameter calculations; finding X/R ratios for short, medium, and long lines; wire and cable properties, resistivity/conductivity; and power line construction efforts.

Prerequisite: EST 301

Co-requisite:.406

ELECTRICAL SYSTEMS TECHNOLOGY

EST 405 RELAYING3(2-2)

Normally Offered: S

Course covers the three generations of relaying, electromechanical, solid-state, and microprocessor; relay functions and operations i.e. 50/51 Instantaneous/Time overcurrent; testing relays; general relaying principles such as protection zones, and proper relay connections.

Prerequisite: EST 301.

EST 406 THE GRID3(3-0)

Normally Offered: F

Course covers the history of the grid; why AC dominated over DC; the elements of the electric grid i.e. Generation, Transmission, Distribution, and Consumption; and Independent System Operators.

Prerequisite: EST 301, EST 306.

Co-requisite: EST 404.

EST 408 ELECTRICAL SYSTEMS CAPSTONE PROJECT 3(2-2)

Normally Offered: S

Course covers safety practices in the electric utility industry, print reading, and assigns a capstone project that will require students to use knowledge gained in prior courses to complete.

Prerequisite: EST 308, EST 404.

Co-requisite: EST 307, EST 403, EST 405

ELECTRONICS

ELE 220 PC BASE DATA ACQUISITION & CONTROL 3(2-2)

Normally Offered: SP

An introduction to Data Acquisition (DAQ), signal conditioning, sensors, digital and analog inputs and outputs, instrumentation communications, and basic controls. Through projects, students will learn how to setup, program, build, and troubleshoot PC-based DAQ and control systems.

Prerequisite: APP100E and basic computer proficiency recommended.

ENGINEERING

EGR 122 INTRODUCTION TO ENGINEERING 1(1-0)

Normally Offered: F

Introduces the student to the profession of engineering. Topics include engineering colleges and curricula, scholarships and other financial aid, engineering work-study (co-op) programs, work opportunities, salaries, professional responsibilities and engineering registration. Field trips to Alpena area industries that employ engineers acquaint the student with practical applications of engineering.

EGR 130 TEAM DESIGN PROJECT 2(1-2)

Normally Offered: SP

This project based course utilizes each student's diverse skills in a semester long development of a project or projects selected by the class. The course is structured as a company with multiple projects and objectives designed to give students real world project experience. Students will work in teams. Each team will progress through all stages of a project – conception, design, build, redesign, and formal presentation. Each student is assigned a part of the project with a required written report that is in line with their skills and interests. This course is open to all students; however, priority is given to Marine Technology, Mechanical Design Technology, and Pre-Engineering students.

Prerequisite: Permission of Instructor.

EGR 221 STATICS 3(3-0)

Normally Offered: F

Covers the fundamental principles of mechanics with engineering applications. Topics include forces, moments, machines, structures, friction, hydrostatics and virtual work.

Prerequisite: PHY 221, MTH 231 (may be taken concurrently).

ENGLISH

ENG 090 FUNDAMENTALS OF WRITING 4(4-0)

Normally Offered: F, SP

Provides remedial instruction for college freshmen who have demonstrated very limited ability in communication skills. The major emphasis is on the sentence (including basic usage, vocabulary, grammar, punctuation, and sentence combining skills), leading to the composition of paragraphs.

Prerequisite: None. E-Write 3 or below.

Co-requisite: CSS 095, CSS 100, MTH 090, or instructor permission.

ENG 102 BASIC ENGLISH.....4(4-0)

Normally Offered: F, SP

Provides remedial instruction for college freshmen who have demonstrated limited ability in communication skills. Students first learn paragraph development and then expand their writing to longer essay-length writings. Classroom practice and laboratory instruction focus on writing skills to improve students' appropriate use of Standard English in their writing. This course prepares students for entry into the traditional freshman level composition sequence.

ENG 111 ENGLISH COMPOSITION I3(3-0)

Normally Offered: F, SP, SUM

Provides basic instruction for the college freshman in communication skills. Reading skills are developed through the analysis of essays. Writing skills are developed through a study of expository writing, language usage, structure, and mechanics.

Prerequisite: Average competence in reading and writing skills as determined by placement tests. (A minimum of a 12th grade reading level is required for placement in this course.)

ENG 112 ENGLISH COMPOSITION II3(3-0)

Normally Offered: F, SP, SUM

Non-fiction and short fiction materials are used to further develop written communication skills introduced and practiced in ENG 111. Special emphasis is placed on critical thinking, critical analysis, and research leading to academic writing.

Prerequisite: Grade of 2.0 or better in ENG 111 or ENG 121.

ENG 120 APPLIED COMMUNICATIONS3(3-0)

Normally Offered: F

Coordinates education in the technical and the academic fields. The course demonstrates the application of academic concepts by relating these concepts to technical subjects. Students review the types of communication skills needed in the workplace. This course is not intended for transfer students.

Co-requisite: Enrollment in one of the following programs: Automotive Service & Repair, Computer-Aided Drafting & Design, Concrete Technology, Machine Tool Technology.

ENG 121 ADVANCED ENGLISH COMPOSITION I3(3-0)

Normally Offered: F

Provides instruction for the college freshman who has demonstrated above-average ability in communication skills. The instructor uses essays to teach a variety of expository writing forms.

Prerequisite: Above-average competence in grammatical/writing skills as determined by the English Dept. and placement tests.

ENG 122 ADVANCED ENGLISH COMPOSITION II3(3-0)

Normally Offered: SP

Non-fiction and short fiction materials are used to develop further the written communication skills introduced and practiced in ENG 121. Special emphasis is placed on critical thinking, critical analysis and research leading to academic writing.

Prerequisite: Grade of 2.0 or better in ENG 111 or ENG 121.

ENGLISH

ENG 123 TECHNICAL COMMUNICATION3(3-0)

Normally Offered: SP

Develops practical written communication skills for the workplace. Students design and prepare a variety of conventional technical and business documents, including business letters, memoranda, job application materials, short reports, empirical and comparative studies,

instructional manuals and proposals. Topics include purpose and audience analysis, text production, page layout and document design.

Prerequisite: ENG 111 or ENG 120 or ENG 121 or consent of instructor.

ENG 203 INTRODUCTION TO MYTHOLOGY3(3-0)

Normally Offered: F

Studies myths from several cultures. They are examined from the perspective of their common themes and capacity to be transformed through time while maintaining their universal motifs. Attention is also focused on the functions of mythology, including a primary one of providing guidance for the individual through important passages of life. Several works of literature are examined to demonstrate the mythic process at work and the fundamental part that myth plays in literary expression.

Prerequisite: Sophomore standing or permission of instructor.

ENG 204 INTRODUCTION TO LITERATURE.....3(3-0)

Normally Offered: SP (odd years), SU

Introduces students to three basic forms of imaginative literature: short fiction, poetry, and drama. Instructs students in the skills to appreciate, enjoy, and critically analyze such literary texts. Components of the course include themes, formal elements, and critical approaches.

Prerequisite: ENG 111 or 121 and sophomore standing, or permission of instructor.

ENG 221 BRITISH LITERATURE I3(3-0)

Normally Offered: On Demand

Helps the student read literature with understanding and appreciation. The course consists of the study of representative English fiction, poetry and drama.

Prerequisite: ENG 112 or ENG 122.

ENG 222 BRITISH LITERATURE II3(3-0)

Normally Offered: On Demand

Continues ENG 221 British Literature I.

Prerequisite: ENG 112 or ENG 122.

ENG 223 AMERICAN LITERATURE I3(3-0)

Normally Offered: On Demand

This is the first semester of a two-semester survey of American literature, beginning with readings from the colonial conquest period, covering the Puritan writings of the 17th century, the Deist and Rationalistic writings of the American Revolution, early Romanticism, and ending with works of the abolitionists and Transcendentalists at approximately the time of the Civil War. Readings will consist of classic American works, as well as those of lesser known writers, and will sample several genres to provide variety and a broader insight into American thought.

Prerequisite: ENG 111 or ENG 121 and ENG 112 or ENG 122.

ENG 224 AMERICAN LITERATURE II3(3-0)

Normally Offered: F (odd years)

This second semester of a two-semester survey of American literature, begins approximately at the time of the Civil War and leads into a study of contemporary literature. Emphasis will be placed on the historical development of American thought and literature, with an effort to include culturally diverse writings that may have been previously excluded from American literature. The course will also sample various genres and diverse regions of the country, as well as represent different schools of writing, such as Naturalism, Realism and Modernism.

Prerequisite: ENG 111 or ENG 121 and ENG 112 or ENG 122.

ENGLISH

ENG 229 CREATIVE WRITING.....3(3-0)

Normally Offered: F

Develops skills in writing one or more of the following forms: the short story, the play, the poem and the essay. The students meet individually with the instructor for criticism of their manuscripts. The class meets regularly to discuss common problems and successes.

Prerequisite: Grade of 2.0 or better in ENG 111 or 121.

ENG 242 CHILDREN'S LITERATURE.....3(3-0)

Normally Offered: F (even years), SP

Provides the second semester freshman and sophomore student with a general understanding of the development and uses of children's literature from its beginning to the present. Methods of analysis of both fiction and non-fiction prose as well as poetry are emphasized.

Prerequisite: Grade of 2.0 or better in ENG 111 or ENG 121

ENG 243 THE SHORT STORY3(3-0)

Normally Offered: SP

This course presents an intensive study of the short story as a literary form. In addition to its primary focus on formal elements, the course considers historical context/development, author biography, and critical theory. Readings are drawn from a variety of international, as well as American literary sources.

Prerequisite: ENG 111, ENG 121, or Instructor permission

ENG 244 THE NOVEL3(3-0)

Normally Offered: F, SP

Presents an intensive study of the novel as a literary genre. Concentration on how the formal elements of the novel (such as narrative technique, point of view, tone, plot, character development, style and the structure of time and place) define the theme the novelist is presenting. The readings for the course are selected from representative novels. Some written work is a partial requirement for the course.

ENVIRONMENTAL SCIENCE

ENV 101 ENVIRONMENTAL SCIENCE.....4(3-2)

Normally Offered: F

This course analyzes environmental issues, including ecology, natural cycles, populations, energy, and human impact on the environment. Politics, public policy, and sustainability will be discussed. The lab portion will include outdoor experiences.

FRENCH

FRN 121 FRENCH I4(4-0)

Normally Offered: F, SP

This is a basic French course designed to introduce the French language to students, giving them a rudimentary knowledge of written and spoken French. Six skills will be addressed: reading, writing, listening, speaking, pronunciation, and translation. These skills will be developed throughout the course through instruction, drill, choral response, readings, music, and class interaction. Systemic grammar instruction as well as whole-language techniques will be incorporated to enhance learning. Students will also be introduced to French culture, literature, geography, famous persons, and history through a variety of media. Students who already have a strong background in French, e.g., having had more than two years in high school or other institutions, should refrain from taking this elementary class since it is intended for beginners. FRN 122 French II, which is offered in the spring semester, will be a better course for stronger students.

FRN 122 FRENCH II4(4-0)

Normally Offered: F, SP

This second semester of college French corresponds roughly to one to two semesters of high school French. This basic French course will focus on the continued development of linguistic skills, i.e., reading, listening, speaking, and pronunciation, with emphasis on the written language.
Prerequisite: FRN 121 or two semesters of high school French.

GEOGRAPHY

GEO 125 GEOGRAPHY **3(3-0)**

Normally Offered: On Demand

Analysis of characteristics and significance of world land form, climate, soils, vegetation, mineral and water resources, as well as tectonic and glaciation forces.

GEO 126 CULTURAL GEOGRAPHY **3(3-0)**

Normally Offered: SP

Introduction to the theme of human alterations of the natural scene and creation of cultural landscapes from ancient times to the present.

GEO 127 PHYSICAL GEOGRAPHY **4(3-2)**

Normally Offered: F

Analysis of characteristics and significance of world land forms, climate, soils, vegetation, mineral and water resources, as well as tectonic and glaciation forces. This course includes a laboratory component and complies with MTA requirements.

GEO 151 INTRODUCTION TO GIS **1.5(1-1)**

Normally Offered: SP

Introduces principles of geographical information systems (GIS) in an ArcGIS software environment, providing the student with fundamental knowledge of GIS system components and how to utilize ArcGIS software in the creation of maps and analysis of spatial data. Students will also gain basic experience with the use of global positioning system (GPS). Applications will be cross disciplinary in nature, including such fields as the environmental sciences, oceanography, business, marketing, demographics, history, tourism, and real estate management.

Prerequisite: Satisfactory completion of CSS 098 or ACCUPLACER placement in ENG 111.

GEO 152 ADVANCED GIS **1.5(1-1)**

Normally Offered: SP

Continues utilization of GIS technology in an ArcGIS software environment. Previously learned principles are reviewed and their use expanded. More advanced spatial data analysis, editing, and geocoding concepts and methods are introduced. As a final project, students will collect field data using a GPS unit and create a formal GIS map for presentation. Applications will be cross disciplinary in nature, including such fields as the environmental sciences, oceanography, business, marketing, demographics, history, tourism, and real estate management.

Prerequisite: GEO 151.

GERMAN

GER 123 GERMAN **4(4-0)**

Normally Offered: F

An introductory course for anyone interested in developing basic speaking, reading, listening and writing skills in the German language. No previous experience with German is required.

GER 124 GERMAN **4(4-0)**

Normally Offered: SP

A second semester level course for anyone interested in developing and improving their basic speaking, reading, listening and writing skills in the German language.

Prerequisite: GER 123 or other previous experience with German is required

HEALTH

HEA 102 NUTRITION 3(3-0)

Normally Offered: FA, SP

This course offers information about human nutrition and how it influences personal health. Emphasis is placed on current nutritional research; U.S. Government guidelines and goals; U.S. RDA's human nutritional needs of foods; human energy needs of foods; human growth and development; and nutrition and human performance.

HEA 107 HEALTH CARE ASSISTANT 6.9(6.9-0)

Normally Offered: F, SP

This course allows the student to develop the basic skills and knowledge required to provide human services to individuals in a home or institutional setting. Topics include resident rights, communication, infection control, safety, personal care, nutrition, psychosocial care, activity planning, care across the lifespan, problem solving and home management.

Co-requisite: CIS 120, ENG 111, NUR 133, HEA 107LC, and HEA 113.

HEA 107LC HEALTH CARE ASSISTANT LAB COURSE 0.8(0-2.4)

Normally Offered: F, SP

This course allows the student to develop and apply the basic skills required to provide human services to individuals in a home or institutional setting. Skills include standard precautions, hygiene care, infection control, safety measures, activities of daily living, nutrition, psycho-social care, problem solving, and home management.

Co-requisite: CIS 120, ENG 111, NUR 133, HEA 107, and HEA 113.

HEA 113 HEALTH CARE ASSISTANT CLINICAL 0.8(0-0-2.4)

Normally Offered: F, SP

This course allows the student to practice skills obtained in HEA 107 and 107LC in the extended care environment. Proficiency must be demonstrated in real life situations related but not limited to standard precautions, hygiene care, infection control, safety measures, activities of daily living, nutrition, psycho-social care, problem solving, and home management.

Co-requisite: CIS 120, ENG 111, NUR 133, HEA 107, and HEA 107LC.

HISTORY

HST 121 HISTORY OF WESTERN CIVILIZATION 3(3-0)

Normally Offered: F

Studies the emergence of Europe from the Ancient World through the Dark Ages and Feudalism into the modern state system. Also studies the rise of modern capitalism and the impact of the new emerging social structure upon intellectual and religious life.

HST 122 HISTORY OF WESTERN CIVILIZATION 3(3-0)

Normally Offered: SP

Studies the revolutionary destruction of the old regimes, the establishment of liberal parliamentary democracies and the rise of the totalitarian movements in the present era of global conflict.

HST 140 UNITED BY WATER: UNDERWATER ARCHAEOLOGY & MARITIME HISTORY 3(2-2)

Normally Offered: SU

This course explores the interdisciplinary study of shipwrecks and the maritime landscape found within the Thunder Bay National Marine Sanctuary through the exploration of the maritime history of the Great Lakes and examining how the region played a critical role in the growth of the nation. The course also introduces students to the theory and practice of underwater archaeology. Students will gain hands on experience with archaeological recording techniques and basic underwater archaeological mapping skills. The field techniques used in this course are versatile and skills can be applied in a variety of fields. The course contains practical, hands-on sessions

that teach underwater surveying and recording. The practical elements of the course could be held in sheltered open water or on a shore site for non-divers. Diving not required. Completion of course can result in certification(s) from Nautical Archaeology Society.

HISTORY

HST 221 UNITED STATES HISTORY.....3(3-0)

Normally Offered: F

This course surveys the history of the United States from the period of colonization to reconstruction. The course is designed to achieve breadth of understanding and appreciation for social, political, economic and cultural history of the United States within a global context and while emphasizing the responsibilities of citizenship for students with broad academic and professional interests. The topics include pre-European society in the Americas, European settlement, colonial development, the development of constitutional government and representative democracy, social and economic development, the western territorial expansion of the United States, sectionalism and the Civil War.

HST 222 UNITED STATES HISTORY.....3(3-0)

Normally Offered: SP

Surveys the history of the United States from the period of Civil War reconstruction to the present time. This course is designed to achieve breadth of understanding and appreciation for the social, political, economic and cultural history of the United States within a global context and while emphasizing the responsibilities of citizenship for students with broad academic and professional interests. The topics include the Civil War and its causes, the period of post-war reconstruction, the expansion of industrialization and subsequent implications for the socio-political order, the Gilded Age, the Progressive Era, World War I, the Great Depression and the New Deal, World War II, and the Cold War and Post-Cold War era.

HST 224 HISTORY OF MICHIGAN3(3-0)

Normally Offered: F, SP

This course traces the history of Michigan from ancient times through French and British rule. It relates the growth of Michigan as a territory and state within the national union, drawing connections with regional, national and international social, political and economic trends into the present.

HST 225 TWENTIETH CENTURY U.S. HISTORY3(3-0)

Normally Offered: SP (odd years)

This course aims to increase the student's factual and structural knowledge of the social, political, economic and foreign and domestic developments of the United States since 1900, providing great detail and breadth of understanding, appreciation and global context for students with broad academic and professional interests.

HST 227 CONTEMPORARY AMERICAN PROBLEMS3(3-0)

Normally Offered: F, SP

Surveys the current social, political, economic and cultural domestic and international problems facing the United States and the region (state and local) in which the student lives. Ideological, economic, and social factors are stressed within an historical perspective. Considerable emphasis is placed on relating these issues to the student's own local environment and their personal and professional interests.

HST 228 THE CIVIL WAR3(3-0)

Normally Offered: SP (odd years)

Introduces the causes of the war between the North and the South. Emphasizes the shifting tide of battle during that period, as well as the subsequent impact of the war on American culture.

HUMANITIES

HUM 110 INTRODUCTION TO OLD TESTAMENT LITERATURE 3(3-0)

Normally Offered: F

Introduces the student to the Old Testament canon, its historical antecedents and development, cultural setting, literary styles, and subject matter. Attention is given to the importance of the Old Testament's leading ideas in developing Western culture. Critical problems related to the ancient texts will be introduced in the context of Medieval and modern debates.

HUMANITIES

HUM 114 INTRODUCTION TO NEW TESTAMENT LITERATURE 3(3-0)

Normally Offered: SU

Introduces the student to the New Testament canon, its historical antecedents and development, cultural setting, literary styles, and subject matter. Attention is given to the importance of the New Testament's leading ideas to developing Western culture. Critical problems related to the ancient texts will be introduced in the context of Medieval and modern debates.

HUM 210 INTRODUCTION TO CINEMA 3(3-0)

Normally Offered: F, SP

This course provides a broad introduction to the study of film. Emphasis will be placed on a particular genre while exploring certain historical and contemporary pieces of cinematic art for examination, analysis, and evaluation. Filmmakers, important schools of filmmaking, and film production will also be investigated.

HUM 241 HUMANITIES I 4(4-0)

Normally Offered: F, SP

Introduces the student to the terminology, ideas, concepts and attitudes that are needed to be able to appreciate, describe, interpret and evaluate humanities and art-related artifacts. Special emphasis is placed on the interrelationships among the visual and performing arts, as well as between these arts and other humanities, including literature, history, philosophy and religion.

HUM 242 HUMANITIES II 4(4-0)

Normally Offered: SP

Continues to develop the terminology, ideas, concepts, and attitudes that are needed to be able to appreciate, describe, interpret, and evaluate Humanities and art-related artifacts. In addition, Humanities II further emphasizes the interrelationships amongst the arts — including but not limited to sculpture, architecture, painting, and film — and examines how these art forms aid in the process of self-discovery.

Prerequisite: HUM 241 or permission of instructor

INDUSTRIAL

IND 110 INDUSTRIAL ORGANIZATIONS 3(3-0)

Normally Offered: On Demand

A detailed survey of organizational theories and structures, operational, financial, marketing, and accounting activities; duties of management, planning, control, personnel, safety, wages, policy and human factors necessary for effective management of an industrial organization.

IND 120 INDUSTRIAL COMPUTERS & NETWORKING..... 3(2-2)

Normally Offered: F

An introduction to computers and networks as used in an industrial setting. The course will start with the basics of computer usage and file management and work up to hands on building of basic industrial networks between personal computers and instrumentation.

IND 225 STRENGTH OF MATERIALS..... 4(3-2)

Normally Offered: F

This course employs a practical approach to stress, strain, shear, torsion, and moments found in mechanical and construction design. Bolted and welded constructions, axial tension and compression members, shafts, beams, columns, and trusses will be studied. Shear and moment diagrams will be used to analyze beams. Lab testing of the strengths of materials will be utilized.

Prerequisite: MTH 102 or higher.

IND 229 HYDRAULIC & PNEUMATIC POWER.....3(2-2)

Normally Offered: F

An introduction to hydraulic and pneumatic principles and components. Covers primary laws and formulas, calculations, schematics, design considerations, and troubleshooting. Consists of lectures, hands-on labs, and projects.

Co-requisite: MTH 110 or higher.

LAW

LAW 125 INTRODUCTION TO LEGAL PRINCIPLES AND COURT SYSTEMS3(3-0)

Normally Offered: F

Introduces the American legal system, including the philosophy of law and the principles on which legal rules are based. Shows the origin and development of law, types of law and how they function in society. Examines lawmaking institutions and their evolution in the U.S. with a focus on Michigan courts. Covers the different kinds of substantive law and how one goes about using the law. Emphasis on recognition of legal issues and terminology.

LAW 239 FAMILY LAW4(4-0)

Normally Offered:

Studies areas of family law including marriage contracts, divorce, separation, child custody and support, adoption, child abuse and neglect, guardianship and conservatorship.

Prerequisite: LAW 125.

LAW 240 LEGAL RESEARCH AND WRITING I.....3(3-0)

Normally Offered: F

Introduces legal research, including use of a law library. Students complete research assignments utilizing publications from law library; learn to analyze court opinions and apply them; and write summaries of court opinions, legal memoranda, briefs, appellate briefs and other legal documents. Includes basic legal reasoning and writing skills for organized problem-solving and sets for the scope of language in the law office.

Prerequisite: ENG 112 or ENG 122, CIS 152, LAW 125.

LAW 241 LEGAL RESEARCH AND WRITING II.....3(3-0)

Normally Offered: SP

Reviews principles of legal research, analysis and writing. Introduces computer-assisted research. Students will draft legal memoranda, opinion letters and an appellate brief based on extensive research assignments.

Prerequisite: LAW 125, LAW 240.

LAW 242 PROBATE LAW, WILLS, TRUSTS, AND ESTATES3(3-0)

Normally Offered: SP

Studies probate law, including wills, estates, estate planning and trusts. Emphasis on document preparation.

Prerequisite: LAW 125 or instructor's permission.

LAW 243 LEGAL ASSISTANT PROFESSION AND ETHICS.....3(3-0)

Normally Offered: SP

In-depth study of Michigan Rules of Professional Conduct and the code of judicial conduct and their application to attorneys, legal assistants and judges. Particular focus on confidentiality, conflict of interest, legal advertising, competency considerations, legal malpractice and the unauthorized practice of law.

Prerequisite: LAW 125.

LAW 244 CIVIL PROCEDURE4(4-0)

Normally Offered: F

Provides understanding of civil law procedures with a review of the preparation of basic pleadings, including summons, complaint, answer, counter-complaint, motions, interrogatories and depositions, preparation for trial, court orders and appeals. Methods may be drawn from practical situations in wills, trusts, family law, property law and personal injury.

Prerequisite: LAW 125 or instructor's permission.

MANUFACTURING TECHNOLOGY

MFG 101 MACHINING PROCESSES I4(2-4)

Normally Offered: F

Students will receive instructions on shop safety, measuring instruments, layout, and bench work. They will also receive instructions on lathes, milling machines, drill presses, pedestal grinders, saws, and basic CNC operations.

MANUFACTURING TECHNOLOGY

MFG 102 MACHINING PROCESSES II4(2-4)

Normally Offered: SP

Continuation of Machining Processes I with more specialization in machine setups. Topics include: precision grinding, lathe inside thread cutting, mill boring, broaching, the use of indexable cutting tools, CNC machining operations, lean manufacturing, and advanced methods of inspection.

Prerequisite: MFG 101.

MFG 120 PRINT INTERPRETATION & PROCESSES3(2-2)

Normally Offered: F

Introduces blueprint symbols and their meanings as used in a manufacturing operation. Provides instruction and practice to develop skill in spatial visualization, sketching, including auxiliary and sectional views, design standards, detail and assembly drawings, geometric dimensioning rules and tolerances, thread callouts, title blocks, material lists, and notes for use by various manufacturing personnel. Including machining and welding processes also covers examination and testing of welds.

MFG 122 MANUFACTURING PROCESSES3(3-0)

Normally Offered: F

This course provides an introduction to understanding manufacturing: the manufacturing business, classifications of manufacturing, design process, graphical language, advantages and limitations, materials, process capabilities, selection, cost analysis, quality assurance, and application. The course will study plastics, metals, ceramics, and composites along with forming, cutting, joining, and finishing technologies.

MFG 201 CNC I4(2-4)

Normally Offered: F

This is an introductory course for CNC machinery. Students will develop safe working habits and calculate machine speeds and feeds of milling machines and lathes. They will study the Cartesian coordinate system, absolute and incremental positioning, and datum and delta dimensioning for

CNC machines. Math for CNC programming and calculation of linear and circular interpolation will be covered.

Prerequisite: MFG 101, or instructor permission.

MFG 202 CNC II4(2-4)

Normally Offered: SP

This is a follow-up course for MFG 201 Introduction to CNC and MFG 204 Computer Aided Manufacturing courses. Students will learn how to set up and run various types of computer numerical control machines and associated tooling, as well as CMM inspection of the finished parts. The student will also use machine conversational controls and CAD/CAM to create CNC programs, master records and inspection sheets.

Prerequisite: MFG 201, and MFG 220, or permission of instructor.

MFG 204 COMPUTER-AIDED MANUFACTURING3(2-2)

Normally Offered: F

Provides the student with the basic knowledge of Computer Aided Manufacturing (CAM) systems and how to manipulate various types of Computer Aided Drafting (CAD) data in the creation of Computer Numerical Control part programs. The student will create CNC programs, tooling set-up sheets, process sheets, and fixture sheets to create a CNC master record. Calculations for proper Speeds and Feeds will also be required. The programs created in this course will run on machines in MFG 202 CNC II.

Prerequisite: MFG 101, basic computer skills, or permission of instructor.

MFG 205 CNC III4(2-4)

Normally Offered: F

This is a follow-up course for MFG 201 CNC I, MFG 202 CNC II, MFG 204 Computer-Aided Manufacturing, and MFG 220 Jigs and Fixture design Fundamentals. This is a lab only course designed to give the student an experience similar to working in a job or production shop. The student will apply all previous classes by being required to design parts in CAM, apply fixturing using multiple set-ups, inspect the parts using CMM and optical comparators, apply change orders to parts, and produce a master record.

Prerequisite: MFG 202, MFG 204, and MFG 220, or permission of instructor.

MANUFACTURING

MFG 210 GREEN MANUFACTURING AND SUSTAINABILITY3(3-0)

Normally Offered:

This course covers how environmentally conscious decisions can impact the processes involved in manufacturing and organizational management. Green Revolution, green standards and certifications for manufacturing and business, including global guidelines are core concepts. Students will work through a road map to a green organization and understand ISO programs for sustainability.

MFG 220 JIGS AND FIXTURE DESIGN FUNDAMENTALS4(2-4)

Normally Offered: F

This is a tool design course using Autodesk® (Fusion 360) software. It covers types and functions of jigs, CNC fixtures, and check gauges. Included in the design process are part nesting, locating, clamping, work holding, and application of commercially available tool components. The complete design includes economic tool budgets, proper application of tolerances and datums, selection of materials, and generation of complete working drawings. Fixture designs in this course will be used in MFG 202, CNC II, and MFG 205, CNC III.

Prerequisite: MFG 201 or instructor's permission.

MARINE TECHNOLOGY

MRT 101 INTRO TO SUBMERSIBLE ROBOTICS WITH BUILD3(2-2)

Normally Offered: F

An introductory hands-on course for anyone with an interest in submersible technology and/or working with underwater robotics. This course follows International Marine Contractors Association's (IMCA) Guidance for the Safe and Efficient Operations of Remotely Operated Vehicles (ROV) with a heavy emphasis on hands-on operations and working in the field.

MRT 110 INTRODUCTION TO CAREERS ON THE WATER2(1-2)

Normally Offered: SU

This course is a hands-on introduction to marine technology related careers that perform work on, under, and near the water. Through a partnership with the Thunder Bay National Marine Sanctuary, students will have the opportunity to experience working on the water through the lens of maritime archaeological research. This includes exposure to technology, methodologies, and research vessel operations that apply to a wide range of on-the-water career paths. Topics include: careers on the water, maritime archaeology, remote sensing theory and practice, Great Lakes maritime heritage and culture, ocean and Great Lakes conservation issues, and safety on the water.

MRT 210 ROV PILOTING.....2(1-2)

Normally Offered: SU

This course is a hands-on introduction course in piloting underwater Remotely Operated Vehicles (ROV). Students will have the opportunity to launch, pilot, navigate, and recover an actual ROV. They will be trained on the basic operations of small observation class ROVs to the large work class ROVs used in deep ocean work.

MATHEMATICS

To enter a new mathematics course or continue a sequence, a grade of 2.0 or higher in any prerequisite course is recommended. SAT or ACCUPLACER scores will also be used as guides in placing new students in mathematics courses.

MTH 090 ARITHMETIC4(4-0)

Normally Offered: F, SP, SUM

Provides a foundation in the four basic operations on whole numbers, fractions, decimals, percentages, and applications of these processes in every day problem solving. A remedial mathematics course using an open classroom approach.

MATHEMATICS

MTH 102 ELEMENTARY ALGEBRA5(5-0)

Normally Offered: F, SP, SUM

Covers natural numbers, signed numbers, fractions, radicals, products, factors, first-degree equations in one and two variables, inequalities, graphing and quadratics. A one-semester remedial course in beginning algebra for those students who have not taken an algebra course or who have a deficiency in first year algebra.

Prerequisite: MTH 090 with a grade of 2.0 or higher, or by ACCUPLACER placement.

MTH 110 TECHNICAL MATH I3(2-2)

Normally Offered: F, SP

This course is designed for those who will apply mathematics to various technical fields. Topics covered include a review of basic arithmetic, units of measure, algebra fundamentals, simple equations and formulas, geometric principles, and calculator usage will be introduced. In all areas there is strong emphasis placed on solving industrial applications.

Prerequisite: MTH 090 or equivalent.

MTH 111 MATHEMATICS FOR ELEMENTARY TEACHERS I.....3(3-0)

Normally Offered: F

Includes historical and present numeration systems, real number systems for concept of set through systems of natural numbers, whole numbers, integers and rational numbers, geometric concepts from set viewpoint, irrational numbers, operations and properties applied to mathematical sentences, square root, cube root, and metric system. A required course for elementary teachers.

Prerequisite: MTH 102 with a grade of 2.0 or better or successful completion of one year of high school algebra.

MTH 112 TECHNICAL MATH II3(2-2)

Normally Offered: SP

This course is a continuation of MTH 110 Technical Math I, which places emphasis on applying mathematics to various technical industrial fields. Topics covered include advanced algebra, trigonometry, geometry, quadratics, statistical process control, and calculator usage. In all areas there will be a strong emphasis placed on solving practical industrial applications.

Prerequisite: MTH 110 or permission of instructor.

MTH 113 INTERMEDIATE ALGEBRA4(4-0)

Normally Offered: F, SP, SUM

Reviews the important topics considered in the first year of high school algebra or MTH 102. Further work on factoring, fractions, equations, functions and graphs, exponents and radicals, quadratics and logarithms. Does not count toward a major or minor in mathematics.

Prerequisite: A grade of 2.0 or higher in MTH 102, or by ACCUPLACER placement.

MTH 115 APPLIED ALGEBRA & TRIGONOMETRY I.....5(4-2)

Normally Offered: F

Presents the mathematical topics most frequently encountered in technical work. Application of various functions of algebra, plane geometry and trigonometry are used. Emphasis is on the numerical approach rather than the analytical.

Prerequisite: MTH 090 or satisfactory math placement score.

MTH 116 APPLIED ALGEBRA & TRIGONOMETRY II.....5(4-2)

Normally Offered: SP

Covers advanced algebra, geometry and trigonometry. Applications of the various topics are made to different technical areas.

Prerequisite: MTH 115.

MATHEMATICS

MTH 117 MATHEMATICS FOR ELEMENTARY TEACHERS II3(3-0)

Normally Offered: SP

Covers algebra, coordinate geometry, functions, geometric construction, rotation and symmetry, mapping, statistics and experimentation. This course is designed for elementary education majors and use of computers in the elementary classroom will be emphasized.

Prerequisite: MTH 111 with a grade of 2.0 or higher.

MTH 119 INTRODUCTION TO COMPUTERS AND PROGRAMMING3(3-0)

Normally Offered: F, SP

This course introduces the student to a collection of contemporary computer applications, including operating system concepts, word processing, spreadsheets, and programming concepts. Computer terminology is introduced, however the major emphasis is placed upon computer usage and applications. Students should have some keyboarding skills.

MTH 121 COLLEGE ALGEBRA4(4-0)

Normally Offered: F, SP

Reviews previous mathematics, stressing modern approaches. Including topics related to business such as compound interest installment buying and annuities, matrices, linear algebra, linear programming and logarithms. May require some written interpretations of mathematical applications. For non-science majors.

Prerequisite: MTH 113 or equivalent with a grade of 2.0 or higher.

MTH 122 PLANE TRIGONOMETRY3(3-0)

Normally Offered: F, SP

Includes the study of trigonometric functions, identities, graphing, inverse trigonometric functions and sinusoidal functions. Exponential and trigonometric equations are solved. Oblique and right triangles are studied, as well as radian measure and complex numbers. This is a required course for students who plan to take advanced mathematics and lack a high school background in this subject.

Prerequisite: A grade of 2.0 or higher in MTH 113 or one-and-one-half years of high school algebra with a grade of 2.0 or higher.

MTH 123 COLLEGE ALGEBRA AND ANALYTIC TRIGONOMETRY4(4-0)

Normally Offered: F, SP

Covers sets, inequalities, functions, and inverse functions, real and complex number systems, introduction to coordinate geometry, trigonometric identities and functions, trigonometric equations, elementary theory of equations, progressions, mathematical induction, determinants, matrices, permutations, combinations and the binomial theorem. Offered for students who intend to enter the analytic geometry and calculus sequence, but who do not meet the necessary prerequisites.

Prerequisite: A grade of 2.0 or higher in MTH 113 and MTH 122, or one-and-one-half years of high school algebra and one semester of high school trigonometry with a grade of 2.0 or higher.

MTH 130 CALCULUS FOR BUSINESS/SOCIAL SCIENCES4(4-0)

Normally Offered: On Demand

This course continues the study of mathematical applications in Business and social sciences beyond the finite linear forms of MTH 121 College Algebra into a variety of non-linear forms. Functional analysis, differentiation, applications of derivatives, anti-differentiation, applications in integration, and functions of two variables are studied.

Prerequisite: MTH 121 or MTH 123 or instructor permission.

MTH 131 ANALYTIC GEOMETRY AND CALCULUS I5(5-0)

Normally Offered: F, SP

Covers rate of change of functions, limits, differentiation, and integration of algebraic and trigonometric functions and applications.

Prerequisite: MTH 123 or equivalent with a grade of 2.0 or higher.

MATHEMATICS

MTH 132 ANALYTIC GEOMETRY AND CALCULUS II5(5-0)

Normally Offered: SP

Includes transcendental functions, techniques of integration, analytic geometry, polar coordinates, parametric equations and infinite series.

Prerequisite: MTH 131 with a grade of 2.0 or higher.

MTH 221 C++ PROGRAMMING4(3-2)

Normally Offered: SP

This course is intended to satisfy the programming requirements for engineering and science students and is designed to teach the traditional concepts of programming such as integer, floating-point, and character data types, I/O, control structures, loops, functions, and arrays using the C++ programming language. It also teaches modern, object-oriented programming techniques using classes and data abstraction. Additional topics include dynamic array allocation, pointers, file manipulation, and inheritance. A brief introduction to MATLAB® software is included

Prerequisite: MTH 123 or above.

MTH 223 STATISTICAL METHODS4(4-0)

Normally Offered: F, SP

This course covers elementary statistics. Topics are: the nature of statistical methods, frequency distributions and graphs, measure of central tendency, dispersion, probability including conditional probability, the binomial, normal, T-, chi-square, and F-distributions, confidence intervals, hypothesis testing, linear regression modeling, and analysis of variance (ANOVA). Computer software will be used to reinforce student mathematical skills.

Prerequisite: MTH 113 or equivalent with a grade of 2.0 or higher.

MTH 231 ANALYTIC GEOMETRY AND CALCULUS III5(5-0)

Normally Offered: F

This course covers vectors, vector-valued functions and motion in space, linear algebra, partial differentiation, multiple integrals, and vector analysis.

Prerequisite: MTH 132 with a grade of 2.0 or higher.

MTH 232 DIFFERENTIAL EQUATIONS4(4-0)

Normally Offered: SP

This course includes differential equations of order one with applications, linear equations with constant coefficients (homogeneous and nonhomogeneous), variation of parameters, inverse differential operations, systems of linear equations, Laplace transforms with applications, nonlinear systems of differential equations, and an introduction to power series solutions. This is a required course for students majoring in engineering, mathematics, and physics.

Prerequisite: MTH 231 with a grade of 2.0 or higher.

MEDICAL ASSISTING

MED 221 MEDICAL ASSISTANT CLINICAL SEMINAR3(3-0)

Normally Offered: F

Students will be introduced to the clinical procedures for hands-on work in MED 222 and MED 223. Students will use software programs to practice and assess their ability to correctly perform clinical office procedures and soft skills. Must be in the Medical Assistant program

Prerequisite: BIS 220 with a grade of 2.0 or higher.

Co-requisite: MED 222, MED 223

MEDICAL ASSISTING

MED 222 MEDICATION ADMINISTRATION FOR MEDICAL ASSISTANTS.....5(4-2)

Normally Offered: F

Teaches the student how to measure and calculate drug dosages, techniques of medication administration, and the laws that specify the condition under which medical assistants may

administer drugs. Students will also learn how to administer intradermal, subcutaneous, and intramuscular injections. Must be in the Medical Assistant program.

Prerequisite: BIS 220 with a grade of 2.0 or higher. Placement in MTH 102 or completion of MTH 090.

Co-requisite: MED 221, MED 223

MED 223 MEDICAL ASSISTANT CLINICAL LAB4(2-4)

Normally Offered: F

Equips students with skills for the medical assistant to prepare patients and to assist the physician with routine physical exams in the office or clinic. Emphasizes patient preparation, accuracy in test performance, and safety in the laboratory according to current guidelines. Includes theory and procedures for microbiology, urinalysis, electrocardiography, and hematology. Must be in the Medical Assistant program.

Prerequisite: BIS 220 with a grade of 2.0 or higher. ACCUPLACER placement in MTH 102 or completion of MTH 090.

Co-requisite: MED 222.

MED 224 MEDICAL ASSISTANT CLINICAL PRACTICUM4(0-4)

Normally Offered: SP

Provides a practical educational/work experience in a selected physician's office or health care facility. The student is supervised and evaluated by qualified/licensed medical personnel. The student applies knowledge in performing clinical procedures and in developing professional attitudes for interacting with other professionals and consumers in the health field. Must be in the Medical Assistant program.

Prerequisite: MED 221, MED 222, MED 223 with a grade of 2.0 or higher.

Co-requisite: MED 225, MED 226.

MED 225 MEDICAL CONDITIONS AND PROCEDURES4(4-0)

Normally Offered: SP

Provides a basic review of anatomy and physiology followed by exploration of diseases, disorders, malformations, and injuries encountered in a medical office. Disease description, etiology, symptoms, diagnosis, treatment, and prevention will be covered.

MED 226 MEDICAL ASSISTANT CERTIFICATION TEST PREPARATION4(4-0)

Normally Offered: SP

Reviews topics encountered during both the administrative and clinical portions of the Medical Assistant program. Review will span the general, administrative, and clinical categories covered on the American Association of Medical Assistant test for the credential of CMA (AAMA) as set out in the AAMA Examination Content Outline.

Prerequisite: MED 221, MED 222, MED 223 with a grade of 2.0 or higher.

Co-requisite: MED 224, MED 225.

METALLURGY

MET 200 MATERIAL SCIENCE3(2-2)

Normally Offered: F

Introduction to the study of the science of engineering metals. Included in topics of study are atomic structure and bonding, properties and testing of materials. Methods of production and fabrication, methods of changing properties including heat treatment of metals, alloying and surface treatments. Introduces mechanical properties, phase diagrams, thermal processing, alloying, and corrosion. The common classification systems used to identify the various engineering materials are also covered. Laboratory exercises include heat treatment and destructive and non-destructive materials testing.

MUSIC

MUS 110 MUSIC APPRECIATION 3(3-0)

Normally Offered: F

Students will be exposed to many forms and periods of Western music, with emphasis on listening in order to follow the composer's musical ideas.

MUS 120 FUNDAMENTALS OF MUSIC 3(3-0)

Normally Offered: F, SP

Acquaints the student (both with and without a musical background) with the fundamental elements of music. Including, but not limited to: pitch, meter and rhythm, chords/harmony, notation, and ear training.

MUS 121 PIANO 2(0-2)

Normally Offered: F, SP

Gives individual instruction in the fundamentals of keyboard technique. Graded pieces comprise the repertoire that is chosen according to the student's proficiency. One-half hour lesson each week, by prior arrangement with instructor.

MUS 122 PIANO 2(0-2)

Normally Offered: F, SP

Continues instruction in the fundamentals of keyboard technique. Graded pieces comprise the repertoire that is chosen according to the student's proficiency. It is a continuation of MUS 121 and is comprised of a one-half hour lesson each week by prior arrangement with instructor.

Prerequisite: MUS 121.

MUS 123 VOICE I 2(0-2)

Normally Offered: F, SP

Student begins his/her study of voice with simple folk songs and easily-learned art songs. Subject matter includes: an attitude of enthusiasm, pleasure and confidence in singing, proper posture and diaphragmatic breathing, clear enunciation of pure vowel sounds and precise articulation of consonant sounds. A variety of styles are studied including: art songs and arias, texts in foreign languages and proper pronunciation of these texts.

MUS 124 VOICE II 2(0-2)

Normally Offered: F, SP

This course continues one-on-one instruction and builds upon concepts learned in MUS 123 Voice I. Students will add some foreign language songs in this course.

Prerequisite: MUS 123 Voice I for instructor permission.

MUS 125 MUSIC THEORY 4(4-0)

Normally Offered: F, SP

Studies the elements of musical notation, ear training and part-writing techniques. This is a fundamental course. Theory is recommended of all students who expect to continue in music after leaving Alpena Community College, whether majoring or minoring in music.

MUS 126 MUSIC THEORY 4(4-0)

Normally Offered: F, SP

Further studies the elements of musical notation, ear training and part-writing techniques. This is a continuation of MUS 125. Both semesters of Music Theory are recommended for all students who expect to continue in music after leaving Alpena Community College, whether majoring or minoring in music.

Prerequisite: MUS 125.

MUS 130 COMMUNITY CHORUS WITH THUNDER BAY ARTS COUNCIL 1(2-0)

Normally Offered: F

Partnership with Thunder Bay Arts Council community chorus will allow students to learn, prepare, and perform approximately fifteen choral arrangements. Chorus, study, and rehearsals include the basics of informed singing in a group setting such as proper breathing, pronunciation, maintenance of relative pitch, counting, blend, dynamics, and interpretation.

MUS 160 APPLIED FLUTE I2(0-2)

Normally Offered: F, SP

Applied Flute I will provide the student with private instruction in flute pedagogy and flute literature. Student must provide own flute, purchase method book and music.

MUS 161 APPLIED FLUTE II1(0-2)

Normally Offered: F, SP

Applied Flute II will provide students with private instruction in more advanced flute pedagogy and flute literature than provided in Applied Flute I.

Prerequisite: MUS 160.

MUS 221 PIANO2(0-2)

Normally Offered: F, SP

Gives individual instruction in the fundamentals of keyboard technique. Graded pieces comprise the repertoire which is chosen according to the student's proficiency. It is a continuation of MUS 122. It is comprised of a one-half hour lesson each week, by prior arrangement with instructor.

Prerequisite: MUS 121 and MUS 122.

MUS 222 PIANO2(0-2)

Normally Offered: F, SP

Gives individual instruction in the art of piano mastery. Graded pieces comprise the repertoire that is chosen according to the student's proficiency. It is a continuation of MUS 221. It is comprised of a one-half hour lesson each week by prior arrangement with instructor.

Prerequisite: MUS 221.

MUS 228 MUSIC IN THE ELEMENTARY CLASSROOM3(3-0)

Normally Offered: SP

Acquaints the prospective elementary school teacher with music fundamentals and musical activities used in the classroom. Students receive practical experience in teaching elementary songs and using various teaching aids such as piano, rhythm instruments, and autoharp.

MUS 229 MUSIC COMPOSITION2(2-0)

Normally Offered: On Demand

Studies the works of a variety of composers to understand how melodies are written and musical material is organized to form a unified piece. Students will complete their own composition using the Finale 2004 program.

Prerequisite: MUS 125.

NURSING

NUR 128 PHARMACOLOGY I1.5(1.5-0)

Normally Offered: F, SP

This course introduces the study of the effect of specific medications on body systems and ways to promote therapeutic effect and recognize and treat side effects or toxic effects.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203.

Co-requisite: NUR 140, NUR 140LC, NUR 142, NUR 143, NUR 152.

NUR 133 DOSAGE CALCULATIONS.....1.5(1.5-0)

Normally Offered: F, SP, SUM

This course introduces the concept of dimensional analysis as a means of solving nursing mathematics problems. Abbreviations, conversion factors, simple and advanced calculations will be covered. This is a prerequisite course for the Level I nursing program.

Co-requisite: ENG 111, CEM 111, BIO 140, BIO 201, BIO 203.

NURSING

NUR 135 PN TRANSITION TO PRACTICE..... 1(1-0)

Normally Offered: F, SP

This course presents opportunities to gain knowledge and skills necessary to transition from student to entry level practicing nurse. Content includes a discussion of current issues in health care, practical nursing leadership and management, professional practice issues, and transition into the workplace. Emphasis is placed on NCLEX-PN test-taking skills, computer-assisted practice tests, development of a plan for remediation, and review of selective content specific to the practice of entry level practical nursing.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, NUR 128, NUR 140, NUR 140LC,

NUR 142, NUR 143, NUR 152.

Co-requisite: NUR 150, NUR 151, NUR 153, NUR 155, NUR 156, NUR 157.

NUR 140 FOUNDATIONS OF NURSING..... 3(3-0)

Normally Offered: F, SP

This course is an introduction to nursing care stressing the importance of providing holistic care and valuing the culturally diverse clients that are experienced throughout the healthcare system. This course introduces nursing theory and expands on the practical nurse role with an emphasis on critical thinking. The principles and skills of nursing practice as applied to common physical and psychosocial manifestations of illness are taught. Additional topics include demonstrating professionalism by maintaining confidentiality, recognizing legal/ethical responsibilities, acting as a patient advocate, maintaining positive patient/colleague relationships, and implementing appropriate standards of care.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203.

Co-requisite: NUR 128, NUR 140LC, NUR 142, NUR 143, NUR 152.

NUR 140LC NURSING FOUNDATIONS LAB..... 1.5(0-4.5)

Normally Offered: F, SP

This course will provide students with basic nursing skills within the laboratory setting. Skills taught will enable students to function in a safe and professional manner in the role of the practical nurse.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203.

Co-requisite: NUR 128, NUR 140, NUR 142, NUR 143, NUR 152.

NUR 142 MEDICAL SURGICAL NURSING I..... 2.5(2.5-0)

Normally Offered: F, SP

This course continues to build on the practical nursing role in disease management and the continuum of care for the individual from early through late adulthood in various settings. The student identifies and describes nursing concepts that assist the patient in achieving optimal functioning for patients with medical/surgical problems.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203.

Co-requisite: NUR 128, NUR 140, NUR 140LC, NUR 143, NUR 152.

NUR 143 MEDICAL SURGICAL NURSING CLINICAL I 2(0-6)

Normally Offered: F, SP

The student will have the opportunity to provide direct patient care to the adult resident in the long term care (LTC) environment strengthening his/her understanding of the nursing process, nursing theory, patient care data collection and fundamental skills. Management of disease processes related to various body systems will be emphasized with the expectation of consistent use of the nursing process addressing the physiological, psychosocial and emotional needs of the client. Strategies that enhance critical thinking and problem solving skills are incorporated into the curriculum.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203.

Co-requisite: NUR 128, NUR 140, NUR 140LC, NUR 142, NUR 152.

NURSING

NUR 150 MEDICAL SURGICAL NURSING II 2.5(2.5-0)

Normally Offered: F, SP

This course continues to build on the practical nursing role in disease management and the continuum of care for the individual from early through late adulthood in various settings. The student identifies and describes nursing concepts that assist the patient in achieving optimal functioning for patients with medical/surgical problems.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, NUR 128, NUR 140, NUR 140LC, NUR 142, NUR 143, NUR 152.

Co-requisite: NUR 135, NUR 151, NUR 153, NUR 155, NUR 156, NUR 157.

NUR 151 MEDICAL SURGICAL NURSING CLINICAL II 2(0-6)

Normally Offered: F, SP

The student will be introduced to providing direct patient care to the adult population in the hospital environment. The student will be expected to function at the level of a basic team member in the practical nurse role, providing total patient care to a minimum of 3-4 patients.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, NUR 128, NUR 140, NUR 140LC, NUR 142, NUR 143, NUR 152.

Co-requisite: NUR 135, NUR 150, NUR 153, NUR 155, NUR 156, NUR 157.

NUR 152 OB/REPRODUCTIVE HEALTH/PEDS THEORY 2(2-0)

Normally Offered: F, SP

This course provides the theoretical background to prepare the Level I nursing student to care for women in all phases of the reproductive cycle and all aspects of newborn care in the delivery room and newborn nursery.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203.

Co-requisite: NUR 128, NUR 140, NUR 140LC, NUR 142, NUR 143.

NUR 153 OB/REPRODUCTIVE HEALTH/PEDS CLINICAL..... 1.5(0-4.5)

Normally Offered: F, SP

Building on the information learned in NUR 152 and 152LC, this course allows the student to participate in the application of the nursing process as it applies to the care of the childbearing and child rearing family. Clinical patient care assignments will focus on the normal process of pregnancy, labor and delivery and postpartum care. The needs of the expectant and new mother, newborn, and pediatric patient will be incorporated into clinical assignments. Students will be performing both physical and emotional assessments of their patients. Reproductive care across the lifespan will be observed, including factors influencing this process. Basic principles of human growth and development and care of the ill and hospitalized child will be addressed.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, NUR 128, NUR 140,

NUR 140LC, NUR 142, NUR 143, NUR 152.

Co-requisite: NUR 135, NUR 150, NUR 151, NUR 155, NUR 156, NUR 157.

NUR 155 NUTRITION IN HEALTH & ILLNESS2(2-0)

Normally Offered: F, SP

This course introduces the study of nutrition and the effect on the body systems. Principles of proper nutrition and the impact of illness will be discussed.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, NUR 128, NUR 140, NUR 140LC, NUR 142, NUR 143, NUR 152.

Co-requisite: NUR 135, NUR 150, NUR 151, NUR 153, NUR 156, NUR 157.

NUR 156 PHARMACOLOGY II 2.0(2-0)

Normally Offered: F, SP

This course continues the study of the effect of specific medications on the body systems and ways to promote therapeutic effect and recognize and treat side effects or toxic effects.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, NUR 128, NUR 140, NUR 140LC, NUR 142, NUR 143, NUR 152.

Co-requisite: NUR 135, NUR 150, NUR 151, NUR 153, NUR 155, NUR 157.

NURSING

NUR 157 MEDICAL SURGICAL NURSING CLINICAL III 1.5(0-4.5)

Normally Offered: F, SP

This course continues the practice of nursing care in the acute care clinical setting. Students will successfully manage a team of patients in the LPN role.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, NUR 128, NUR 140, NUR 140LC, NUR 142, NUR 143, NUR 152.

Co-requisite: NUR 135, NUR 150, NUR 151, NUR 153, NUR 155, NUR 156.

NUR 158 PHARMACOLOGY3(3-0)

Normally Offered: F, SP

This course involves the study of the effect of specific medications on the body systems and ways to promote therapeutic effects, recognize and treat side effects or toxic effects.

Prerequisite: CEM 111, ENG 111, BIO 201, NUR 133, BIO 203, NUR 140, NUR 140L, NUR 142, NUR 143.

Co-requisite: NUR 135, NUR 150, NUR 151, NUR 152, NUR 153, NUR 157.

NUR 234 HEALTH CARE THERAPIES I2(2-0)

Normally Offered: SP

Students will receive an education in a variety of complimentary care modalities for self and clients through creative movement, engaging activities, and purposeful discussion. This course focuses on exploration of self, progress toward self-realization, and self-enhancement to encourage the building of skills and awareness for holistic individual and client care.

NUR 235 HEALTH CARE THERAPIES II 2.5(2.5-0)

Normally Offered: F

Students will acquire an education on an array of complimentary care modalities for self and clients through creative movement, engaging activities, and purposeful discussion. This course spotlights the exploration of self, progress toward self-realization and self enhancement to inspire the building of skills and awareness of holistic individual and client care. Specific topics covered in this course include breath work, yoga, self-exploration, color therapy, massage, acupressure (Tapping), hypnosis, doshas, muscle memory, anxiety management, heart mapping, vibrations/frequencies, growth boards, mindfulness/sleep, and advancing knowledge of chakras.

NUR 236 HEALTH CARE THERAPIES III 2.5(2.5-0)

Normally Offered: SP

Students will gain an education on a range of complimentary care modalities for self and clients through creative movement, engaging activities, and purposeful discussion. This course targets the exploration of self, progress toward self-realization and self enhancement to support the building of skills and awareness of holistic individual and client care. Specific topics covered in this course include green living, astrology/natal chart, numerology, grounding, Tai Chi/Pilates, art therapy, geology/gemology, pranic healing, dance therapy, improving self-esteem, Feng Shui, and kinetics.

NUR 237 HEALTH CARE THERAPIES IV 2.5(2.5-0)

Normally Offered: F

Students will gain an education on a cross section of complimentary care modalities for self and clients through creative movement, engaging activities, and purposeful discussion. This course centers on the exploration of self, progress toward self-realization and self enhancement to strengthen the building of skills and awareness for holistic individual and client care. Specific topics covered in this course include acupuncture, archetypes, Bach flower remedies, past life regressions, shamanic journey, drum therapy, dream interpretation, angel cards/readings, auras, Zuni fetishes, persuasion, and religions of the world.

NUR 240 ADVANCED MEDICAL SURGICAL I THEORY 2(2-0)

Normally Offered: F, SP

This course provides the theoretical background to prepare the Level II nursing student to provide holistic care for adult patients with common acute and chronic medical/surgical problems.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, all Level I NUR courses.

Co-requisite: ENG 112, NUR 241, NUR 242, NUR 243, NUR 244, NUR 244LC.

NURSING

NUR 241 ADVANCED MEDICAL SURGICAL NURSING CLINICAL I 2(0-6)

Normally Offered: F, SP

This clinical course provides experiential learning opportunities that provide the fundamental skills of the registered nurse including basic team leading, physical and psychosocial assessment, and introduction to management and delegation. Emphasis will also be placed on interdisciplinary communication. These experiences will be obtained in both the acute care and a variety of ambulatory settings where the students will begin to provide collaborative and holistic nursing care to medical/surgical patients with complex health care needs.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, all Level I NUR courses.

Co-requisite: ENG 112, NUR 240, NUR 242, NUR 243, NUR 244, NUR 244LC.

NUR 242 ADVANCED PARENT/CHILD NURSING THEORY 2.5(2.5-0)

Normally Offered: F, SP

Building on information learned in NUR 152 and NUR 153, this course will provide the theoretical background to prepare the student to care for women in all phases of the reproductive cycle as well as children with health problems. The focus will be on health promotion and patient education. The concepts of growth and development will be discussed as they relate anticipatory guidance specific to age groups from infancy through adolescence.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, all Level I NUR courses.

Co-requisite: ENG 112, NUR 240, NUR 241, NUR 243, NUR 244, NUR 244LC.

NUR 243 ADVANCED PARENT/CHILD NURSING CLINICAL..... 1.5(0-4.5)

Normally Offered: F, SP

This course is a continuation of Advanced Parent/Child Nursing Theory in which challenging concepts of caring for women during labor, delivery, and the postpartum period as well as newborns in the delivery room and newborn nursery will be explored. Complex care of women admitted for conditions related to reproductive health will be included. Supplemental learning experiences will be offered through area agencies dealing with women's health and pediatric issues.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, all Level I NUR courses.

Co-requisite: ENG 112, NUR 240, NUR 241, NUR 242, NUR 244, NUR 244LC.

NUR 244 PHYSICAL ASSESSMENT..... 1(1-0)
Normally Offered: F, SP

This course is designed to teach the student a health oriented approach to nursing assessment of clients across the life span in a variety of settings. The primary focus of the course is on health assessment findings of every major body system, with recognition of abnormal findings. The course emphasizes development of the skills needed to perform a comprehensive health assessment. Data collection through comprehensive history taking and physical assessment is emphasized. Utilization of assessment findings in clinical decision making and application of the nursing process is focused on health promotion and disease prevention strategies.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, all Level I NUR courses.

Co-requisite: ENG 112, NUR 240, NUR 241, NUR 242, NUR 243, NUR 244LC.

NUR 244LC PHYSICAL ASSESSMENT LAB 1(0-3)
Normally Offered: F, SP

This course is designed to provide students the opportunity to learn and practice history taking and physical examination skills. The focus is on physical assessments findings of every major body system. Students will be able to utilize critical thinking skills in identifying health alterations, interpreting abnormalities, formulating nursing diagnoses, and documenting findings appropriate to nursing.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, all Level I NUR courses.

Co-requisite: ENG 112, NUR 240, NUR 241, NUR 242, NUR 243, NUR 244.

NURSING

NUR 249 ADVANCED MEDICAL SURGICAL NURSING THEORY II 2 (2-0)
Normally Offered: F, SP

This course is a continuation of NUR 240 which provides the theoretical background to prepare the Level II nursing students to provide holistic care for adult patients with common acute and chronic medical/surgical problems.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, all Level I NUR courses, ENG 112, NUR 240, NUR 241, NUR 242, NUR 243, NUR 244, NUR 244LC.

Co-requisite: PLS 221/222, NUR 249LC, NUR 250, NUR 252, NUR 252LC, NUR 253, NUR 255, NUR 257.

NUR 249LC ADVANCED MEDICAL SURGICAL NURSING II LAB5(0-1.5)
Normally Offered: F, SP

This course provides an opportunity to enhance nursing practice skills through managing nursing care of a group of hospitalized patients. Students will expand on the concepts of delegation, professionalism, evidence-based practice, patient-centered care, teamwork, safety, informatics and quality improvement. Providing care, managing care and functioning as a member of a health

care team will be the main focus to prepare the student for entry level Associate Degree Nursing practice.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, all Level I NUR courses, ENG 112, NUR 240, NUR 241, NUR 242, NUR 243, NUR 244, NUR 244LC.

Co-requisite: PLS 221/222, NUR 249, NUR 250, NUR 252, NUR 252LC, NUR 253, NUR 255, NUR 257.

NUR 250 ADVANCED MEDICAL SURGICAL NURSING CLINICAL II 1.5(0-4.5)

Normally Offered: F, SP

This course provides experiential learning experiences to prepare the Level II nursing student with knowledge of techniques used to perform culturally congruent health assessments on adult patients with acute and chronic medical/surgical problems. An emphasis will be placed on coordination of care. The acute care setting will be utilized to expand existing knowledge and skills as well as develop beginning skills as a team leader and provider of primary care.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, all Level I NUR courses, ENG 112, NUR 240, NUR 241, NUR 242, NUR 243, NUR 244, NUR 244LC.

Co-requisite: PLS 221/222, NUR 249, NUR 249LC, NUR 252, NUR 252LC, NUR 253, NUR 255, NUR 257.

NUR 252 PSYCHIATRIC NURSING THEORY 2(2-0)

Normally Offered: F, SP

This course provides the theoretical background to prepare the Level II nursing student to provide care for clients with acute and chronic psychiatric disorders, and chemical dependency problems.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, all Level I NUR courses, ENG 112, NUR 240, NUR 241, NUR 242, NUR 243, NUR 244, NUR 244LC.

Co-requisite: PLS 221/222, NUR 249, NUR 249LC, NUR 250, NUR 252LC, NUR 253, NUR 255, NUR 257.

NUR 252LC PSYCHIATRIC NURSING LAB 0.5(0-1.5)

Normally Offered: F, SP

This course provides an opportunity to reinforce concepts presented in NUR 252, Psychiatric Nursing Theory, and applied in NUR 253, Psychiatric Nursing Clinical. Students will assimilate practice concepts of professionalism, advocacy, therapeutic communication, safety, community resources, clinical presentations, and treatment options in preparation for practice as an Associate Degree prepared RN.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, all Level I NUR courses, ENG 112, NUR 240, NUR 241, NUR 242, NUR 243, NUR 244, NUR 244LC.

Co-requisite: PLS 221/222, NUR 249, NUR 249LC, NUR 250, NUR 252, NUR 253, NUR 255, NUR 257.

NURSING

NUR 253 PSYCHIATRIC NURSING CLINICAL 1.5 (0-4.5)

Normally Offered: F, SP

This is a clinical course with experience on an acute inpatient behavioral health unit, a residential drug and alcohol treatment program, and a community setting for the chronically mentally ill members. Level II nursing students assume aspects of the scope of practice of the Registered Nurse in Michigan by providing care to clients with acute and chronic behavioral health problems.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, all Level I NUR courses, ENG 112, NUR 240, NUR 241, NUR 242, NUR 243, NUR 244, NUR 244LC.

Co-requisite: PLS 221/222, NUR 249, NUR 249LC, NUR 250, NUR 252, NUR 252LC, NUR 255, NUR 257.

NUR 255 NURSING LEADERSHIP 1(1-0)

Normally Offered: F, SP

This course provides the basics of leadership and management techniques to enable students to provide care to groups of patients. Legal and ethical problems in nursing will be identified and investigated. It will also include the concepts of role transition from student to graduate nurse as well as job-seeking strategies for an entry level Registered Nurse position. Developing strategies for first-time success on the NCLEX-RN exam will be discussed /explored.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, all Level I NUR courses, ENG 112, NUR 240, NUR 241, NUR 242, NUR 243, NUR 244, NUR 244LC.

Co-requisite: PLS 221/222, NUR 249, NUR 249LC, NUR 250, NUR 252, NUR 252LC, NUR 253, NUR 257.

NUR 257 ADVANCED MEDICAL SURGICAL NURSING CLINICAL III 1.5(0-4.5)

Normally Offered: F, SP

Building on skills learned in Medical/Surgical I and II and incorporating material from NUR 240 and NUR 249, the focus of this clinical rotation will be on coordination of care, advanced physical and psychosocial assessment of patients, and team leading. During this rotation the student will spend time in the intensive care unit and the emergency department. By the end of this rotation the student will be expected to manage a full team of patients on a medical/surgical unit in the acute care setting.

Prerequisite: BIO 201, CEM 111, ENG 111, NUR 133, BIO 140, BIO 203, all Level I NUR courses, ENG 112, NUR 240, NUR 241, NUR 242, NUR 253, NUR 244, NUR 244LC.

Co-requisite: PLS 221/222, NUR 249, NUR 249LC, NUR 250, NUR 252, NUR 252LC, NUR 253, NUR 255.

PHYSICAL EDUCATION & HEALTH FITNESS

PEH 104 OPEN WATER DIVER 1(0.5-1)

Normally Offered: SUM

The course covers the basic principles and practices of scuba diving skills, including terminology, theory, and safety procedures. Class includes classroom/online materials and confined water activities. Upon satisfactory completion of course, students will have the option to complete their open water dives and obtain PADI certification.

Prerequisite: Successful completion of PADI swim test required for certification.

PEH 105 ADVANCED OPEN WATER DIVER 1(0.5-1)

Normally Offered: SUM

The Advanced Open Water Diver course provides the fundamentals to increase diving skills and knowledge with a strong focus on enhancing comfort in the water. The course builds on PEH 104 and develops new capabilities by introducing skills such as underwater navigation and deeper water diving (60-100 ft.), including the practical aspects and physiological effects of deeper scuba diving. Class includes classroom/online materials, pool session and open water dives. PADI certification upon satisfactory completion of course.

Prerequisite: PEH 104 or proof of equivalent certification and successful completion of PADI swim test required for certification. Instructor permission required.

PHYSICAL EDUCATION & HEALTH FITNESS

PEH 110 PERSONALIZED FITNESS I 2(0-3)

Normally Offered: F, SP, SUM

Provides development of basic exercise skills to increase and maintain levels of cardiovascular endurance, muscular strength, flexibility and body composition. Students will perform a personalized Tri Fit fitness profile and be responsible for documenting progress toward personal goals.

Prerequisite: Participants with physical restrictions or other medical health problems must have a written permission statement from their physician prior to active participation in this program.

PEH 112 PERSONALIZED FITNESS II2(0-3)
Normally Offered: F, SP, SUM

Includes advanced development of exercise skills to increase and maintain levels of cardiovascular endurance, muscular strength, flexibility and body composition. Provides a basic overview of nutrition guidelines that will enable students to perform a 3-day personal dieting analysis.

Prerequisite: PEH 110 and participants with physical restrictions or other medical health problems must have a written permission statement from their physician prior to active participation in this program.

PEH 181 YOGA FOR FITNESS I2(0-4)
Normally Offered: F, SP

This course incorporates powerful poses with relaxation poses. The sequential order allows for flowing movements designed to increase flexibility, strength and balance.

PEH 182 YOGA FOR FITNESS II2(0-4)
Normally Offered: SP

This course incorporates powerful poses with relaxation poses. The sequential order allows for flowing movements designed to increase flexibility, strength and balance. The poses will build on skills acquired in PEH 181 Yoga for Fitness I and, therefore, will be more advanced.

PEH 247 ADVANCED KARATE TANG SOO DO II2(0-4)
Normally Offered: F, SP

Continuation of the study and practice of Tang Soo Do Karate. Students may train and test for the next belt level in Tang Soo Do.

Prerequisite: PEH 162 or instructor permission.

PEH 263 WORKPLACE FIRST AID/CPR/AED1(1-0)
Normally Offered: F, SP

This course seeks to help participants identify and eliminate potentially hazardous conditions in their environment, recognize emergencies and make appropriate decisions for first aid care. It teaches the knowledge and skills that individuals in the workplace need to know to give immediate care to an ill or injured person until more advanced medical care arrives. Students who successfully complete this course according to American Red Cross standards will receive adult, child, and infant First Aid, CPR and AED certification.

PEH 264 COMMUNITY FIRST AID/CPR/AED (BLS).....1(1-0)
Normally Offered: F, SP, SU

This course seeks to help participants identify and eliminate potentially hazardous conditions in their environment, recognize emergencies and make appropriate decisions for first aid care. It teaches the knowledge and skills that individuals in the community need to know to give immediate care to an ill or injured person until more advanced medical care arrives. Students who successfully complete this course according to American Heart Association standards will receive adult, child, and infant First Aid, CPR and AED certification. There is a separate course fee for this course.

PREFORMING ARTS

PFA 101 INTRODUCTION TO DANCE.....3(3-0)

Normally Offered: On Demand

This course will introduce the student to the basic components in ballet and jazz techniques.

PREFORMING ARTS

PFA 102 DANCE II.....3(3-0)

Normally Offered: On Demand

Continues the curriculum in dance principles in creative and contemporary movement, ballet basics and jazz techniques from Dance I.

Prerequisite: PFA 101 or instructor permission.

PFA 108 ACTING I.....3(3-0)

Normally Offered: F, SP

Acting I will focus on improvisation, creative dramatics and basic acting skills.

PFA 110 ACTING II.....3(3-0)

Normally Offered: F, SP

Acting II continues to develop improvisational and creative dramatic skills for more complex performance situations. In addition, Acting II will introduce students to scene study utilizing Stanislavski techniques for performance of scripted material.

Prerequisite: PFA 108.

PFA 203 DANCE III.....3(3-0)

Normally Offered: On Demand

This course is geared for the student of dance who has a background in dance and would like to continue their education in ballet and jazz techniques. An introduction to choreography will also be covered.

Prerequisite: PFA 102 or instructor permission.

PFA 204 DANCE IV.....3(3-0)

Normally Offered: On Demand

This course is designed for the student of dance who has had extensive experience in the field before attending college. Jazz, ballet and modern technique will be covered along with an introduction to the art of choreography. This is meant to be a continuation of Dance III.

Prerequisite: PFA 203 or instructor permission.

PFA 211 ACTING III.....3(3-0)

Normally Offered: F, SP

Acting III will focus on developing audition techniques, script analysis and advanced character analysis utilizing the Stanislavski technique.

Prerequisite: PFA 110.

PFA 212 ACTING IV.....3(3-0)

Normally Offered: F, SP

Acting IV will focus on advanced performance activity and character analysis and development utilizing the Stanislavski point of view. Acting IV will concentrate on preparing students for continued studies in theatre at the university level.

Prerequisite: PFA 211.

PHILOSOPHY

PHL 125 LANGUAGE AND REASON3(3-0)

Normally Offered: F, SP

Develops the student's problem solving and thinking skills and enhances the student's understanding of the relationship between language and thinking. Topics covered include, but are not limited to, critical thinking, verbal reasoning, analogical thinking, pattern recognition, mathematical thinking, etc. Emphasis is on the development of specific skills that are necessary for the student to effectively read and process information in a critical way.

PHILOSOPHY

PHL 225 PHILOSOPHY.....3(3-0)

Normally Offered: F, SP, SU

Surveys some of the main problems of philosophy and the ideas of great thinkers from ancient times to the present.

Prerequisite: Sophomore standing or consent of instructor.

PHL 228 INTRODUCTION TO ETHICS3(3-0)

Normally Offered: F, SP, SU

Introduces the student to both a variety of classical ethical theories as well as to the application of these theories to a number of contemporary moral issues. Areas of focus include bio- and business ethics, environmental ethics, crime and punishment issues, and political and economic ethical issues, etc. The principal aim of the course is to help students become more knowledgeable about ethical theories and issues as well as to help them develop practical methods for reaching critically defensible positions on the moral questions that affect their lives.

Prerequisite: ENG 111 or ENG 121 with a grade of 2.0 or higher, or permission of instructor.

PHYSICAL SCIENCE

PHS 113 INTRODUCTION TO PHYSICAL SCIENCE4(3-2)

Normally Offered: F, SP

Develops fundamental concepts in mass, energy, space and time through use of selected material from the areas of physics, chemistry, astronomy and earth science. Attention is given to methods and the process of scientific investigation. May be elected by those not majoring in science to meet science requirements.

Prerequisite: MTH 102 with a grade of 2.0 or higher, or consent of instructor.

PHYSICS

PHY 111 APPLIED PHYSICS3(2-2)

Normally Offered: F, SP

Includes classical mechanics, simple machines, power transmission, structure and properties of matter, thermodynamics and heat. The emphasis is placed upon practical, technical and industrial aspects of physics rather than upon philosophical and theoretical considerations. Designed specifically to furnish a sound scientific background for students majoring in certain technical fields.

Prerequisite: Elementary algebra and preferably high school physics. Technical students having two years of algebra with trigonometry are encouraged to enroll in PHY 121-122 as a substitute for PHY 111-112.

PHY 121 GENERAL COLLEGE PHYSICS.....4(4-2)

Normally Offered: F

Meets the needs of liberal arts students, especially those on pre-medical, pre-dental, pre-law, general science and secondary education programs. This course also meets the needs of technical students who satisfy the prerequisites. Topics covered include classical mechanics, heat, thermodynamics, wave motion, and sound.

Prerequisite: One and one-half years of high school algebra with one-half year of trigonometry or the equivalent college mathematics courses. Students having one semester of calculus sequence are encouraged to enroll in PHY 221 in place of PHY 121.

PHY 122 GENERAL COLLEGE PHYSICS.....4(4-2)

Normally Offered: SP

Continues PHY 121. Topics included are electricity and magnetism, light and optics, special relativity, and some other aspects of modern physics.

Prerequisite: PHY 121.

PHYSICS

PHY 123 INTRODUCTION TO ASTRONOMY3(3-0)

Normally Offered: F

Includes historical introduction, methods of astronomy, the solar system, the sun, stars, stellar systems, galaxies and some current topics in cosmology. Designed for liberal arts students. Although no prerequisites are required, simple algebra and geometry are used and a general science background is desired.

PHY 124 INTRODUCTION TO PHYSICAL GEOLOGY.....4(3-0-2)

Normally Offered: SP

Lecture, discussion, labs, and field trips will be used to study the processes that shape our world. Topics include: minerals, rocks, volcanism, earthquakes, continental drift, erosion and deposition, the ice age, and the economic significance of geology to humankind.

PHY 221 PHYSICS5(3-2-2)

Normally Offered: F

Includes topics in classical mechanics, heat, thermodynamics, wave motion, and sound. The class is designed primarily for students majoring in chemistry, engineering, mathematics, or physics; but other students who desire a rigorous course in physics and who satisfy the prerequisites are encouraged to enroll in this course. The course consists of three lecture hours per week along with two one-hour problem-solving sessions and one double period laboratory session.

Prerequisite: High school physics and MTH 131 or its equivalent.

PHY 222 PHYSICS5(3-2-2)

Normally Offered: SP

Continues Physics 221. Includes electricity, magnetism, light and optics, and some special topics of modern physics. The course consists of three hours of lecture per week along with one double period problem session and one double period laboratory session.

Prerequisite: PHY 221 or consent of instructor.

POLITICAL SCIENCE

PLS 221 AMERICAN GOVERNMENT AND POLITICS3(3-0)

Normally Offered: F, SP, SUM

Introduces U.S. politics and government at the national level while providing local, state and international context. Fosters breadth of understanding and appreciation for the structure of the political process and the responsibilities of citizenship for students with broad academic and professional interests. Emphasis is placed on the nature of representative democracy, political philosophies, the U.S. Constitution and its historical evolution, federalism, and practical politics, including political behavior, political parties and interest groups.

PLS 222 STATE AND LOCAL GOVERNMENT 3(3-0)

Normally Offered: F

Studies politics, government and civic engagement at the state and local level with comparative perspective from a variety of states within the United States. Considerable attention is afforded the formal institutions of government at the state level as well as county, township, city, and village government and the challenges facing each level of government within the federal system of the United States. Special attention is given to practical application of individual involvement in civic engagement at the local level as it applies to the student's role and their professional pursuits in a participatory social and political system.

PLS 228 INTERNATIONAL RELATIONS 3(3-0)

Normally Offered: F

Provides a broad and comprehensive survey of the historical, social, cultural, economic and political characteristics of modern international political systems and relations among nation-states throughout the world, including such organizations as the United Nations and NATO and regions such as the Middle East, Africa, the Indian sub-continent, Asia, Europe and the Americas, placing the United States within a larger international context. Considers relations among nations from a regional perspective and the larger trends in contemporary global politics.

POLITICAL SCIENCE

PLS 230 COMPARATIVE GOVERNMENT 3(3-0)

Normally Offered: SP

Studies governmental structures, practices and ideological foundations of democratic and non-democratic countries, inclusive of Britain, France, Germany, China and Iran, in comparison with one another and the United States. Consideration is given to the scientific methodology of comparative study of politics, nation-states and their development, state institutions (parliamentary versus presidential systems), democracy, political ideologies, electoral systems, political parties, interest groups, political culture and political economy.

PSYCHOLOGY

PSY 101 GENERAL PSYCHOLOGY..... 3(3-0)

Normally Offered: F, SP, SUM

Presents the basic subjects of the field of psychology from the scientific study of behavior and mind of humans and animals. Subjects include, but are not limited to, biology of behavior, learning, memory and cognition, human development and emotions, health, abnormal behavior and therapy, and social interaction.

PSY 226 DEVELOPMENTAL PSYCHOLOGY 3(3-0)

Normally Offered: F, SP, SUM

This course covers the physiological development of humans from conception through old age. The course includes social, emotional and cognitive development, relations with parents, peers and others, and problems related to school, work and society.

Prerequisite: PSY 101, ENG 111 or permission of instructor.

PSY 230 HUMAN SEXUALITY 3(3-0)

Normally Offered: F, SP

This course will cover the biological, psychological and socio-cultural aspects of human sexuality.

Prerequisite: PSY 101 and ENG 111 or instructor permission.

PSY 241 SOCIAL PSYCHOLOGY..... 3(3-0)

Normally Offered: F, SP

This course begins with a discussion surrounding the methods used to study social psychology. Then, we will look at how we view ourselves and others by examining the accuracy of our

impressions, institutions, and explanations. In part three, we will explore the cultural sources of our attitudes to better recognize the social forces at work upon us. Finally, part four focuses on social relations. Our discussions will be directed at subjects such as prejudice, aggressions, attraction, altruism, conflict, and peacemaking.

Prerequisite: PSY 101 and ENG 111 or instructor permission.

PSY 242 ABNORMAL PSYCHOLOGY3(3-0)

Normally Offered: F, SP

This course will familiarize students with the history of how people have reacted to abnormal behavior in others, biological and psychosocial theories about the origins and dynamics of mental illness and abnormal behavior, classification and assessment of disorders and therapeutic methods to treat these disorders.

Prerequisite: PSY 101 and ENG 111 or instructor permission.

SOCIOLOGY

SOC 123 INTRODUCTION TO SOCIOLOGY3(3-0)

Normally Offered: F, SP, SUM

This introduction to sociology offers students foundational understandings of central sociological approaches, including terminology, theory, and methods that sociologists use to understand life worlds, social order, social conflict, and social change. Students will learn how sociologists examine social arrangements to shape human experience and how people create order and conflict.

Prerequisite: Eligibility for ENG 111.

SOCIOLOGY

SOC 140 INTRODUCTION TO SOCIAL WORK.....4(4-0)

Normally Offered: SP (odd years)

This is an exploratory course that introduces students to the profession and practice of social work and examines the history, principles, functions, and knowledge base of social work. Students are required to do 35-40 hours of volunteer work at human service agencies in addition to scheduled class sessions.

Co-requisite or Prerequisite: SOC 123.

SOC 210 SOCIAL INEQUALITY: RACE, CLASS, AND GENDER3(3-0)

Normally Offered: Fall (even years), SP

Race, ethnicity, class, and gender have all been, and continue to be, significant areas of social difference and discrimination in American society. This course will examine contemporary social conditions as they relate to race, ethnicity, class, and gender. The course will also address the ways in which these three elements are interconnected and how the interconnection of these three elements serves to further complicate social difference in America.

Prerequisite: SOC 123 or instructor permission.

SOC 227 SOCIOLOGY OF MARRIAGE AND THE FAMILY3(3-0)

Normally Offered: SP (odd years)

This course will involve an analysis of the social construction and social experience of marriage and the family as institutions. The course will explore the concepts of marriage and the family as important cornerstones that structure social interactions at various levels, and especially relations of power and inequality in society.

Prerequisite: SOC 123.

SOC 252 GREAT BOOKS ON LEADERSHIP3(3-0)

Normally Offered: SP

Helps prepare students to assume increasingly responsible leadership roles in their personal, professional, community and academic lives. Focus on significant theories of leadership and fellowship; includes experiential learning opportunities in which the students will practice leadership in action. Readings based in the great books of western civilization series provide a broad cultural perspective. This course satisfies associate degree general education requirements for either Group III Social Science or Group IV Humanities, but may not be used for both.

SPEECH

SPE 121 SPEECH COMMUNICATION.....3(3-0)

Normally Offered: F, SP, SUM

Presents communication fundamentals with emphasis on oral communication. Topics include origin of language, semantics, interpersonal and intrapersonal communication, etc. Students discuss materials and participate in informal and formal speech activities.

SPE 123 PUBLIC COMMUNICATION3(3-0)

Normally Offered: F, SP

A course in public communication including practical experience and theoretical study of small group discussions and the public speech.

SPE 126 ORAL INTERPRETATION OF LITERATURE3(3-0)

Normally Offered: On Demand

An introduction to the analysis, interpretation, rehearsal and oral performance of literature. Students work with selections of prose, poetry and drama written for adults and children.

SPANISH

SPN 117 CONVERSATIONAL SPANISH.....1(1-0)

Normally Offered: On Demand

An introductory, exploratory course for prospective travelers or those who are considering enrolling in a full language study course.

SPANISH

SPN 125 SPANISH.....4(4-0)

Normally Offered: F, SP

Promotes grammatical, cultural and geographic appreciation of the Spanish language and the people who speak it. This introductory course will begin to develop the student's fluency in listening to, speaking, reading and writing Spanish.

SPN 126 SPANISH.....4(4-0)

Normally Offered: F

Continues SPN 125. Promotes grammatical, cultural and geographic appreciation of the Spanish language and the people who speak it. This course will continue developing the student's fluency in listening to, speaking, reading and writing Spanish.

Prerequisite: SPN 125 or instructor's permission.

STUDENT DEVELOPMENT EDUCATION

SDE 101 INTRODUCTION TO CAREERS.....1(1-0)

Normally Offered: F, SP, SUM

This class provides multiple opportunities for students to enhance their self-awareness in relation to the world of work. Various careers are explored through the use of videotapes, inventories and campus resources. Life-long decision-making skills are emphasized and applied to personal goals and values.

SDE 201 JOB SEARCH STRATEGIES..... 1(1-0)
Normally Offered: F, SP

Students learn how to create a professional resume, cover letter and job search strategies as well as interviewing techniques; also, they learn how to use Internet sites to find jobs in their field of study and post resumes electronically. Students complete a job search portfolio containing documents required for an effective job search and interview. A variety of course activities promote students' understanding of the competitive job market and how to effectively present their "best self" to prospective employers.

UTILITY TECHNICIAN

UTT 101 INTRODUCTION TO THE UTILITY INDUSTRY 5(.5-0)
Normally Offered: F

Orients student to the importance of and opportunities in the utility industry.

UTT 102 CLIMBING ELEVATED WORK SITES..... 1(1-0)
Normally Offered: F

Provides practical experience in working in an elevated work site. Climbing and bucket truck operation will be stressed.

UTT 103 OVERHEAD CONSTRUCTION 1(1-0)
Normally Offered: F

Proper overhead construction techniques will be demonstrated and practiced. Topics will include tool selection, pole selection and setting, rigging, safety procedures, maintenance techniques, and vehicle trailer operations.

Co-requisite: UTT 102.

UTT 110 LINE MECHANIC LAB I 6(1.5-9)
Normally Offered: F

Orient students, in an outdoor lab setting, to proper and safe climbing techniques and the use of aerial lift devices. Students will construct overhead and underground primary and secondary electrical systems. Safe equipment operation will be stressed.

Co-requisite: UTT 102, UTT 103, UTT 203.

UTILITY TECHNICIAN

UTT 111 LINEMAN PHYSICAL FITNESS I 2(1-2)
Normally Offered: F

Designed for the Utility Technician student to improve fitness levels to meet the demands of lineworker training and unique job requirements. Course focuses on injury prevention, flexibility, endurance, and strength. Course will include individual and group workout activities.

Prerequisite: UTT student or instructor permission.

Co-requisite: UTT 110 or instructor permission.

UTT 202 TRANSFORMER FUNDAMENTALS..... 2(1-2)
Normally Offered: SP

Orients student to the operation of and types of transformers used by the utility industry. Selection of proper transformer for a given application and maintenance of transformers will be stressed.

Co-requisite: UTT 201.

UTT 203 UNDERGROUND CONSTRUCTION 2(2-0)
Normally Offered: F

Introductory course in underground utility construction and equipment operation. Includes hands-on experience in cable laying, splicing and terminations of both primary and secondary cable.

UTT 204 SYSTEM DESIGN AND OPERATION4(4-0)

Normally Offered: SP

Orients student to the design and operation of an electrical utility system from point of generation, transmission, distribution, to end user.

Co-requisite: UTT 201, UTT 202.

UTT 206 EQUIPMENT/VEHICLE OPERATION2(1-2)

Normally Offered: SP

Orients student to equipment and vehicles common to the utility industry.

UTT 208 CLIMBING & WORKING IN ELEVATED WORK SITES2(2-0)

Normally Offered: SP

Classroom study of climbing and elevated work platforms used in the utility industry to perform construction and maintenance. Topics include dead line and live line techniques as well as safety instruction.

Prerequisite: Student must be a qualified climber.

Co-requisite: UTT 210.

UTT 210 UTILITY LINE/MECHANIC LAB5(1-8)

Normally Offered: SP

Orient students, in an outdoor lab setting, to the proper and safe construction and maintenance of overhead and underground electric systems. To include test and diagnostic equipment as well as transformer function, installation, selection and troubleshooting of single phase and three-phase power banks.

Prerequisite: First semester of Utility Technology program.

Co-requisite: UTT 201, UTT 202, and UTT 208.

UTT 211 LINeworker PHYSICAL FITNESS II2(1-2)

Normally Offered: SP

Advanced lineworker fitness course concentrating on stamina, strength, and mental toughness required to complete a lineworker apprentice program and be successful as a career lineworker. Course includes individual and group workout activities.

Prerequisite: UTT 110 or instructor permission.

Co-requisite: UTT 210 or instructor permission.

UTILITY TECHNICIAN

UTT 221 LINE WORKER ORIENTATION 1.5(1-1)

Normally Offered: During Christmas Break or Summer Semester

The purpose of this class is to give prospective lineman apprentice candidates a good demonstration of the work they will be required to do as an apprentice and journeyman line worker. Students will be given an introduction to the physical aspects and mental disciplines required to perform the duties of a line worker with demonstrations and physical tests.

Prerequisite: College reading level.

UTT 222 ELECTRIC BASIC LINE CLIMBING4(2-4)

Normally Offered: SU

This course is designed to provide students with the basic knowledge and pole climbing skills necessary to successfully progress through the Electric Line Apprentice Program.

Prerequisite: Must have successfully completed UTT Basic Certificate Program.

UTT 223 GROUND/UTILITY WORKER5(2-6)

Normally Offered: SU

This course is designed to provide students with the basic Ground/Utility Worker knowledge and skills necessary to progress through the Electric Line Apprentice Program.

Prerequisite: Must have successfully completed UTT Basic Certification Program.

UTT 224 ENERGIZED SECONDARY WORKER.....5(2-6)

Normally Offered: SU

This course addresses the knowledge and skills necessary to progress through the Utility Technician Advanced Certificate program with a focus on the installation and maintenance of secondary lines of 120/240 Volts. Safe work practices on energized conductors and aerial lifts, digger derricks, and associated equipment are developed and required. This course is normally offered during the summer semester and the Consumers Energy training facility in Marshall, Michigan.

Prerequisite: Must have successfully completed UTT Basic Certification program.

UTT 300 WORKING WITH UTILITY SYSTEMS.....6(5-2)

Normally Offered: SP

Provides an orientation to, and hands on operation of, test and troubleshooting equipment used in the utility industry. Orients student to the operation of and types of transformers used by the utility industry. Selection of proper transformer for a given application and maintenance of transformers will be stressed. Orients student to the design and operation of an electrical utility system from point of generation, transmission, and distribution, to end user.

Co-requisite: APP 100E.

WELDING

WLD 123 SMAW WELDING PROCESSES4(2-4)

Normally Offered: F

This course covers basic Shielded Metal Arc Welding using E6010 and E701 electrodes, used in all positions. Welding safety, oxyacetylene and plasma cutting, equipment set-up, electrodes, joint design, and welding theory will be discussed.

WLD 124 CMAW AND FCAW WELDING PROCESSES.....4(2-4)

Normally Offered: F, SP

Gives the student experience in Gas Metal Arc Welding (GMAW), Flux Cored Arc Welding (FCAW) and out-of-position shielded metal arc welding. Welding equipment setup, welding theory and processes, nonferrous metals, testing and inspection, welding design, welding blueprints, and general welding shop equipment will be studied.

WELDING

WLD 134 INTRODUCTION TO WELDING TECHNIQUES2(1-2)

Normally Offered: F, SP

This course provides students with an introductory course in basic SMAW welding techniques, equipment set-up, safety, and applications.

WLD 135 INTERMEDIATE WELDING.....1.5(.75-1.5)

Normally Offered: F, SP

This course provides students with an intermediate level of SMAW welding techniques, equipment set-up, safety, and applications.

Prerequisite: WLD 134.

WLD 138 AMERICAN WELDING SOCIETY LEVEL I4(2-4)

Normally Offered: F, SP

This course will cover intermediate welding practices which will prepare students for the American Welding Society Level I entry level welding certification requirements. Welding will be performed in the flat, horizontal, vertical, and overhead positions. This is an additional course to provide the student with more time to finish the Level I assignments that have not been completed in prior coursework.

Prerequisite: WLD 123, WLD 124, or instructor permission.

WLD 238 AMERICAN WELDING SOCIETY LEVEL II4(2-4)

Normally Offered: F, SP

This course will cover advanced pipe welding practices which will prepare students for the American Welding Society Level II advanced welding certification requirements. Welding will be performed on pipe in the 2G, 5G, and 6G positions. This is an additional course to provide the student with more time to finish the Level II assignments that have not been completed in prior coursework.

Prerequisite: WLD 123, WLD 124, or instructor permission.

WLD 240 GAS TUNGSTEN ARC AND PIPE WELDING.....4(2-4)

Normally Offered: F, SP

Students will develop the skills, principles, and application of gas tungsten arc welding. Welds will be done on different thicknesses of ferrous and non-ferrous metals in all positions. Proper material cleaning, joint fit-up, and safety are also introduced. Base pipe welding practices will also be introduced in this course.

WLD 242 WELDING FABRICATION3(1-4)

Normally Offered: SP

This course covers sheet metal, structural steel, AWS structural D1.1 welding code practices and weldments, CNC plasma cutting and layout, material processing, WPS development, creating a bill of materials, and fabrication to print specifications. Students will be required to complete a capstone fabrication project.

Prerequisite: WLD 123 or WLD 124 and MFG 120 or instructor permission.

WLD 250 ADVANCED PIPE WELDING5(2-6)

Normally Offered: F

This course is designed to train the student in advanced pipe and tube welding procedures, using various welding processes. Students will learn to weld carbon steel, aluminum and stainless steel pipe and tubing in the 2G, 5G, and 6G positions. Strong emphasis will be placed on proper joint preparation and adherence to the applicable AWS, ASME, and API welding code standards.

Prerequisite: WLD 240 or instructor permission.

WELDING

WLD 252 SPECIALTY WELDING AND TESTING PROCEDURES5(2-6)

Normally Offered: SP

This course is designed to train welders in the weldability of less common metals and the proper equipment and electrode selection, machine set-up, and base metal preparation required to make a high quality weld. Students will be taught the basic Destructive (DT) and Nondestructive (NDT) weld control testing procedures for checking discontinuities and defects that could affect weld integrity, appearance, and strength. Strong emphasis will be placed on confirming weld quality and adherence to all applicable AWS, ASME, and API welding code standards.

Prerequisite: WLD 124 or instructor permission.

WLD 260 WELDING AUTOMATION3(2-2)

Normally Offered: SP

This is an introductory course designed to train the student in the basic operation and programming of a robotic welding cell. Emphasis will be placed on safety, justification, fixturing, set-up, programming, and troubleshooting. Laboratory will include the set-up and operation of basic automatic welding systems with a study of the effects of welding parameters on weld outcomes.

Prerequisite: WLD 124 or instructor permission.