COURSE LISTING DEFINITIONS ARE AS FOLLOWS:

**Course Number and Title:** Designates the course discipline, number and title. Courses numbered 000-099 are designated to serve purposes at other than normal freshman or sophomore levels. Such courses normally will not transfer or satisfy graduation requirements. Courses numbered 100-199 are primarily introductory in scope and are normally, although not necessarily, taken during the freshman year. Courses numbered 200 and above are designed for the more advanced student and are usually elected during the sophomore year.

**Credit Hours:** The number of credits a course is assigned toward graduation.

**Lecture-Laboratory Hours:** The first number in parentheses refers to the hours the student will spend per week in the classroom, in a lecture setting. The second number refers to the instructional hours that a student will spend in a laboratory. The addition of these two figures will produce the total number of contact hours the student will spend per week in class.

**Course Description:** An explanation of the knowledge and skills gained by successful completion of the course.

**Prerequisite:** Requirements which must be met or courses which must be taken before enrolling in a specific course.

**Corequisite:** Courses which must be taken at the same time as the desired course unless previously completed.
ACC 252 Tax Accounting II 3(3-0)
The emphasis in this course is placed on current tax law provisions. Topics include corporations, partnerships, and estates and trusts, as well as more complex individual tax returns.
Prerequisite: ACC 251

ACC 261 Computerized Accounting 3(3-1.5)
An introduction to the use of computers in accounting, this course covers computerized business accounting systems including computerized payroll systems. In addition, there will be utilization of spreadsheets. In addition to classroom work, each student is required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisites: CIS 130, ACC 211

ACC 280 Co-op (Accounting) 3(1-10)
Co-op is a capstone course planned for the last semester of the Associate in Business: Accounting Degree. The students will be employed in an approved co-op position selected by the college coordinator and will also attend a weekly one hour classroom lecture/discussion. A waiver may be allowed for the work component only with equivalent previous/present work experience as determined by the coordinator. An individual evaluation is made by the coordinator only upon student request. Documentation by the employer will be required.
Prerequisite: The student must have completed at least 45 credit hours in the Associate in Business: Accounting Degree.

ACC 290-299 Selected Topics 1-3(1 to 3-0)
These courses are designed to investigate various topics in Accounting not included in current courses. Topics will be announced.

ALH 100 Medical Terminology 2(2-0)
This course is an introduction to medical terminology. Emphasis is placed on the meaning, pronunciation, spelling, and application of common medical terms, abbreviations, prefixes, stems, suffixes, etc., as related to the human body – tissues, organs, systems, etc.

ALH 107 Competency Evaluated Nurse Aide 6(3-8)
This course is designed to prepare the individual to fulfill the role of direct care giver/nurse aide in a health care setting. The course introduces scientific principles and skills which will optimize the client’s functional independence and support and promote their individual rights. This course includes classroom activities, skill practice time in the laboratory, and supervised clinical practice at an area health care agency. Upon completion of the course, the student will be eligible to take the clinical and written exams required for Competency Evaluated Nurse Aide (CENA).

ALH 112 Insurance Billing 3(3-1.5)
This course deals with the insurance and billing processes needed to deal with the major health carriers. Students will learn how to process a variety of claim forms and will learn proper billing, recordkeeping, and collection procedures. In addition to the classroom work, each student is required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisite: ALH 100

ALH 115 Pharmacology for Registered Health Information Technologist 3(3-0)
This course is intended to familiarize the student with a variety of pharmacological agents and new drugs. This course will allow the student to identify the medicinal interaction and effects of certain drugs in relation to treatment of specific diseases and/or disorders.
Prerequisites: ALH 112, ALH 150, BIO 120
Corequisites: ALH 200, ALH 215

ALH 125 Introduction to the Health Care Environment 3(2-2)
This course is designed to introduce the allied health student to health care today, health care systems, functions and trends, ethical and legal responsibilities in health care, workplace safety, handling hazardous materials, reporting hazardous activities, emergency preparedness, ergonomics, infection control, controlling health care costs, historical background, interpersonal-relationships, future roles, and successful employment strategies. The course will be laboratory based and cover a common core of clinical skills used by health care providers. The student will be introduced to health care professional organizations. The course provides the student with the foundation upon which other courses build and expand.
Prerequisites: ALH 100

(ALH) ALLIED HEALTH
ALH 150 Introduction to Healthcare Information Systems   4(4-0)
The intent of this course is to familiarize the student with the policies and procedures in the health care field. To teach students how particular policies and procedures are ensured; especially in regards to time lines, completeness, accuracy and appropriateness of patient care; management, billing, reports, registries and/or data bases. The student will also learn the current laws, accreditations, licensure and certification standards.
Prerequisite: ALH 100, BIS 140 and Admission to the RHIT or Medical Coding/Billing programs
Corequisite: ALH 112

ALH 200 ICD-9-CM   4   (2-4)
The goal of this course is to develop an understanding of coding and classification systems in order to assign valid diagnostic or procedure codes.
Prerequisites: ALH 112, ALH 150, BIO 120
Corequisites: ALH 115, ALH 200

ALH 205 Health Data Content, Requirements & Standards   3(3-0)
This course is to familiarize the student collecting and maintaining health data. It is designed to teach students how to manage, analyze, and utilize data that is vital for enhancing patient care. The student will also learn how the content and relevancy of the health record assists in patient care.
Prerequisites: ALH 115, ALH 200, ALH 215, ALH 220, BUS 241
Corequisites: ALH 225

ALH 212 Clinical Procedures I   3(2-2)
This class is an introduction to common procedures performed in the medical office setting for the Medical Assistant. A course designed with emphasis on safe, accurate administration of medications. Through use of the text, the students will acquire knowledge of drug actions, major side effects, and techniques of administration as well as gain basic skills necessary to assist the physician in the examination of, diagnosis and treatment of patients in the office setting.
Prerequisite: Admission to the Medical Assistant Program
Corequisite: ALH 213

ALH 213 Pharmacology for Medical Assistants   3(3-0)
Competency-based objectives to guide Medical Assistant students in their study of each unit in the Pharmacology text. This class stresses the six rights of drug administration, including drug administration procedures that include standard precautions, purpose, equipment/supplies, and procedure steps to administering medications. Emphasis is placed on the legal implications of drug therapy, safety, and accuracy in calculating and administering medications.
Prerequisite: Admission to the Medical Assistant Program
Corequisite: ALH 212

ALH 214 Clinical Procedures II   3(2-2)
Introduction to clinical duties of the Medical Assistant student related to medical specialties. Review of anatomy and physiology of the human body. Disorders of the human body, diagnostic and therapeutic procedures are emphasized and critical thinking is utilized in caring for patients in the medical office.
Prerequisites: ALH 212, ALH 213
Corequisite: ALH 230

ALH 215 CPT (Current Procedural Terminology)   3(1-3)
The intent of this course is to develop an understanding of coding and classification systems in order to assign valid diagnostic or procedure codes.
Prerequisites: ALH 112, ALH 150, BIO 120
Corequisites: ALH 115, ALH 200

ALH 220 Medical Law and Ethics   3(3-0)
This course is designed to teach the legal and ethical aspects of employment in health care delivery. Case studies will be reviewed and students will become familiar with the principles of medical ethics as they apply to both physicians and medical assistants. A few of the topics to be covered are: patient obligation in a medical contract, patient confidentiality, standards of care, physician's liability for employees, release of information, and patient rights and responsibility in receiving medical care.
ALH 225 Healthcare Statistics and Quality Management  3(3-0)
This course is designed to teach the student how to abstract and maintain data for clinical databases and registries. The student will learn how to collect, organize and abstract pertinent information. They will learn how to analyze needed data, as well as compute and interpret healthcare statistics. The student will learn who develops healthcare standards, who initiates the standards in regards to Quality Management, Risk Management, and Utilization Management.
Prerequisites:  ALH 115, ALH 200, ALH 215, ALH 220, BUS 241
Corequisites:  ALH 205

ALH 230 Laboratory Procedures for the Medical Office  4(3-2)
This course is designed primarily for the allied health field, and medical assistant students in particular. The student should have a basic understanding of both biological principles and anatomy and physiology. The student will, through lecture and lab, gain an understanding of the theory of laboratory procedures as well as the skills to perform accurately in the Physician’s Office Laboratory (POL) setting.
Prerequisite:  ALH 212, ALH 213
Corequisite:  ALH 214

ALH 235 Medical Coder/Biller Internship  4(0-0)
This is a 150 hour full-time internship, where the student will be assigned to the Health Information Service Department of health care facilities. This will provide the student with an opportunity to practice related functions necessary to effectively manage the medical coding and billing operational of a healthcare facility. It will also allow the student to experience the day-to-day operations of the department and apply all the theory to real-life work situations.
Prerequisites:  ALH 115, ALH 200, ALH 215

ALH 250 Medical Assistant Office Externship  4(1-10)
This externship course provides supervised and professional work experience in a medical office setting and will include both administrative and clinical procedures. Written projects and reports will enable the student to develop management skills, professional communications and critical thinking skills.
Prerequisite:  ALH 212, ALH 213, ALH 214, ALH 230.

ALH 260 Registered Health Information Technologist Internship  6(0-6)
This is a 250 hour full-time internship; where students will be assigned to the Health Information Service Department of health care facilities. This will provide the student with an opportunity to experience the many related functions necessary to effectively manage an operational area. It will also give the student an opportunity to work extensively with a primary group of practitioners, and experience the day-to-day operations of the department and apply all the theory to real-life work situations.
Prerequisite: Completion of all courses in RHIT program.
**HUM 200, SSC 200 or SCI 200 may be taken concurrently

ALH 287 Sports Medicine Techniques for Treating Athletic Injuries  3(3-0)
This course is devoted to engendering a knowledge and the understanding of the prevention and treatment of athletic injuries. This course will acquaint students and give opportunity for concentrated study by means of participation, observation, discussion and research of some of the latest techniques, practices, problems and theories pertaining to athletic injuries; bandaging, strapping and other preventative techniques; and the treatment and care of athletic injuries.

ALH 290 Special Topics/Review of Clinical Procedures  1(1-0)
This course is designed for students who have taken ALH 210 and did not complete their externship within 12 months of the ALH 210 course. It is a review of the functions, role and responsibilities of a medical assistant in a medical office setting.
Prerequisite:  ALH 210 or permission from Department.

ALH 295-299 Current Topics in Allied Health  1-3(1 to 3-0)
These courses are designed to investigate various topics in health not included in current courses. Topics will be announced.

(AMS) AUTOMOTIVE SERVICE

AMS 104 Basic Automotive Electricity  2(2-1)
Studies fundamentals and applications in automotive electrical, electronics, voltage, current, resistance, series and parallel circuits, magnetism, application of Ohm’s Law, and wiring diagrams. Develops skills in establishing an electrical base for advanced electrical/electronic courses through the use of meters and test equipment.
AMS 110 Engine Fundamentals and Overhaul  
4.5(2-5)
Studies will include engine principles, design construction and operation. Skill development of proper service procedures of modern gas engines will be stressed. The student will remove and replace an engine from a car or light truck. They will also disassemble and reassemble a complete engine with emphasis on manufacturer’s specifications and procedures.

AMS 116 Electrical Systems I: Electrical Accessories  
3(2-2)
Studies lighting systems, instruments, warning devices, horn, and other accessory circuits using wiring diagrams. Develops skills in diagnosis, adjustment and repair of accessory and convenience circuits.
Prerequisite: AMS 104 (may be taken concurrently) or Instructor approval

AMS 124 Automotive Heating & Air Conditioning  
4(2-3)
Studies passenger car and light truck cooling, heating and air conditioning system operation and diagnosis. Will also cover the 134A system service. Develops skills in diagnosis and repair of the cooling, heating and air conditioning system components.

AMS 125 Engine Performance I  
5(2-6)
Studies review of basic electricity and magnetism, fundamentals of electronics, basic ignition systems, basic fuel systems and introduction to emission systems. This course establishes a base for advanced work in AMS 126.

AMS 126 Engine Performance II  
5(2-6)
Studies units of instruction on G.M., Ford and Chrysler throttle body and multi-port fuel injection systems. Also covers distributorless ignition systems and OBD II operation and service. The students will be performing operational tests on late model cars using scan tools and other special test tools. They will be doing driveability testing and troubleshooting on late model cars.
Prerequisites: AMS 104, AMS 125, OR State certified in engine tune-up area

AMS 205 Steering & Suspension Systems  
4(2-4)
Studies suspension and steering systems. Skill development will be focused on subframe alignment, steering, suspension, and four wheel alignment.

AMS 206 Brakes  
4(2-4)
Studies brake systems. Skill development will be focused on drum, disc, hydraulic, power assist, and anti-lock brake systems.

AMS 214 Automatic Transmissions  
4.5(2-5.5)
Studies passenger car and light truck automatic transmissions terminology, operation, service and diagnosis. Develops skills in service and repair of passenger car and light truck conventional and computer-shifted front-wheel and rear-wheel drive transmissions.

AMS 222 Manual Transmissions  
4(2-4)
Studies passenger car and light truck clutches, manual transmissions, drive shafts, differentials, transaxles, front-drive axles, and transfer cases operation, service and diagnosis. Develops skills in diagnosis and service of clutches, manual transmissions, drive shafts, differentials, transaxles, front-drive axles, and transfer cases.

AMS 223 Electrical Systems II: Engine Electrical Systems  
4(2-4)
Studies battery service, cranking systems, and charging systems. Develops skills in diagnosis, adjustment and repair of battery, cranking and charging systems.

AMS 232 Automotive Co-op  
4(1-15)
This course is a 15 hour, 15-week internship at an automotive dealership repair facility, or automotive repair facility that provides hands-on skills to enhance the professional qualifications and employment opportunities for students.
Prerequisite: Completed first, second, and third semester AMS courses with grade “C” or better. Permission of the Co-op Coordinator required. Professional tools required.

AMS 295 Special Topics/Automotive Technology  
1-3(1 to 3-0)
This course is designed to investigate various topics in Automotive Technology that are not included in current courses. Topics will be announced. This course is offered based on demand.

(ANT) ANTHROPOLOGY

ANT 170 Introduction to Cultural Anthropology  
3(3-0)
The student is introduced to the process of culture evolution as well as other anthropological theories. The purpose is to give the student an understanding of the underlying unity of the human experience while, at the same time, providing insight into cultural variability.

(ART) ART

ART 105 Drawing I – Introductory  
3(3-0)
A basic introduction to drawing media and techniques and an exploration of the concepts of space and form in varied subject matters.
ART 110 Basic Photography  3(3-0)
This course is designed for persons wanting a working knowledge of cameras, lenses, and fundamentals of photography. Topics covered include: f stops, shutter speeds, depth of field, film selection, composition, electronic flashes, and other basics. Students will be introduced to the black and white darkroom where they will develop film and produce prints.

ART 115 Design I  3(3-0)
Elements and principles of design and experiences with materials in problem situations.

ART 130 Painting I  3(3-0)
An introduction to painting with the exploration of media, techniques, and the concepts of space, form, and color.

ART 135 Graphic Design I  3(3-0)
An introduction to the concepts and techniques of visual communication. The focus is on typography, page layout, grid structure, production requirements, design history and the design problem-solving process.

ART 137 Digital Photography  3(3-0)
An introduction to digital photography and computer software used in photo manipulations. Students will learn various techniques in creating enhanced images, including color balance, sizing, sharpening. Students will learn how to download images from digital cameras and to scan photographic prints and film. Students will learn correct file formats for output and print management. Discussions will also include composition, lighting, and personal creativity.
Prerequisites: ART 110 or permission of instructor

ART 150 Printmaking  3(3-0)
Introduction to the basic techniques of woodcut and printing as a fine art.

ART 205 Drawing II  3(3-0)
A concentration of experimental media, techniques, spatial relationships, and conceptual processes of drawing. Prerequisite: ART 105

ART 210 Illustration  3(3-0)
Development of conceptual and technical skills in drawing for reproduction using various media. Prerequisites: ART 235, ART 205

ART 211 Page Layout I  3(3-0)
This course introduces the student to the software and tools used in page layout. Emphasis is on learning the software and tools and applying basic design principles in the production of files for final output. Students will learn the fundamentals of page layout, typography, effective use of color, proofing, and preparing print ready documents.

ART 215 Design II  3(3-0)
Continuation of Design I, elements and principles of two-dimensional design. Introduction to three-dimensional design through problem-solving exercises. Prerequisite: ART 115

ART 220 Figure Drawing I  3(3-0)
Students will learn to draw the human figure based on an understanding of anatomy, proportion, perspective, and the effect of light. Prerequisite: ART 205 or permission of Instructor.

ART 230 Painting II  3(3-0)
Continuation of the aims of Painting I with emphasis on personal development. Prerequisite: ART 130

ART 235 Graphic Design II  3(3-0)
A continuation of ART 135 with an emphasis on the integration of type and image in visual communication. Focuses on an exploration of tools, techniques, and hands-on skills required in the creation of professional illustrations and graphics. Prerequisites: ART 135

ART 236 Graphic Design III  3(3-0)
Continuation of ART 235 with an emphasis on refining problem-solving skills required in a professional environment. Focuses on research and analysis of visual communication, as well as the creation of portfolio-building projects. Prerequisite: ART 235 or permission of Instructor

ART 237 Photography II  3(3-0)
This course is a continuation of ART 110 Basic Photography. Students will be given advanced projects in exposure, lighting, motion control, depth control, film and composition. Projects will be completed in black and white film, with the students processing and printing their own projects. Prerequisites: ART 110

ART 238 Advanced Desktop Publishing  3(3-0)
This course examines the process of taking a design layout successfully through the stages of a computer page layout software program, pre-press, proofing, printing, finishing and binding. Students will learn the use of scanners, halftones, color separations, proper resolutions, and effective fonts. Prerequisite: CIS 210 or permission of the Instructor
ART 239 Page Layout II  3(3-0)
This course is a continuation of ART 211 Page Layout I. Students will be assigned advanced page layout projects. This course will examine all aspects of production as they relate to print, including correct document construction, color space and color systems, separations, preflight, print production and paper considerations. Projects will focus on the use of effective design principles, proper file preparation, preflight of files, and production process.
Prerequisite: ART 211

ART 240 Studio Problems in Graphic Design  3(3-0)
An opportunity for students to work independently on projects related to the graphic design industry. Included in the course will be individual assistance in preparing a portfolio for seeking employment or further education.
Prerequisites: ART 110, 130, 210, 215, 236, and 239

ART 245* Art in the Elementary School  3(3-0)
An investigation of how art fits into the Elementary School Curriculum and what its impact is on all elementary children. To be presented through lecture, readings, slides or prints, and a team teaching experience by all participants. (*Note: Please be advised that ART 245 will transfer to Central Michigan University as ART 345 only if: 1) the student has successfully completed EDU 107; and 2) 45 clock hours of pre-professional experience in K-12 classroom.

ART 280 Independent Study in Art I  3(3-0)
An opportunity for advanced students to work with an instructor on individualized projects in various selected media.
Prerequisite: Permission of the Instructor.

ART 281 Internship I  3(1-10)
Designed to provide on-site work experience in a business environment. Under cooperative supervision by the College and the work-site Supervisor, students will further develop skills and gain training in the design field.
Prerequisite: Permission of the Internship Coordinator

ART 282 Internship II  3(1-10)
Continuation of ART 281. Designed to provide on-site work experience in a business environment. Under cooperative supervision by the College and the work-site Supervisor, students will further develop skills and gain training in the design field.
Prerequisites: ART 281 and permission of the Internship Coordinator

ART 285 Independent Study in Art II  3(3-0)
Continuation of ART 280.
Prerequisites: ART 280 and permission of the Instructor

ART 290-299 Special Topics/Art  1-3(1 to 3-0)
This course is designed to investigate various topics in Art that are not included in current courses. Topics will be announced. This course is offered based on demand.

(BIO) BIOLOGICAL SCIENCES

BIO 101 College Biology  4(3-2)
Survey of major topics in biology, with emphasis on cell structure, physiology, reproduction, genetics, evolution, behavior, and morphology of plants and animals.

BIO 110 Concepts in Microbiology  1(1-0)
This course is an introductory study of microorganisms such as bacteria, fungi, algae, viruses, & protozoa. The disease process involving these microorganisms will also be studied.
Prerequisite: BIO 101

BIO 120 Introduction to Human Disease  3(3-0)
This course is designed to introduce the student to the structure of common diseases, signs, symptoms, causes and effects, as well as treatment. Students will learn how the different diseases relate to the different body systems, and other conditions.
*ALH 100 Recommended

BIO 131 Basic Anatomy and Physiology  3(3-0)
This is an introductory course to Anatomy and Physiology. It is assumed that students enrolling in this course have limited background in chemistry and biological science. The major topics presented in the course are biological principles, skeletal, muscular, integumentary, nervous, circulatory, respiratory, digestive, excretory, endocrine, and reproductive organ systems.
Prerequisite: BIO 101

BIO 135 Human Anatomy and Physiology  5.5(4-3)
This course provides students with an intensive, in-depth introduction to the structure and function of all human body organ systems. The emphasis is on homeostasis of body systems under normal structure and function, with the inclusion of some pathologies. The laboratory portion includes dissections, study of anatomical models and slides, and physiological experiments.
Prerequisites: BIO 101 or successful completion of BIO 135 entrance exam

BIO 141 Anatomy and Physiology I  4(3-2)
A lecture and laboratory course dealing with the anatomy and physiology of the human body with emphasis on homeostasis. Topics include skeletal, muscular, integumentary, nervous and digestive systems.
Prerequisite: BIO 101 or equivalent
BIO 142 Anatomy and Physiology II  4(3-2)
This course is a continuation of BIO 141. Topics include: respiratory, excretory, endocrine, reproductive, and circulatory systems. Emphasis is on physiology and integration of the systems of the body.
Prerequisite: BIO 141

BIO 201 Botany  4(3-2)
Structure and function of major groups of plants with emphasis on metabolism and reproduction.
Prerequisite: BIO 101

BIO 202 Field Ecology  3(2-2)
An introduction to a field study of basic ecology, with emphasis on the interactions between plants, animals, humans, and the environment.

BIO 203 Zoology  4(3-2)
Structure and function of major groups of animals with emphasis on complete study of selected types.
Prerequisite: BIO 101

BIO 204 Human Genetics  3(3-0)
This is an introductory course dealing with principles of inheritance as they apply to humans. This course assumes no prior background in biology or chemistry. The topics considered are basic genetic principles, molecular basis of inheritance, regulation of gene expression, mutation, and the application of these principles to human heredity. Special emphasis is given to genetic disorders and the new technologies developed to deal with them.

BIO 210 Microbiology  4(3-3)
Microbiology involves a study of the bacteria, fungi, algae, viruses, protozoa, and other related microorganisms and their relationship to our society. The laboratory acquaints the student with standard handling and culture techniques of most of these organisms, the preparation of culture media, classification techniques, representative micro-organisms (living and prepared slides) of the various groups, standard staining methods, and a number of biochemical tests.
Prerequisite: BIO 101 or a college course equivalent to BIO 101 or a grade of “B” or better, within the past 3 years in a High School Advanced Placement Biology course.

BIO 215 Radiation Biology  1(1-0)
This course is an introductory study of the biological effects of exposure to ionizing radiation. Topics include factors affecting radiosensitivity, hematologic effects, and radiation induced malignancy.
Prerequisite: BIO 101

BIO 221 Nature Study  3(2-2)
Practical knowledge of the out-of-doors is stressed. Collection and identification of plants and animals and field activities included.
Prerequisite: BIO 101 recommended

BIO 245 Advanced Anatomy and Physiology & Intro to Pathophysiology  4(4-0)
This course is an advanced study of the concept of Anatomy & Physiology with an emphasis on the disease process. It is intended for those students that have previously completed Anatomy & Physiology I & II more than 5 years ago and less than 10 years ago, and also for those students who would like to increase their knowledge of this subject matter. Pre-RAD or Pre-NUR students must complete this course with a grade of “B-” or better to qualify for admission into the program.
Prerequisite: BIO 141 & 142 completed less than 10 years ago.

BIO 268 Independent Study in Biology  1-3(1 to 3-0)
This course is designed for students who desire to advance their understanding and challenge their ability in specialized areas of biology. Library, laboratory and/or field research is required, as is a written report at the completion of the course.
Prerequisite: Satisfactory completion of at least one laboratory biology course and permission of the Instructor

BIS 100 Keyboarding   1(1-.5)
This course is for anyone who wishes to develop basic touch keyboarding (typewriting) skills on computers. Using the touch method, students learn to key (type) alphabetic, numeric, punctuation, and symbol keys; and to use the ten-key pad. In addition to classroom work, the students are required to complete a minimum of one-half hour of computer lab work per week.

BIS 105 Introduction to Microsoft Word   1(1.5)
This course is for anyone who wishes to learn some of the most popular features of Microsoft Word (up-to-date version). The course begins with basic word processing operations, commands, and functions and progresses through such topics as editing, saving, closing, printing, formatting, outlining, page numbering, mail merging, selecting fonts, viewing, zooming, handling graphic objects, finding and replacing, and using templates. In addition to classroom work, the students are required to complete a minimum of one-half hour of computer lab work per week.

BIS 100 Keyboarding   1(1-.5)
This course is for anyone who wishes to develop basic touch keyboarding (typewriting) skills on computers. Using the touch method, students learn to key (type) alphabetic, numeric, punctuation, and symbol keys; and to use the ten-key pad. In addition to classroom work, the students are required to complete a minimum of one-half hour of computer lab work per week.

BIS 290-299 Selected Topics  1-5(1 to 4-0 to 3)
Courses designed to investigate various topics in Biology not included in current courses. Topics will be announced.

(BIS) BUSINESS INFORMATION SYSTEMS

BIS 100 Keyboarding   1(1.5)
This course is for anyone who wishes to develop basic touch keyboarding (typewriting) skills on computers. Using the touch method, students learn to key (type) alphabetic, numeric, punctuation, and symbol keys; and to use the ten-key pad. In addition to classroom work, the students are required to complete a minimum of one-half hour of computer lab work per week.
BIS 106 Introduction to COREL WordPerfect  1(1-.5)
This course is for anyone who wishes to learn some of the most popular features of COREL WordPerfect (up-to-date version). The course begins with basic word processing operations, commands, and functions and progresses through such topics as editing, saving, closing, printing, formatting, outlining, page numbering, mail merging, selecting fonts, viewing, zooming, finding and replacing, and using templates. In addition to classroom work, the students are required to complete a minimum of one-half hour of computer lab work per week.
Prerequisite: BIS 100 recommended or keyboarding skills

BIS 107 Introduction to Microsoft PowerPoint  1(1-.5)
This course is for anyone who wishes to learn the fundamentals of Microsoft PowerPoint (up-to-date version). The course begins with basic word processing operations, commands, and functions and progresses through such topics as charts, templates, fills and borders, color and animation, and sound and video. Students learn to create and give quality presentations using Microsoft PowerPoint. In addition to classroom work, the students are required to complete a minimum of one-half hour of computer lab work per week. Microsoft Office Specialist (MOS) approved software is used to provide students with skills needed to complete the MOS Core Certification Exam.
Prerequisite: BIS 100 recommended or keyboarding skills.

BIS 108 Introduction to Microsoft Excel  1(1-.5)
This course is for anyone who wishes to learn some of the most popular features of Microsoft Excel (up-to-date version). The course begins with basic word processing operations, commands, and functions and progresses through such topics as creating, editing, saving, printing spreadsheets and saving, closing, and opening workbooks. In addition to classroom work, the students are required to complete a minimum of one-half hour of computer lab work per week. Microsoft Office Specialist (MOS) approved software is used to provide students with skills needed to complete the MOS Core Certification Exam.
Prerequisite: BIS 100 recommended or keyboarding skills.

BIS 109 Introduction to Microsoft Access  1(1-.5)
This course is for anyone who wishes to learn some of the most popular features of Microsoft Access (up-to-date version). The course begins with basic operations, commands, and functions and progresses through such topics as designing, creating, maintaining, editing, saving, and printing databases, generating reports and mailing labels. In addition to classroom work, the students are required to complete a minimum of one-half hour of computer lab work per week. Microsoft Office Specialist (MOS) approved software is used to provide students with skills needed to complete the MOS Core Certification Exam.
Prerequisite: BIS 100 recommended or keyboarding skills.

BIS 110 Introduction to Microsoft Outlook  1(1-.5)
This course prepares students to identify the basic features of Microsoft Outlook (up-to-date version), send messages, and use the Calendar feature effectively. In addition to classroom work, the students are required to complete a minimum of one-half hour of computer lab work per week. Microsoft Office Specialist (MOS) approved software is used to provide students with skills needed to complete the MOS Core Certification Exam.
Prerequisite: BIS 100 recommended or keyboarding skills.

BIS 120 Office Mathematics  3(3-1.5)
This course covers basic mathematical operations & concepts as applied to a variety of business and personal situations. Examples of topics: review of arithmetic operations, fractions, decimals, mortgages, taxes, checking accounts, payroll, & consumer & business credit. In addition to classroom work, each student is required to complete a minimum of 1 1/2 hours of individual lab work per week.

BIS 126 Introduction to Medical Transcription  3(3-1.5)
This course serves as an introduction to processing medical reports. Students prepare consultation reports, history and physical examination reports, operative reports, discharge summary reports, and special procedure reports including magnetic resonance imaging (MRI) reports, computerized axial tomography (CAT) reports, and sonogram reports. An integrated instructional approach is used where students learn medical terms as they appear in medical reports and relate those terms to the pathologies being treated. This course is an introduction to machine transcription for students pursuing the Associate in Business Degree: Medical Transcriptionist. In addition to classroom work, the students are required to complete a minimum of 1 1/2 hours of computer laboratory work per week.
Prerequisite: BIS 140 or competency
Corequisite: ALH 100 recommended
**BIS 127 Applied Office Accounting 4(3-1.5)**
This course covers basic accounting skills needed in the medical and legal office. Emphasis is on both the "how" and "why" of accounting and on performing the accounting function. A practice set will be used to simulate accounting transactions in the medical or legal office-based on the students' program emphasis. In addition to classroom work, the student is required to complete a minimum of 1 1/2 hours of individual lab work per week.
Prerequisite: BIS 120
Prerequisite for Medical Assistant only: MAT 104

**BIS 130 Intro to Business Information Systems 3(3-0)**
This course serves as an introduction to the concepts of word and information processing, and covers such topics as the evolution of word and information processing, the changes to the traditional office structure, a review of equipment and software characteristics, possible career paths, and a review of the types of tasks and duties performed in the word and information processing office. An introduction to office suite software is included, which teaches students the skills needed to pass core certification exams. These exams validate a student's skills, and supply objective proof to an employer, or prospective employer, that the student knows how to use the software efficiently and productively. Microcomputers are used to produce a wide variety of Business and Academic documents. Internet use and E-mail are introduced. Students will be asked to write a research paper and give an oral presentation. In addition to the classroom work, each student is required to complete a minimum of two hours of individual computer laboratory work per week.
Prerequisite: BIS 100 or equivalent
Corequisite: BIS 140

**BIS 136 Terminology & Proofreading 3(3-1.5)**
This course helps the student build a better vocabulary & improve spelling & proofreading skills. Three hundred groups of commonly confused words & special lists of frequently misspelled terms are studied. Topics include working with the dictionary, pronunciation, phonetics, word division, prefixes and suffixes, plurals & possessives, & specialized & reference vocabularies. Students improve proofreading skills by identifying errors in typing, spelling, grammar, punctuation, capitalization, format, numbers, word division, & content using appropriate proofreader's marks. In addition to the classroom work, each student is required to complete a minimum of 1 1/2 hours of individual computer lab work per week.
Prerequisites: BIS 164, ENG 111 may be taken concurrently

**BIS 140 Beginning Word Processing/Keyboarding 3(3-1.5)**
This course is designed to build a marketable keyboarding (typewriting) skill. Business letters, business forms, speed, and accuracy are stressed. Students will use the most current word processing software to create documents. Speed ranges of 25-40 words a minute are needed to pass. In addition to classroom work, each student is required to complete a minimum of 1 1/2 hours of individual computer laboratory work per week.
Prerequisite: BIS 140 or equivalent

**BIS 142 Intermediate Word Processing/Keyboarding 3(3-1.5)**
This course is designed to build a marketable keyboarding (typewriting) skill. Business letters, business forms, speed, and accuracy are stressed. Students will use the most current word processing software to create documents. Speed ranges of 40-55 words a minute are needed to pass. In addition to the classroom work, each student is required to complete a minimum of 1 1/2 hours of individual computer laboratory work per week.
Prerequisite: BIS 140 or equivalent

**BIS 164 Business Communications I 3(3-1.5)**
Students will learn/review basic grammar rules, punctuation rules, and sentence structure. Students will use the computer and current word processing software for realistic business office applications of the rules. Students will be introduced to machine transcription and will learn to use office reference manuals. In addition to classroom work, students are required to complete a minimum of 1 1/2 hours of individual computer laboratory work per week.
Prerequisite: Recommend concurrent enrollment in BIS 140 or BIS 100 or knowledge of correct keyboarding techniques.
BIS 200 Advanced Word Processing Applications 3(3-1.5)

This course gives students hands-on experience and exposure to a wide variety of advanced word processing applications using computers and the most current word processing software. The advanced word processing features included teach students the skills needed to pass expert certification exams. These exams validate a student’s skills, and supply objective proof to an employer, or prospective employer, that the student knows how to use the software efficiently and productively. Microcomputers are used to produce a wide variety of documents, as well as ways in which the software program interacts with Windows and the Internet. Practice exercises and assignments are the primary source of instruction on the microcomputer. In addition to classroom work, each student is required to complete a minimum of 1 1/2 hours of individual computer laboratory work per week. Microsoft Office Specialist (MOS) approved software is used to provide students with skills needed to complete the MOS Expert Certification Exam.

Prerequisites: BIS 140 or equivalent, BIS 130 recommended

BIS 221 Computers in Business 3(3-1.5)

This course provides insight into the applications of the computer in modern business. The student will study the components of a business computer system, typical applications involving mainframe and personal systems, structure, use of files and databases, and the concepts of networking, teleprocessing, and distributed systems; explore the techniques of business computer system development; and also develop skills in using productivity programs such as databases and spreadsheets to build models solving practical business problems. In addition to the classroom work, each student is required to complete a minimum of 1 1/2 hours of individual computer laboratory work per week.

Prerequisite or Corequisite: ACC 201

BIS 230 Transcription I 3(3-1.5)

Using the computer, current word processing software, transcription machines and a variety of reference materials, students develop skill and accuracy in transcribing from CDs and producing “mailable” documents. Transcription begins with sentences and expands to business letters and other correspondence. Emphasis is placed on correct spelling, grammar, and punctuation skills and proofreading. In addition to classroom work, the students are required to complete a minimum of 1 1/2 hours of individual computer lab work per week.

Prerequisites: ENG 111, BIS 130, BIS 136, BIS 142, BIS 164

BIS 234 Transcription II 3(3-1.5)

This course is an intense application of skills learned in business communications, English, keyboarding/word processing, transcription, and other BIS courses. The students transcribe dictated material into high-quality (mailable) typewritten documents using computers, current word processing software, CDs, and a variety of reference materials. To provide a realistic experience, a word processing simulation is used. In addition to classroom work, each student is required to complete a minimum of 1 1/2 hours of individual computer lab work per week.

Prerequisites: BIS 200, BIS 230, BIS 240

BIS 236 Medical Transcription I 3(3-1.5)

This course is an intense application of skills learned in business communications, English, keyboarding, transcription, & medical terminology. The students transcribe dictated material into high-quality (mailable/usable) documents using computers, current word processing software, transcription machines, & a variety of reference materials. To provide a realistic experience, a medical simulation is used along with dictated documents on CDs. In addition to classroom work, students are required to complete a minimum of 1 1/2 hours of individual computer lab work per week.

Prerequisites: ALH 100, BIS 142, BIS 230

BIS 238 Legal Transcription 3(3-1.5)

This course is an intense application of skills learned in business communications, English, keyboarding/word processing, transcription, and legal terminology. The student will transcribe dictated material into high-quality (mailable) documents using computers, current word processing software, cassette transcribing machines, and a variety of reference materials. A legal simulation will be used along with dictated documents on CD recordings. In addition to classroom work, each student is required to complete a minimum of 1 1/2 hours of individual computer lab work per week.

Prerequisites: BIS 138, BIS 200, BIS 230, BIS 240

BIS 240 Advanced Word Processing/Keyboarding 3(3-1.5)

Advanced keyboarding (typewriting) techniques as related to mailable production work are emphasized. Problem-solving ability is developed. To provide a realistic experience, a word processing simulation is used. Speed ranges from 55 to 70 words a minute are needed to pass. In addition to classroom work, each student is required to complete a minimum of 1 1/2 hours of individual lab work per week.

Prerequisites: ENG 111, BIS 136, BIS 142, BIS 200
BIS 246 Medical Transcription II 3(3-1.5)
This course is a continuation of BIS 236 Medical Transcription. Students continue to build their medical terminology knowledge and to transcribe and format high-quality (mailable/usable) medical documents according to guidelines set by the American Association for Medical Transcription (AAMT). Students use computers, current word processing software, CDs, and a variety of reference materials. A medical simulation is used, giving students opportunities to hear and transcribe realistic dictation in many medical specialties as dictated by medical professionals from various ethnic groups. In addition to classroom work, the students are required to complete a minimum of 1 1/2 hours of individual computer lab work per week.
Prerequisite: BIS 236

BIS 250 Records Management 3(3-1.5)
Emphasis is given to clear-cut rules established by the Association of Records Managers and Administrators (ARMA) for the alphabetic indexing and cross-referencing methods (the foundation of records storage methods), as well as the numeric, geographic, chronological, and subject methods. Students are provided realistic records management situations through the use of a simulation. Topics include creation, storage, retrieval, retention, and disposal of records as well as careers in records management. In addition to traditional/paper storage, students use the computer and current software for information storage and retrieval. In addition to classroom work, students are required to complete a minimum of 1 1/2 hours of individual lab work per week.
Prerequisites: BIS 130 or CIS 100, BIS 140 or equivalent

BIS 254 Office Procedures 3(3-1.5)
This is a capstone course planned for the last semester of the student's program and is an intense application of skills learned in previous courses. Topics include dress and grooming for business, human relations, telephone etiquette, dictation techniques, job search strategies, effective research and oral presentation techniques, interview preparation, self-analysis and self-improvement, effective research and oral presentation techniques, interview preparation, self-analysis and self-improvement, professionalism, and problem solving. Students participate in mock employment interviews and program assessment exit interviews with BIS advisory committee members. Other forms of BIS program assessment may be required. The student continues with preparation of high-quality (mailable) documents from both dictated and rough draft materials. In addition to classroom work, the student is required to complete a minimum of 1 1/2 hours of individual lab work per week.
Prerequisite: BIS 246

BIS 255 Medical Office Procedures 3(3-0)
This is a course that introduces and teaches medical assisting administrative tasks; teaches records management, medical communications, and scheduling skills; and describes procedures for preparing patients' charts and bills. Medical practice management and finances are also addressed. Multi-day simulations provide real-world experience with physician dictation. Topics include dress and grooming for business, human relations, telephone etiquette, dictation techniques, job search strategies, effective research and oral presentation techniques, interview preparation, self-analysis and self-improvement interviews. In addition to classroom work, each student is required to complete a minimum of three hours of computer laboratory work per week.
Prerequisites: BIS 130 or CIS 100, BIS 140

BIS 256 Medical Transcription III 3(3-1.5)
This course is a continuation of BIS 246 Medical Transcription II and is the capstone course on the Associate in Business Degree: Medical Transcriptionist program. Students continue to build their knowledge of medical terminology and to transcribe and format high-quality medical records according to guidelines set by the American Association for Medical Transcription (AAMT). Students use microcomputers, word processing software, CDs, and a variety of reference materials. A medical simulation is used, giving students opportunities to hear and transcribe realistic dictation in several specialties as dictated by medical professionals from various ethnic groups. Students are also given critical-thinking and problem-solving scenarios. In addition to classroom work, the students are required to complete a minimum of 1 1/2 hours of individual computer lab work per week.
Prerequisite: BIS 246

BIS 260 Co-op (Medical, Legal, General) 4(1-15)
This is a capstone course planned for the last semester of the student's program. Students will be employed in an approved Co-op position selected in conjunction with the BIS Co-op course instructor, the MMCC Co-op Coordinator, and the student. This course allows students to combine learning in the classroom with learning in the workplace. An agreement is signed by the student, the employer, and the coordinator to establish training outcomes and employer expectations. MMCC cannot guarantee that Co-op positions are "paid" positions.
Prerequisites: In order to be placed in a training site and enrolled in BIS 260, the student should have completed the first three semesters of the program and must have approval of the BIS Co-op instructor and the MMCC Co-op Coordinator.
BIS 264 Business Communications II  3(3-1.5)
This course studies approaches to verbal and nonverbal communications in business-related situations. Students will prepare written correspondence including business letters and formal business reports. Students will learn techniques for effective oral presentations including the basic creation and use of PowerPoint slides. Internet use is emphasized throughout the course. In addition to classroom work, students are required to complete a minimum of 1 1/2 hours of individual lab work per week.
Prerequisites:  BIS 164 or ENG 111

BIS 295-299 Special Topics in Business Information Systems  1-3(1 to 3-0)
These courses are designed to investigate various topics in Business Information Systems that are not included in current courses. Topics will be announced. These courses are offered based on demand.

BUS 105 Food/Beverage Management  3(3-0)
This course is designed to move the students through the various management steps involved in food service. Food production issues are studied from a managerial point of view. Standards in food production and beverage service are a focal area of the course. This course is designed to build the skills necessary to operate a successful and profitable food service operation.

BUS 122 Management Theory and Practice  3(3-0)
An analysis of the manager’s job including functions, activities, problems, and responsibilities. The course is designed for first-line supervisors as well as those engaged in middle-management positions. A study is made of reasons why some managers fail and others succeed.

BUS 151 Introduction to Business Issues  3(3-0)
A broad, introductory approach to the principles, practices, and procedures employed in modern business and industrial operations. Topics include: business organization, management, the role of stockholders, wholesale and retail marketing, finance and insurance, and location and site determination. An analysis is made of the current issues facing the business environment.

BUS 153 Business Law  3(3-0)
Deals with the principles of the law of contracts and agencies and with the legal implications of the partnership and corporate forms of business organization.

BUS 161 Principles of Merchandising  3(3-0)
A detailed study of all phases of the movement of goods from the producer to the consumer. Particular attention is paid to the role of retailers and businesses that provide services to the consumer.

BUS 162 Principles of Marketing  3(3-0)
Introduction to the field of marketing, including history, market environment, marketing mix, specialized fields, and marketing arithmetic. A study of the marketing functions such as buying, selling, transportation, storage, financing, and pricing is included.

BUS 171 Principles of Sales  3(3-0)
Basic principles of sales techniques and personality, selection of sales force, personalities of customers, and methods of increasing sales are covered.

BUS 202 Legal Environment of Business  3(3-0)
This course is an introduction to the concept and use of law as a social institution.

BUS 221 Purchasing and Inventory Control  3(3-0)
Presents a fundamental and practical approach to the problem of buying and basic merchandise control. Subject matter includes planning budgets and stock control through sales analysis.
Prerequisite: Grade of “C” or better in ACC 201

BUS 222 Labor and Management Relations  3(3-0)
This course covers the scope of industrial personnel management with emphasis upon procuring, developing, maintaining, and effectively using the work force. Attention is given to job analysis and evaluation and union-management relationships.
Prerequisite: BUS 122

BUS 225 International Business  3(3-0)
This course analyzes environmental changes as the firm expands globally. Emphasis is placed on the understanding and utilization of diversity and ethics in the development, operation and international expansion of the firm. Multi-cultural work environments, employment and labor issues, domestic and international law, global marketing, trade and finance will be examined.
Prerequisites: None

BUS 231 Principles of Advertising  3(3-0)
A survey of advertising as an instrument of modern business including various forms of advertising. Particular attention is paid to advertising for small and medium-sized businesses engaged in providing services and goods to the consumer.

BUS 241 Supervision and Personnel Administration  3(3-0)
Covers the role of supervision and personnel administration in large and small organizations. Develops techniques for hiring, training, developing, motivation, and evaluating of personnel. Covers wage, salary, and fringe-benefit administration.
BUS 250 Entrepreneurial Management 3(3-0)
A course for those persons interested in operating a small business. Course content includes financial, marketing, production management, and legal and governmental considerations which the proprietor of a successful business must manage. The course places emphasis on analysis of actual small business case studies.

BUS 255 Entrepreneurial Finance 3(3-0)
A course designed for persons desiring to operate or presently operating a small business. Course content includes the study of acquiring business ownership, initial financial planning, and on-going financing requirements. The course emphasizes actual case studies.

BUS 258 Profit Motive: Entrepreneurship 1(1-0)
The understanding of the various managerial, financial, and marketing methods used in the pursuit of profit in business. The exploration of the problems and opportunities for self-employment in the current economic environment. This course taken in combination with two additional courses selected from BUS 259, BUS 260, and BUS 261 will substitute for BUS 250.

BUS 259 Taxes/Accounting 1(1-0)
Various accounting and record-keeping systems are explored as well as the current tax structures as applied to small businesses. This course taken in combination with two additional courses selected from BUS 258, BUS 260, and BUS 261 will substitute for BUS 250.

BUS 260 Management 1(1-0)
Current supervisory, leadership, and time study management theories are studied as applied to small businesses. This course taken in combination with two additional courses selected from BUS 258, BUS 259, and BUS 261 will substitute for BUS 250.

BUS 261 Marketing 1(1-0)
Exploration of product, promotion, pricing, and distribution strategies with concentration on the social, economic, competitive, and legal business environments. This course taken in combination with two additional courses selected from BUS 258, BUS 259, and BUS 260 will substitute for BUS 250.

BUS 291 Business Internship 3(1-10)
Students will work in part-time jobs directly related to their degree programs. Training sessions are held with the employer, instructor, and student. The internship will be limited to students within one semester of graduation and will be used as a capstone course for Management & Marketing, Hospitality Management, and Small Business Management majors only. Prerequisite: Permission of the Internship Coordinator

BUS 293-298 Current Topics in Business 1-3(1 to 3-0)
Courses designed to investigate various topics in Business not included in current courses. Topics will be announced.

(CHM) CHEMISTRY

CHM 100 Fire Science Chemistry 3(3-0)
This course is designed specifically for those students on the Fire Science curriculum. The course includes the principles of basic chemistry and their application to the combustion process of fire.

CHM 105 Introductory Chemistry 4(3-2)
An elementary study of general chemistry. No previous chemistry background is necessary. The course deals with basic chemical principles and their application to inorganic chemistry. Designed for majors in liberal arts, business, pre-nursing, and to prepare students for CHM 106 or CHM 111. Two hours per week of lab work are included. Corequisite: MAT 104 or equivalent

CHM 106 Organic & Biochemistry for Allied Health 4(3-2)
Building on a background of basic inorganic chemistry, this course is intended to serve the needs of students in the ADN program and other allied health areas. The course includes an introduction into organic compounds, carbohydrates, fats, proteins, vitamins, hormones, enzymes, nucleic acids, and the energy relationships in metabolic processes. Two hours per week of lab work are included. Prerequisite: Proven competency in basic chemistry by earning a "C" or better in CHM 105 (or an equivalent college chemistry course), earning a "B" or better in a High School chemistry course (within the last 3 years), or with permission from the instructor.

CHM 111 General College Chemistry I 4(3-2)
Fundamental concepts, theories, laws and definitions as they apply to modern Chemistry. CHM 111 and CHM 112 are recommended to constitute the standard one-year course. Two hours per week of lab work are included. Prerequisites: One year high school chemistry or CHM 105 or equivalent; two years of high school algebra or MAT 105 (may be concurrent) or equivalent.

CHM 112 General College Chemistry II 4(3-2)
Continuation of CHM 111. A study of chemical equilibrium, electro chemistry, non-metals, metals, organic compounds and processes. Laboratory work includes qualitative analysis. Prerequisite: CHM 111
CHM 201 Quantitative Analysis  5(3-4)
Basic principles and methods of gravimetric, volumetric, and electrolytic analysis including solving a series of unknowns.
Prerequisite: CHM 112

CHM 241 Organic Chemistry I  5(4-3)
This course includes the study of the nomenclature, physical and spectral properties, structure, stereochemistry, and reactions (with their mechanisms) of saturated and unsaturated aliphatic and aromatic hydrocarbons, halide, alcohols, ethers, and carboxylic acids.
Prerequisite: CHM 112

CHM 242 Organic Chemistry II  5(4-3)
This course includes the study of the nomenclature, physical and spectral properties, structure, stereochemistry, and reactions (with their mechanisms) of carboxylic acid derivatives, aldehydes, ketones, phenols, amines, alcohols, nucleic acids (proteins), lipids, carbohydrates, nucleic acids, and heterocyclic compounds.
Prerequisite: CHM 241

CHM 290-299 Selected Topics  1-5(1 to 4-0 to 3)
Courses designed to investigate various topics in Chemistry not included in current courses. Topics will be announced.

(CIS) COMPUTER INFORMATION SYSTEMS

CIS 100 Introduction to Information Processing Systems  3(3-1.5)
This course is designed for students across the curriculum. CIS 100 will emphasize how the computer is used as a conceptual basis for problem solving and the role each hardware and software components play in the computer process. Students will do online research using the internet and electronic libraries. In addition, this course takes students to a higher level of learning in some of the most widely used application programs. Outside lab work is required.
Prerequisite: Touch keyboarding skills recommended

CIS 110 Computer Programming I (Visual Basic)  3(3-1.5)
A beginning level programming course using Object Oriented Programming. The student will learn programming techniques using a Windows based programming language in a graphical environment. In addition to the classroom work, each student is required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisite: MAT 104 or equivalent

CIS 111 Computer Programming II (Visual Basic)  3(3-1.5)
A continuation of CIS 110 in developing Object Oriented Languages concepts. The major project of the course is to develop a professional Windows application. In addition to the classroom work, each student is required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisite: CIS 110

CIS 111 Introduction to Java Programming  3(3-1.5)
This course is designed to introduce students to developing applications using the Java programming language, object-oriented programming concepts, along with the Java syntax needed to implement them. This course will also introduce students to Java’s role on the Internet. In addition to the classroom work, each student is required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisite: MAT 104 or equivalent

CIS 130 Applications with Microcomputers  3(3-1.5)
A study of various computer applications as applied to business problems. Applications covered include spreadsheets, windows presentation programs, and databases. In addition to the classroom work, each student is required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisite: CIS 100 with “C” or better

CIS 131 Advanced Java Programming  3(3-1.5)
This course is designed to advance student’s skills in developing applications using the Java programming language. Focusing on issues involved in designing and developing Java applications within an organization. This course will also allow students to develop Java applications for the Internet. In addition to the classroom work, each student is required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisite: CPS 150

CIS 135 Introduction to Website Design & Management  3(3-1.5)
This course is an introductory website design class which introduces participants to the basic principles of website design. A working knowledge of HTML will be gained through the use of website editing tools (Macromedia Dreamweaver). Students will learn to acknowledge important considerations in website design such as load times, bandwidth, hardware and software limitations and compatibility issues. Emerging web technologies and the proliferation of web-based technologies into today’s society will also be explored.
Prerequisite: CIS 100
CIS 151 – C# Programming I  3(1.5-1.5)
This course covers algorithm design and development. An introduction to the design and development of computer programs using the C# programming language is included. In-class work will consist of 1 ½ hours of lecture followed by 1 ½ hours of practical application. In addition to the classroom work, each student is required to do a minimum of 1 ½ hours of individual laboratory (outside of class) work per week. Required software is available on computers at the college; if students wish to complete assignments at home; they will need to procure the correct software.
Prerequisite:  MAT 104 or equivalent

CIS 152 – C# Programming II  3(1.5-1.5)
A continuation of the C# Programming 1 course, this course provides a review of topics from C# Programming 1 but focuses on the inheritance, exception handling, using GUI objects and the Visual Studio IDE, controls, event handling, and file and stream processing. In-class work will consist of 1 ½ hours of lecture followed by 1 ½ hours of practical application. In addition to the classroom work, each student is required to do a minimum of 1 ½ hours of assigned programming work outside the classroom per week (homework). Required software is available on computers at the college; if students wish to complete assignments at home; they will need to procure the correct software.
Prerequisite:  CIS 151

CIS 190 Cisco Internetworking I   4(4-1.5)
This course is the first in a series of four in the Cisco Networking Academy Program designed to teach students to design, build and maintain computer networks. Fundamentals of computer networks are the primary focus in this course. In addition to classroom work, each student is expected to complete a minimum of 1 1/2 hours of individual work per week.
Prerequisite:  CIS 100, MAT 104

CIS 191 Cisco Internetworking II  4(4-1.5)
This course is the second in a series of four in the Cisco Networking Academy Program designed to teach students to design, build and maintain computer networks. Fundamentals of the Cisco IOS (Internetwork Operating System) software and routers are the primary focus in this course. In addition to classroom work, each student is expected to complete a minimum of 1 1/2 hours of individual work per week.
Prerequisite:  CIS 190

CIS 203 Web Security and Maintenance  3(3-1.5)
This course is designed to introduce students from a variety of curriculums and educational backgrounds to web security and maintenance. CIS 203 is the second level in obtaining the Webmaster certification, and is designed to help individuals and businesses develop the skills they need to meet today's rapidly growing demand for Web and Internet communication practitioners. Little or no previous technology expertise is required, though familiarity with the operation of a personal computer is necessary and html programming is recommended. In addition to the in-class work and demonstrations, the student is required to do a minimum of 1 1/2 hours of individual laboratory work per week, some must be done at MMCC.
Prerequisite:  CIS 100

CIS 205 e-Commerce: Concepts & Technology   3(3-1.5)
This course introduces students to the basic principles of e-Commerce. The e-Commerce server software will be explored as well as crime and security problems. Students will learn which tools to use to protect networks, servers and clients. Digital payment and electronic billing models will be created. A working plan for internet marketing will be developed. Ethical, social, and political issues raised by e-commerce will be discussed.
Prerequisite:  CIS 100

CIS 210 Desktop Publishing  3(3-1.5)
This course is designed to introduce the student to computerized desktop publishing on a microcomputer. Desktop publishing terms are identified. This course will allow a student to design master page and multi-page publications. Students will use fonts and different typefaces. Page layout, text, and graphics will be incorporated into publications. In addition to the classroom work, each student is required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisite:  CIS 100

CIS 221 Computers in Business  3(3-1.5)
This course provides insight into the applications of the computer in modern business. The student will study the components of a business computer system, typical applications involving mainframe and personal systems, structure, use of files and databases, and the concepts of networking, teleprocessing, and distributed systems; explore the techniques of business computer system development; and also develop skills in using productivity programs such as databases and spreadsheets to build models solving practical business problems. In addition to the classroom work, each student is required to complete a minimum of 1 1/2 hours of individual computer laboratory work per week.
Prerequisite or Corequisite:  ACC 201
**CIS 225 Database (Oracle)  3(1.5-1.5)**
This course covers relational database concepts and tools focused in an Oracle environment. Specifically, relational database concepts (rows, tables, and keys), table creation/modification (DDL and SQL), PL/SQL, forms, reports, and database administration tasks are presented. In-class work will consist of 1 ½ hours of lecture followed by 1 ½ hours of practical application. In addition to the classroom work, each student is required to do a minimum of 1 ½ hours of individual additional laboratory work per week (homework). Required software is available on computers at the college; if students wish to complete assignments at home; they will need to procure the correct software.
Prerequisite: CIS 100, CIS 130

**CIS 230 Special Topics  1-3(1 to 3-0)**
Courses designed to investigate relevant computer information systems. Topics covered are not included in the courses that are currently listed and will be announced prior to the semester in which they are offered.
Prerequisite: CIS 100

**CIS 246 Computer Setup/Repair-Software  3 (3-1.5)**
This course provides students with the skills necessary to diagnose and correct problems that microcomputer users encounter. The course covers installing and upgrading operating systems and applications, memory optimization, and printer configuration.
Prerequisite: CIS 100 Recommended

**CIS 247 Computer Setup/Repair-Hardware  3 (3-1.5)**
This course provides the student with practical, hands-on experience in installing, maintaining, and trouble-shooting microcomputer hardware. Topics include CPU, storage devices, add-on boards, video displays, printers, communication devices, and configuration.
Prerequisite: CIS 100 Recommended

**CIS 255 Computer Operating Systems  3(3-1.5)**
A detailed study of the Windows operating system. Windows terms, commands, installation and optimizing techniques will be covered. In addition to the classroom work, each student is required to do a minimum of 1 ½ hours of individual laboratory work per week.
Prerequisite: CIS 100

**CIS 256 Microsoft Windows 2000 Pro  3(3-1.5)**
This course provides students with the knowledge and skills necessary to install, configure, customize, and troubleshoot Microsoft Windows 2000 a single-domain Microsoft Windows 2000-based network. In addition, students learn how to integrate Windows 2000 and Novell NetWare networks. In addition to the classroom work, each student is required to do a minimum of 1 ½ hours of individual laboratory work per week.
Prerequisite: CIS 270

**CIS 260 Systems Analysis  3(3-1.5)**
Introduces the student to the fundamental concepts of systems analysis and design. The role of the systems analyst and the training and skills required to function in this position are presented. Special emphasis is placed upon both written and oral communication skills. The life cycle concept and its application to business systems are discussed. Structured design techniques are emphasized. In addition to the classroom work, each student is required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisite: CIS 100

**CIS 270 Networking Essentials  3(3-1.5)**
This course serves as a general introduction for students to acquire a foundation in current network technologies for local area networks (LANs), wide area networks (WANs), and the Internet. The course provides an introduction to the hardware, software, terminology, components, design, and connections of a network, as well as the topologies and protocols for LANs. It covers LAN-user concepts and the basic functions of system administration and operation. In addition to the classroom work, each student is required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisite: CIS 110 or CIS 130

**CIS 271 Microsoft Windows 2000 Server  3(3-1.5)**
This course provides students with the knowledge and skills necessary to install, configure, customize, and troubleshoot Microsoft Windows 2000 Server with Microsoft Windows 2000-based network. In addition to the classroom work, each student is required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisite: CIS 270

**CIS 272 Active Directory Services  3(3-1.5)**
This course will introduce you to Microsoft Windows 2000 Active Directory and prepares the student to plan, configure, and administer Active Directory infrastructure. Students learn how to configure the Domain Name System (DNS) to manage name resolution, schema, and replication. In addition to the classroom work, each student is required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisite: CIS 256 or CIS 271

**CIS 273 Implementing Windows 2000 Network  3(3-1.5)**
This course is for support professionals who are new to Microsoft Windows 2000 and will be responsible for installing, configuring, managing, and supporting a network infrastructure that uses the Microsoft Windows 2000 Server production. In addition to the classroom work, each student is required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisite: CIS 271 and CIS 256
CIS 274 Microsoft Internet Information Server 3(3-1.5)
This course teaches students how to support the various features of Microsoft Internet Information Server 4.0 (IIS). Students will learn how to install, configure, and implement all components that comprise IIS. Students will also have hands-on experience setting up a Web site. In addition to the classroom work, each student is required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisite: CIS 271

CIS 280 Co-op (Computer Info Systems) 3(1-10)
Co-op is a capstone course planned for the last semester of the Associate in Business: Computer Information Systems Degree. The students will be employed in an approved co-op position selected by the college coordinator and will also attend a weekly one hour classroom lecture/discussion. A waiver may be allowed for the work component only with equivalent previous/present work experience as determined by the coordinator. An individual evaluation is made by the coordinator only upon student request. Documentation by the employer will be required.
Prerequisite: The student must have completed at least 45 credit hours on the Associate in Business: Computer Information Systems Degree.

CIS 290 Cisco Internetworking III 4(4-1.5)
This course is the third in a series of four in the Cisco Networking Academy Program designed to teach students to design, build and maintain computer networks. The focus of this course is on configuring switches and routers; configuring IGRP, Access Lists and IPX on routers. In addition to classroom work, each student is expected to complete a minimum of 1 1/2 hours of individual work per week.
Prerequisite: CIS 190, CIS 195

CIS 295 Cisco Internetworking IV 4(4-1.5)
This course is the fourth in a series of four in the Cisco Networking Academy Program designed to teach students to design, build and maintain computer networks. The focus of this course is on Wide Area Networks, PPP, ISDN, Frame Relay and all CCNA Exam-related learning objectives. It is the final preparation for taking the Cisco Certified Networking Associate examination. In addition to classroom work, each student is expected to complete a minimum of 1 1/2 hours of individual work per week.
Prerequisite: CIS 190, CIS 195, CIS 290

(CPS) COMPUTER SCIENCE

CPS 175 Computer Programming I 3(3-1.5)
This course covers algorithm design and development. An introduction to the design and development of computer programs using the C++ programming language is included. In addition to the classroom work, each student is required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisite: MAT 104 or equivalent

CPS 176 Computer Programming II 3(3-1.5)
A continuation of CPS 175, with an emphasis on elementary data structures, string manipulation, recursion, stacks, queues, linked lists, binary trees, sorting, & searching. In addition to the classroom work, each student is required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisite: CPS 175

CPS 180 FORTRAN Programming 3(3-1.5)
In this course students solve business, scientific, and mathematical problems using the FORTRAN programming language. Topics include computer terminology and concepts, problem-solving and program design techniques, arithmetic and logical operations, subscripted variables, subprograms, functions, and files. In addition to the classroom work, each student is required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisite: MAT 104 or equivalent

CPS 210 Intro to Computer Systems 3(3-1.5)
This course is designed to develop a more thorough understanding of the hardware-software interface. The student learns assembly language and the concepts of computer architecture and fundamental computer operations that are inherent in its use. Higher level data structure, control, and problem-solving concepts are thereby linked to an understanding of the internal operation of the computer. The structure of operating systems and the manner in which they manage the resources of the computer system are also presented. In addition to the classroom work, each student is required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisite: Any CPS programming course

(CRJ) CRIMINAL JUSTICE - CORRECTIONS

CRJ 200 Introduction to Corrections 3(3-0)
A study of the history, impact, and philosophy of community-based corrections services including sentencing alternatives and process, probation, parole, and imprisonment. Prisoner rights and offender profiles are also examined.
CRJ 201 Legal Issues in Corrections 3(3-0)
An introduction to the laws and procedures regarding federal and state constitutional rights, criminal case processing, court organization, and prisoner rights.

CRJ 210 Correctional Institutions 3(3-0)
A study of American prisons and jails including their purpose, treatment program availability, organizational structure, and custodial and security requirements. The effect on the incarcerated inmate as well as future correctional considerations are also examined.

CRJ 211 Client Growth and Development 3(3-0)
An examination of the psychological, social, and environmental causes of criminal behavior in juveniles and adults, the impact of psychological, sexual, medical, and substance abuse problems of offenders and intervention strategies used in institutional and community settings.

CRJ 221 Client Relations in Corrections 3(3-0)
An examination of the social and psychological formation of attitudes, their cultural influences, and their impact on minority perceptions. Discriminatory implications and professional responses in corrections are also considered.

CRJ 231 Local Detention 3(3-0)
This course is designed to prepare Correctional Officer Training students for employment at a local Corrections facility. This course will emphasize booking and intake, report writing, interpersonal communication and fingerprinting.
Prerequisites: CRJ 200, 201, 210, 211, 221

CRJ 241 PPCT Defensive Tactics 2(1-2)
This course is designed to meet MLEOTC requirements for defensive tactics. This course is also designed to prepare Correctional Officer Training students for employment at a local Corrections facility.
Prerequisites: CRJ 200, 201, 210, 211, 221
Corequisites: CRJ 231, 251

CRJ 250 Corrections Officer Training Internship 5(2-3)
The Corrections Officer Training Internship has been designed to provide the student a pragmatic work experience in a correctional institution/facility. The student will require to complete a minimum of 60 hours at an operational corrections agency. The intern curriculum will include working in a variety of institutional departments and can be adjusted in accordance to the student needs and/or interests. Students must be recommended by one or more corrections instructors and successfully interview with a Corrections Department representative.

CRJ 251 Emergency Intervention Techniques 2(2-0)
This course will introduce students to four components in jail emergency situations including: suicide intervention, First Aid/CPR, fire fighting techniques, and stress management.
Prerequisites: CRJ 200, 201, 210, 211, 221
Corequisites: CRJ 231, CRJ 241

CRJ 290-299 Special Topics in Corrections 1-5(1 to 5-0)
Courses designed to investigate current topics in corrections not included in courses currently listed. Topics will be announced.

(CST) CONSTRUCTION - M-TEC

CST 12LB Fundamentals of Electrical
The introductory open entry/open exit course covers the science that deals with electrical components and their applications in practical or applied technology. It will familiarize the student with the theory, concept and modes of operation of electrical systems. Course content covers, Ohm's law, electromagnetism, instrumentation, power supplies, output devices and many other aspects of electrical fundamentals.
CST 12LB for 1.09 credits (This course can also be taken as an individual 1.09 credit class

CST 220 Intro to Carpentry Framing 3(61-21)
This program provides a combination of internet-based, textbook, and hands-on training that addresses light commercial drawings, roofing applications, thermal moisture protection, and exterior finishing and expands on the applications presented in Carpentry Fundamentals. You CANNOT complete the NCCER Carpentry Level Two program unless you complete all three sections, CST 220, CST 221, and CST 222 completely. Students must receive a grade of "B" or better to advance to the next level and/or receive an NCCER certificate upon completion of the NCCER Carpentry Level Two program.
Note: These are non-structured, independent study programs; however, all credit bearing students must complete all assignments by the end of the semester. Before registering for any M-TEC courses, you must meet with an M-TEC advisor.
Prerequisite: CST 1100 or CSTR 2000 – NCCER Carpentry Fundamentals with a grade of "B" or better
Corequisite: MAT 170 recommended (taken either with CST 220 or CST 221)
COURSE DESCRIPTIONS

CST 221 Intro to Carpentry Finishing  3(52-30)
This program provides a combination of internet-based, textbook, and hands-on training that addresses cold-formed steel framing, drywall installation, drywall finishing, and doors and door hardware and expands on the applications presented in Carpentry Fundamentals. You CANNOT complete the NCCER Carpentry Level Two program unless you complete all three sections, CST 220, CST 221, and CST 222 completely. Students must receive a grade of “B” or better to advance to the next section and/or receive an NCCER certificate upon completion of the NCCER Carpentry Level Two program.
Note: These are non-structured, independent study programs; however, all credit bearing students must complete all assignments by the end of the semester. Before registering for any M-TEC courses, you must meet with an M-TEC advisor.
Prerequisite: CST 220 Intro to Carpentry Framing with a grade of “B” or better
Corequisite: MAT 170 (taken either with CST 220 or CST 221)

CST 222 Intermediate Carpentry Framing  3(58-24)
This program provides a combination of internet-based, textbook, and hands-on training that addresses suspended ceilings, window, door, floor, and ceiling trim, cabinet installation, and cabinet fabrication and expands on the applications presented in Carpentry Fundamentals. You CANNOT complete the NCCER Carpentry Level Two program unless you complete all three portions, CST 220, CST 221, and CST 222 completely. Students must receive a grade of “B” or better to advance to the next level and receive an NCCER certificate upon completion of the NCCER Carpentry Level Two program.
Note: These are non-structured, independent study programs; however, all credit bearing students must complete all assignments by the end of the semester. Before registering for any M-TEC courses, you must meet with an M-TEC advisor.
Prerequisites: CST 220 & CST 221 with a grade of “B” or better and MAT 170 with a grade of “C” or better

CST 230 Intro to Electrical  4(67-44)
This is the first of a two-part program that provides a combination of internet-based, textbook, and hands-on laboratory training that addresses electrical safety, conduit hand bending, different types of electrical fasteners and anchors, different types of circuits and Ohm’s Law applications, knowledge and use of electrical test equipment, National Electrical Codes (NEC), applications and construction of raceways, boxes, fittings and conductors, and reading and understanding electrical blueprints.
Note: These are non-structured, independent study programs; however, all credit bearing students must complete all assignments by the end of the semester. Before registering for any M-TEC courses, you must meet with an M-TEC advisor.
Prerequisite: CST 1000 or CSTR 1100 with a grade of “B” or better
Corequisite: MAT 170 recommended (taken with CST 230 or CST 231, or before)

CST 231 Intro to Electrical II
This is the second of a two-part program that provides a combination of internet-based, textbook, and hands-on laboratory training that addresses residential and light commercial electrical wiring. Upon completion of these two course modules, student will begin his/her 50-hour hands-on capstone project. Students will create electrical language and written electrical schematics to complete a model home electrical wiring project according to the 2005 National Electric Code Laws. This project must be completed to the instructor’s requirements before they can receive credit.
Note: These are non-structured, independent study programs; however, all credit bearing students must complete all assignments by the end of the semester. Before registering for any M-TEC courses, you must meet with an M-TEC advisor.
Prerequisite: CST 230 with a grade of “B” or better
Corequisite: MAT 170 (taken with CST 230 or CST 231, or before)

CST 1000 NCCER Core Curriculum
This program of the National Center for Construction Education and Research (NCCER) was developed by the construction industry for the construction industry. It is one of the leading nationally accredited, competency-based construction training programs in the United States. The six units (44 hours) in this series provide a solid foundation of general knowledge needed by all construction workers. Competency labs on each module must be completed to receive certificate of completion. Topics covered in this series are included in the Core Curriculum Package.
**CST 1100 NCCER Carpentry Level I**
This 8-unit series (combined with the Core Curriculum) provides training for entrance of trainee into a carpentry first-year apprenticeship. This series addresses the history of the trade, materials, tools, floor, wall, ceiling, and introductory roof framing.
Prerequisite Required: CSTR 1000 with a grade of “B” or better or permission of the instructor

**CST 1200 NCCER Electrical Level I**
This 12-unit series (combined with the Core Curriculum) provides training for electrician first-year apprentices. The series addresses safety, basic equipment, wiring, and NEC regulations. Trainees are also required to complete a 17-hour competency and a 50-hour “capstone lab” experience supervised by a Master Electrician.
Prerequisite Required: CSTR 1000 with a grade of “B” or better or permission of the instructor

**CST 1300 NCCER Electrical Level II**
This 13-unit interactive module series provides training for second-year electrician apprentices. The series addresses Motors, Grounding, Cable Trays, Service Entrances, and Electric Lighting and expands on the modules presented in Level I. Trainees are also required to complete a 17-hour competency lab and a 50-hour “capstone lab” experience supervised by a Master Electrician.
Prerequisite Required: CSTR 1000 with a grade of “B” or better or permission of the instructor

**Electrical Level One Package (DRF) DRAFTING**

**DRF 101 Technical Drawing 3(3-0)**
Basic through advanced technical sketching will be explored in order to master the skills of visualization, special perception, and basic blueprint reading. Freehand technical sketching, geometric constructions, orthographic (multi-view) projection, isometric drawings, auxiliary views, sectional views, and dimensioning will be covered as well as basic development of thread representation and manufacturing tolerances. Laboratory assignments include producing “piece part” technical drawings utilizing industry standards. Students will also be briefly introduced to a CAD program to experiment with computer-aided drafting at the end of the course.
Prerequisites: none

**DRF 105 Intro to Geometric Dimensioning & Tolerancing 2(2-0)**
This course is designed to introduce the fundamentals of geometric dimensioning and tolerancing. Intermediate through advanced blueprint reading will be explored. Emphasis is placed on basic concepts of dimensioning and tolerancing a drawing with respect to the actual function or relationship of other part features. This course is offered as an independent study course. Hours arranged with your instructor. Call (989) 386-6676 with any questions.
Prerequisite: DRF 101, IND 101, IND 113

**DRF 120 Introduction to AutoCAD 3(3-1.5)**
This course is designed to acquaint students with computer aided-drafting using AutoCAD software. System interface, creating, modifying/editing and displaying geometry, dimension styles, block insertion, scale drawings, paper space/model space usage, creating templates, and file management will be introduced to students as they create basic mechanical detail drawings and basic architectural drawings. An introduction to 3-D solid modeling will be explored at the end of the course. Each student will be required to complete a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisites: none

**DRF 201 Mechanical Detail Drafting w/CAD 4(3-1.5)**
This course will prepare the student to make working drawings of mechanical component parts and small assemblies using CAD while gaining more experience using the AutoCAD program. Emphasis will be placed on dimensioning, views, projection, and manufacturing tolerances. Additional skills will be developed in creating pictorials, depicting threads, and fasteners. Intermediate through advanced 2-D AutoCAD commands and techniques will be developed throughout the course. Each student will be required to complete a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisites: DRF 120

**DRF 210 Introduction to SolidWorks 3(3-1.5)**
Students will have a thorough introduction to 3-D parametric solid modeling design using SolidWorks. Students will explore introductory through advanced SolidWorks commands and techniques including part model creation, assembly model creation, part drawing documents, and other modeling features and commands related to 3-D solid modeling. Students will model mechanical component parts to apply commands and principles. Students are required to do a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisite: none
**DRF 220 Introduction to SoftPlan**  3(3-1.5)
Students will have a thorough introduction to 2D and 3D architectural design using Soft Plan. This class is available for students to design residential and light commercial buildings. Students will acquire the ability to design floor plans, floor systems and ceiling plans, roof plans, elevation drawings, cross section drawings, site plans, and framing diagrams. Each student is required to complete a minimum of 1 1/2 hours of individual laboratory work per week.
Prerequisites: None

**DRF 250 Drafting Co-Op**  3(0-3)
This course is designed to give previous Drafting/CAD students the opportunity to spend time as a CAD-Lab Assistant. Students enrolled in DRF 250 will provide student assistance in DRF 120-Introduction To AutoCAD.
Prerequisite: Permission of instructor

**DRF 295-299 Special Topics in Drafting & Design Technology**  1-3(1 to 3-0)
These courses are designed to investigate various topics in Drafting and Design Technology that are not included in current courses. Topics will be announced. These courses are offered based on demand.

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**ECE 101 Introduction to Early Childhood Education**  4(4-0)
This course is designed to assist the student to understand the role of the child care provider or teacher, as well as become familiar with early childhood settings, developmental milestones and developmental theories. The course will consist of lecture and field visits to child care settings or schools. This course teaches the student how to become (CDA) certified.
Prerequisite: Current (CPR) Current Cardiopulmonary Resuscitation and First Aid certification are highly recommended throughout the student tenure in ECE program.
Corequisite: ECE 112 and ECE 114 OR ECE 113 and ECE 114; ENG 111 or permission of ECE instructor or ECE Coordinator.

**ECE 112 Infancy**  4(3-2)
This course explores prenatal development and the effect on the family. Also studied is normal human development of infants from birth through 2.5 years.
Corequisite: ECE 101

**ECE 113 Early Childhood**  4(3-2)
This course explores the principles of growth and development of children ages 3-8 years.
Corequisite: ECE 101

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**ECE 114 Interacting w/ Children, Parent/Adult/Child Relations**  4(3-2)
This course will explore the theoretical perspective for interaction, and the influence of significant adults, especially parents, in the lives of children birth through age eight. Lab hours will include observation of children and adults in interaction.
Corequisite: ECE 101

**ECE 150 Preparation for Child Development Associate Credential (CDA)**  2(2-0)
This course is designed to prepare the student for assessment by the Council for Early Childhood Professional Recognition to earn the Child Development Associate Credential. The student will be guided through the preparation of a resource file, distribution of parent questionnaires, writing of statements of competence, and review of typical test questions and interview practice sessions.
Prerequisites: Be employed in a licensed or registered child care setting, or be a regular volunteer in such a program able to accumulate 480 hours working with young children. (This requirement for the CDA must be accomplished in the nine months prior to sending an application for assessment.)

Have accumulated 70 clock hours of early childhood training, either through high school vocational classes, college courses, or in-service training with an early childhood agency. Be able to document these training hours by transcript, certificates or other acceptable means. All hours must have been accumulated within the past four years.

**ECE 201 Guidance and Implementation of Programs for Young Children**  3(2-2)
All aspects of early childhood settings will be explored, including physical arrangement, curriculum development, positive atmosphere, and age and interest groupings. Students will be encouraged to use several lab settings.
Corequisite: ECE 112 and ECE 114 OR ECE 113 and ECE 114; ENG 111 or permission of ECE instructor or ECE Coordinator.

**ECE 201A Guidance and Implementation of Programs for Young Children**  2(2-0)
This course consists of the lecture component of ECE 201, but does no require the lab component. The course is recommended for any student or parent who desires to learn more about early childhood, but is not in the Early Childhood Education Program.
**ECE 202 Creative Development of the Child  3(2-2)**
This course will focus on the creative development of children. Students will learn how children become creative thinkers, and how to encourage creativity in young children. Activities will be developed for use in the lab setting that encourage creativity in movement, art, drama and music.
Corequisite: ECE 112 and ECE 114 OR ECE 113 and ECE 114; ENG 111 or permission of ECE instructor or ECE Coordinator.

**ECE 206 Parent, School and Community  3(2-2)**
This course will explore the important relationship between the early childhood program and the families involved, as well as taking a look at the school and community resources available to programs and families.
Corequisite: ECE 112 and ECE 114 OR ECE 113 and ECE 114; ENG 111 or permission of ECE instructor or ECE Coordinator.

**ECE 207 Early Childhood Education Practicum  4(1-6)**
This course takes the student into selected child care settings where they will prepare activities and give care to children in an appropriate setting, using theories and techniques learned and observed in prerequisite courses. It includes time with peers and Instructor to evaluate and discuss the field experiences.
Prerequisites: ECE 101, 112, 113, 114
Corequisite: ECE 201, 202, 206 and ENG 111

**ECE 208 Early Childhood Administration  4(4-0)**
This course is designed to give students knowledge of the “administration” of early childhood programs. Topics include: record keeping, the hiring and training of staff, child advocacy, using community resources, collaboration, public relations, advertising and fund raising.
Corequisite: ECE 112 and ECE 114 OR ECE 113 and ECE 114; ENG 111 or permission of ECE instructor or ECE Coordinator.

**ECO 110 Economics and Society  3(3-0)**
An examination of the development of economic thought and institutions with emphasis on the application of this knowledge to the understanding of today’s world.

**ECO 150 Economic Problems  2(2-0)**
Course content changes dependent upon current pressing economic problems. The topic will be announced prior to the semester in which it is offered.

**ECO 175 Personal Finance  2(0-2)**
This Individualized Learning Center course uses a variety of materials, including computer-assisted instruction, to help students learn to make wise financial decisions in choosing, spending, and conserving resources, goods, and services. The main areas covered are resource management, money management, and principles of wise consumption.

**ECO 201 Principles of Economics (Macroeconomics)  3(3-0)**
Examines major subdivisions of the American economy. Some of the specific areas studied are national income theory, money and banking, the business cycle, economic growth, and international trade.

**ECO 202 Principles of Economics (Microeconomics)  3(3-0)**
This course is designed to introduce the basic terms and concepts of economics. The economic behavior of specific economic units such as households and business firms is examined. Some principle topics are postulates of economics, supply and demand concepts, and price determination by various types of businesses.

**ECO 290-299 Selected Topics  1-3(1 to 3-0)**
These courses are designed to investigate various topics in Economics that are not included in current courses. Topics will be announced.

**EDU 107 Introduction to Teaching  3(3-0)**
Introduction to teaching as a career. Survey of students’ behavior and effective teacher responsibilities preparatory to guided observation and participation in K-12 settings.

**EDU 290 Technology in Education  3(1.5-1.5)**
Students will learn to operate various technology-based equipment; select and assess instructional media materials, courseware, and software; and integrate technology and media into K-12 instruction. This course is taught as a hybrid; 1 1/2 hours in the computer lab and 1 1/2 hours are conducted online each week.
Prerequisite: Students should have basic computer and keyboarding skills. Students must have taken EDU 107.
(EMS) EMERGENCY MEDICAL SERVICES

EMS 200 Paramedic I  13.5(13-2)
This course is part of the Paramedic Program Associate Degree curriculum. It includes the following content areas: the roles and responsibilities of a Paramedic, medical legal issues, assessment and management of emergency patients, pharmacology, advanced airway, effective communication with patients, integrating pathophysiological principles and assessment findings to formulate a field impression and implement the treatment plan for the diverse patients, safe management of emergencies. A clinical component is required.
Prerequisites: EMT 100 OR equivalent; recommended ALH 100, BIO 141, BIO 142. Age 18 or older; valid driver’s license; no felony convictions; high school diploma or GED. TB test & HBV vaccination.
Corequisite: EMS 205

EMS 205 Paramedic Clinical I  .5(0-2)
This class is the first semester clinical component of the Paramedic program. Patient assessment and intubation are performed. There is a surgical observation rotation.
Prerequisite: EMT 100 OR equivalent; recommended ALH 100, BIO 141, BIO 142. Age 18 or older; valid driver’s license; no felony convictions; high school diploma or GED. TB test & HBV vaccination.
Corequisite: EMS 200

EMS 220 Paramedic II  10.5(10-10)
This course is part of the Paramedic Program Associate Degree curriculum. It includes the following content areas: cardiology, pharmacology, toxicology, pulmonary and respiratory systems, neurology. A clinical component is required.
Prerequisite: EMS 200, EMS 205
Corequisite: EMS 225

EMS 225 Paramedic Clinical II  2.5(0-9.5)
This class is the second semester clinical component of the Paramedic program. Students rotate through the hospital and on-road clinicals. The hospital clinical includes rotations through ER, CCU, ICU, Peds, OB, respiratory, and lab.
Prerequisites: EMS 200, 225
Corequisite: EMS 220

EMS 230 Paramedic III  9 (9-0)
This course is part of the Paramedic Program Associate Degree curriculum. It includes the following content areas: Pediatrics, obstetrics, genital-urinary, gastrointestinal, trauma, shock, and environmental. A review of all Paramedic curriculum content areas is conducted. A clinical component is also required.
Prerequisites: EMS 200 and EMS 225
Corequisite: EMS 235

EMS 235 Paramedic Clinical III  5.75(0-15)
This class is the third semester clinical component of the Paramedic program. This clinical consists primarily of the on-the-road practical application of all skills learned throughout the Paramedic program sequence of classes.
Prerequisites: EMS 220 and EMS 225
Corequisite: EMS 230

(EMT) EMERGENCY MEDICAL TECHNICIAN

EMT 100 Basic Emergency Medical Technician 9(8-7)
This course provides the minimum certification to treat patients in an EMS setting. The training teaches basic anatomy and physiology, emergency care in a variety of situations, patient interactions and field work procedures. The class includes lecture and hands-on practice for field work and state testing. Upon showing competency, students begin shift rotations at hospital emergency rooms and on ambulances. Students work under the direction of hospital staff and experienced paramedics. When training is completed, students are eligible to take the state licensing exam.
Prerequisites: Assessment score placement into ENG 111 and MAT 104 or ENG 110 and MAT 101 with a “C” or better. Age 18 or older; valid driver’s license; no felony convictions; high school diploma or GED. TB test & HBV vaccination required before clinical rotations begin.

Corequisite: EMS 205

(ENG) ENGLISH

ENG 097 College Reading I  2(2-0)
Eng. 097, College Reading I (2 credits), is designed to develop the strategies, skills, and attitudes necessary for reading college-level texts. Based on reading placement score, completion of the English self-placement quiz, and discussion with an academic advisor, students may enroll in Eng. 097 in conjunction with English 110, Introduction to Academic Writing, or another course with college-level reading. Students will learn and practice a variety of reading strategies they can use to better understand what they read. In addition to strategic reading, emphasis will be on integrating critical thinking with reading, reading comprehension, reading flexibility, and expanding vocabulary. With an instructor facilitating, students will develop existing reading skills in an interactive, collaborative setting.
Prerequisites: None
Corequisites: Eng. 110 or a class with college level reading.

ENG 097 College Reading I  2(2-0)
Eng. 097, College Reading I (2 credits), is designed to develop the strategies, skills, and attitudes necessary for reading college-level texts. Based on reading placement score, completion of the English self-placement quiz, and discussion with an academic advisor, students may enroll in Eng. 097 in conjunction with English 110, Introduction to Academic Writing, or another course with college-level reading. Students will learn and practice a variety of reading strategies they can use to better understand what they read. In addition to strategic reading, emphasis will be on integrating critical thinking with reading, reading comprehension, reading flexibility, and expanding vocabulary. With an instructor facilitating, students will develop existing reading skills in an interactive, collaborative setting.
Prerequisites: None
Corequisites: Eng. 110 or a class with college level reading.
ENG 098 College Reading II  1(1-0)
Eng. 098, College Reading II (1 credit), is designed to
develop the strategies, skills, and attitudes necessary for
reading college-level texts. Based on reading placement
score, completion of the English self-placement quiz, and
discussion with an academic advisor, students may enroll
in Eng. 098 in conjunction with English 110, Introduction
to Academic Writing, English 111, Freshman Composition,
or another course with college-level reading. Students
will learn and practice a variety of reading strategies they
can use to better understand what they read. In addition
to strategic reading, emphasis will be on integrating criti-
cal thinking with reading, reading comprehension, read-
ing flexibility, and expanding vocabulary. With an instruc-
tor facilitating, students will develop existing reading skills
in an interactive, collaborative setting.
Prerequisites: None
Corequisites: Eng. 110, 111, or a class with college level
reading.

ENG 104 Reading and Writing for College  4(4-0)
Eng. 104, Reading and Writing for College, is a four credit
course that combines instruction in reading and writing
and is designed for students who have had little to no
preparation for reading and writing at the college level.
The kinds of strategies and skills students will practice
in Eng. 104 should prepare them for the kinds of reading
and writing they will do at the college level. Note: Stu-
dents who assess at a low reading level must begin the
composition sequence with Eng. 104.
Prerequisite: None

ENG 110 Intro to Academic Writing  3(3-0)
This course is meant to serve as a companion course to
ENG 111, and will utilize the same goals and outcomes.
However, ENG 110 is designed to provide incoming stu-
dents a more gradual and more thorough introduction to
the textual practices required in college (such as evidence,
critical analysis, considering rival points of view, or syn-
thesizing a new position). This course will focus on how
to read, annotate, and respond to academic texts, and will
also introduce students to writing strategies designed to
make them successful academic writers. Students who
perform at an extremely high level throughout ENG 110
may be invited to submit a portfolio for ENG 111 Portfolio
Assessment, potentially leading to credit in ENG 111.
Prerequisite: Student must meet with an advisor to reg-
ister.

ENG 111 Freshman English Composition  3(3-0)
This course prepares a student for academic writing in
the college setting, and concentrates on analyzing and
discussing written sources. Emphasis is on writing that
shows insight into published discussions of an issue and
understanding of the contexts of academic debate (rather
than on informational reports or personal expression es-
says). In addition, research and revision are treated as
integral parts of the process of writing an academically
acceptable essay. By the end of the course, a student
must show ‘competency’ in an academic portfolio of se-
lected essays.
Prerequisite: Student must meet with an advisor to reg-
ister.

ENG 111B Portfolio Tutorial  0(0-0)
ENG 111B is a one hour tutorial for students who failed
their English 111 portfolio but who otherwise would have
been eligible for a grade of “C” or better in ENG 111. The
tutorial will combine individual conferences, group work,
and classroom activities to prepare the student to resub-
mit their portfolio.
Prerequisites: A copy of the 111 portfolio and instructor
referral are required.

ENG 112 Introduction to Literature  3(3-0)
This course introduces students to a variety of literature
and enhances student’s competency in critical read-
ing and writing. The course will include introductions to
genres of literature and critical theories of reading and
responding to literature. Students should have completed
ENG 111 and have basic writing skills.
Prerequisite: ENG 111

ENG 201 English Literature I  3(3-0)
A survey of works of major authors of English literature
from Beowulf through the 18th century.
Prerequisite: ENG 111

ENG 202 English Literature II  3(3-0)
A continuation of ENG 201 from the late 18th century po-
etes through the writers of the present.
Prerequisite: ENG 111

ENG 205 American Literature to 1870  3(3-0)
A study of our nation’s authors and literature from colonial
times through the Civil War period.
Prerequisite: ENG 111

ENG 206 American Literature from 1870  3(3-0)
A continuation of ENG 205 from the Reconstruction
through mid-20th century works.
Prerequisite: ENG 111

ENG 211 Masterpieces of Western Literature I  3(3-0)
An in-depth study of selected major classical literary
works of Western civilization.
ENG 212 Masterpieces of Western Literature II 3(3-0)
A comprehensive study of leading authors from the time of the Renaissance through the 19th century.

ENG 213 Contemporary Literature 3(3-0)
Readings in the novel, short story, essay, autobiography, biography, poetry, and drama of the mid-20th century.
Prerequisite: ENG 111

ENG 222 Expository Writing and Research 3(3-0)
This course is designed to further develop skills in all phases of the nonfiction writing process with special emphasis on academic writing situations, argumentation, and library research. Writing is approached both as a way of learning and as a form of social behavior that varies according to conventions of aim, audience, and form. Instruction and assignments are partially individualized according to students’ educational goals.
Prerequisite: Grade of “C” or better in ENG 111

ENG 225 Creative Writing 3(3-0)
Introduction to the essentials of narration, characterization, and other components of creative writing. Students are required to submit original poetry and/or one-act plays or short stories.

ENG 281 Children’s Literature 3(3-0)
A review of the rich and diverse field of literature for children from preschool to adolescence. Recommended for students in the elementary teacher education curriculum.
Prerequisite: ENG 111

ENG 290-299 Selected Topics 1-3(1 to 3-0)
These courses are designed to investigate various topics in English that are not included in current courses. Topics will be announced.

(ENT) ENTREPRENEURSHIP

ENT 221 Marketing Strategies for Entrepreneurs 3(3-0)
This course provides methods of identification of a product and/or service potential, advertising plans, marketing strategies, store location, purchasing procedures and inventory control.

(ENV) ENVIRONMENTAL SCIENCE

ENV 210 Environmental Science 4(3-2)
A survey of the broad field of environmental science. Major topics included are: the scientific method, an introduction to chemistry, ecological principles, types of pollutants, energy principles, population issues, the environmental impact of human choices, and the role of economics, risk perception, and political choices in environmental decision making. Laboratory activities will expose students to a variety of field, survey and laboratory techniques useful in assessing environmental quality.
Prerequisite: Recommend BIO 101, GEL 101 or other science courses.

ENV 220 Environmental Regulations 3(3-0)
A comprehensive course in environmental law and regulations, agencies such as OSHA, DOT and EPA, and how they affect environmental usage and the individual. The course includes an overview of the history, philosophy and processes germane to environmental regulations and how to work effectively as a team member to address environmental issues and regulatory compliance concerns.

ENV 230 Environmental Training 5(3-4)
Basic measurement techniques used by environmental scientists and technologists to evaluate air and water quality, field methods, continuous monitoring techniques, and in-laboratory analysis techniques. Course includes how to properly collect and prepare samples for analysis, use a variety of instruments effectively, and how to appreciate the importance of proper sample custody and record keeping. Course also includes 40 hour personal protection and safety training.
Prerequisites: ENV 220, CHM 112

ENV 290 Environmental Internship 4-6(1-15 to 25)
This course is the “capstone” field experience for students in the environmental science or environmental technology curricula. This required course provides each student with opportunities to synthesize and integrate knowledge gained from their academic program through a process of “real world” experience, problem solving and on-the-job training. This course will allow for a broad range of learning/working experiences for students and relationships with many organizations, including other college and university units, governmental agencies, profit and nonprofit enterprises and professional organizations.
Prerequisite: ENV 230

ENV 291-299 Selected Topics 1-5(1 to 4-0 to 3)
These courses are designed to investigate various topics in Environmental Science that are not included in current courses. Topics will be announced.
**COURSE DESCRIPTIONS**

**FFT FIRE FIGHTER TRAINING**

**FFT 101 Fire Fighter I Training  8(8-0)**
This course is offered as basic training in cooperation with the Michigan Fire Training Council. The course covers information on Michigan fire laws, portable extinguishers, fire hose, fire apparatus, fire service, first aid, ladders, fire service, ropes, fire stream, forcible entry, ventilation, salvage and overhaul, rescue, and utilities. In addition, the course covers inspection practices, automatic sprinkler systems, fire department pumper operations, ladders, rescue operations, salvage activities, communications and hazard materials awareness level.

**FFT 102 Fire Fighter II Training  8(8-0)**
This course is offered in cooperation with the Michigan Fire Training Council. Topics covered include: rules and regulations, hose practice, fire apparatus, ladder practice, fire science, water supplies, forcible entry, sprinkler systems, first aid, utilities, inspection laws, portable fire extinguishers, building construction, advance rescue activities, hazard materials operation level, incident command and community relations.

**FFT 105 Fire Fighter Training III  A  4(4-0)**
This course is offered in cooperation with the Michigan Fire Training Council. The course covers Michigan fire laws, communication and supervisory skills, instructional responsibility, strategy and tactics, fire and arson investigation. Students may be allowed only one absence.

**FRN FRENCH**

**FRN 101 Elementary French  4(3-1)**
This is an elementary course designed for students who have had little or no previous experience in French. It is designed to help students acquire foundational language skills necessary for basic communication in French. The majority of class time will focus on verbal communication, however, reading and writing will be frequently integrated, and selected cultural information will be studied.

**FRN 102 Elementary French II  4(4-0)**
French 102 is a continuation of French 101 and will begin with a brief review of the material covered in FRN 101. Students in French 102 will continue the study of grammar and vocabulary and will use these to communicate utilizing speaking, writing, listening, and reading skills. This course is designed to provide the basis for further study of French at the intermediate level.

**GEL GEOLOGY**

**GEL 101 Physical Geology  4(3-2)**
An introductory study of the processes that shape our world. Topics include minerals, rocks, volcanism, earthquakes, continental drift, erosion and deposition, the ice age, and economic significance of geology to human-kind.

**GEL 112 Historical Geology  3(2-2)**
A chronological study of the origin and development of the earth’s features, along with development and succession of plant and animal groups as revealed in rock formations and mineral deposits.

**GER GERMAN**

**GER 101 Elementary German  4(3-1)**
This is an elementary course designed for students who have had little or no previous experience in German. It is designed to help students acquire foundational language skills necessary for basic communication in German. The majority of class time will focus on verbal communication, however, reading and writing will be frequently integrated, and selected cultural information will be studied.

**GER 102 Elementary German II  4(4-0)**
German 102 is a continuation of German 101 and will begin with a brief review of the material covered in GER 101. Students in German 102 will continue the study of grammar and vocabulary and will use these to communicate utilizing speaking, writing, listening, and reading skills. This course is designed to provide the basis for further study of German at the intermediate level.

**HED HEALTH EDUCATION**

**HED 115 Stress Management  2(2-0)**
This course is designed to give the student an overall knowledge and understanding of the mechanisms of stress as a concept, to provide stress management tools to increase coping, and to provide health/wellness promotion.

**HED 130 Introduction to Aromatherapy  1(1-0)**
This course is designed to be an introduction to the field of Aromatherapy. Students will learn to understand the proper usage of essential oils. Upon completion of this course, students will be qualified to apply and diffuse the top twenty oils used in aromatherapy.
HED 132 Introduction to Reflexology  1(1-0)
This course is designed to be an introduction to the field of Reflexology. Students will learn the proper techniques for performing reflexology as a stress-reducing therapy. Students will be qualified to teach an introductory 1 hour class on the therapy of reflexology, and be able to perform a half-hour therapy for the purposes of improving circulation, enhancing immunity, and reducing stress.

HED 134 Introduction to Herbology  1(1-0)
This course is designed to be an introduction to the field of Herbology. Students will learn to understand the proper usage of herbal remedies. Upon completion of this course, students will be able to recognize the most commonly used herbs, as well as how and when they should be taken. Additionally, they will be able to educate others about the proper use of herbs.

HED 136 Introduction to Massage  1(1-0)
This course is designed to be an introduction to the field of Massage Therapy. Students will learn how to perform basic massage techniques as well as learn about the professionalism of massage as a therapy. Students will be qualified to perform a one-hour relaxation massage for family and friends.

HED 151 Personal Health and Hygiene  3(3-0)
Intended to develop habits, skills, and attitudes favorable to healthful living and to understand better the normal functioning of the human body. This course encourages understanding of mental, physical, and social well-being of the individual and the community.

HED 290-299 Selected Topics in Health  1-5(1 to 5-0)
These courses are designed to investigate various topics in Health Education that are not included in current courses. Topics will be announced.

(HIS) HISTORY

HIS 101 Issues in Western Civilization I  3(3-0)
A survey of the development of Western peoples from ancient times through 1650 A.D. Emphasis is placed upon topics relating to the intellectual, social, religious, political, and economic development of Western peoples.

HIS 102 Issues in Western Civilization II  3(3-0)
This is the second semester continuation of HIS 101. The course emphasizes the development of Western peoples from 1650 to the present. Principle topics examined are the political, intellectual, social, religious, and economic developments, and their impact upon world civilizations.

HIS 211 History of the United States I  3(3-0)
This course examines the developments from exploration of the Americas through Reconstruction. Primary topics of study are exploration of colonization and its characteristics, the American Revolution, the Constitution, democratic developments, rise of States’ Rights, the Civil War, and Reconstruction.

HIS 212 History of the United States II  3(3-0)
Continuation of HIS 211. This course covers events from the post-reconstruction period to the present. Principle areas of study are economic growth, political activities, diplomacy, and social and intellectual developments.

HIS 223 History of Michigan  3(3-0)
This course examines developments in Michigan from the time of earliest human habitation to the present. Major areas examined are French and British rule and rivalry, Michigan’s move to statehood, exploitation of natural resources, and political and social development of the 19th and 20th centuries.

HIS 251 American Studies I: The Cultural Foundations of the 20th Century  3(3-0)
Along with HIS 252, this two-semester sequence centers on American cultural myths and values, examining their origins, development, and current manifestations (e.g., ideas of equality, the frontier, competition, pursuit of happiness, liberty, destiny, etc.). The approach is historical, using materials from literature, popular culture, and historical studies. This course centers on discussion stemming from assigned readings for which the instructor sets the cultural and historical context. Students desiring humanities credit should register for HUM 251.

HIS 252 American Studies II: Old Myths, New Realities in the 20th Century  3(3-0)
Continuation of HIS 251. Students desiring humanities credit should register for HUM 252.

HIS 290-299 Selected Topics  1-3(1 to 3-0)
Courses designed to investigate various topics in History not included in current courses. Topics will be announced.
(HRA) HEATING / REFRIGERATION / AIR CONDITIONING

HRA 102 Refrigeration Fundamentals 3(2-2)
As an introductory course to the field of refrigeration service, instruction is given in the handling of refrigerants, application, identification, reclaiming and refrigerant alternatives. Particular attention is paid to the principles, construction, and operation of refrigerating systems. Theory underlying refrigeration principles is covered. Laboratory experience includes cutting, soldering, swaging, and flaring of copper tubing, the evacuation and recharge of refrigeration systems, electrical troubleshooting for basic systems, the diagnosis and repair of the refrigeration system, and testing equipment typically used in the field of refrigeration service.

HRA 104 Residential Refrigeration 3(2-2)
This course studies residential refrigeration systems, to include domestic refrigeration and air conditioning. Included in the instruction are ice makers, defrost controls, diagnostic display panels and typical appliance system problems. Particular attention is paid to the principles, construction, and operation of these systems. Laboratory experience includes residential system electrical troubleshooting and repair, and the diagnosis and repair of the refrigeration system.
Prerequisite: HRA 102

HRA 105 Hydronics 3(2-2)
An introduction of the concepts involving fluid system heating devices. Topics will cover: hot water and steam heating units, terminal units, control devices, piping, and diagnosis of hydronic systems.
Prerequisite: HRA 106

HRA 106 Heating Fundamentals 3(2-2)
An introductory course into the fundamentals of heating systems and installation practices. Laboratory experience includes furnace installation, steel and copper piping, furnace and control wiring, and flue gas venting.

HRA 108 Heating Systems 3(2-2)
Residential and commercial forced air and hydronic heating systems are covered in this course. The instruction includes the fundamental operation of gas and oil burners, for both standard and high efficiency systems. In addition, system configuration and operation principles are studied for fossil fuel systems and solid fuel burners. Laboratory experiences include the trouble shooting and repair of spark ignition control systems, relay control safeties, hot surface ignition, flue dampers, and efficiency testing of heating systems.
Prerequisites: HRA 106, HRA 116

HRA 115 Plumbing 4(4-0)
This course covers the design, use, and application of potable and non-potable water systems as they apply to both water supply and waste problems. Students are involved with the practical applications of plumbing systems in a simulated environment like that found in the field.

HRA 116 Fundamentals of Electricity 3(2-2)
This course covers the principles of electrical wiring for heating, refrigeration, air conditioning and manufacturing automation. Studies of frequency, phase, resonance and reactance, along with basic resistance, capacitance, inductance, voltage, and power which govern the fundamentals of all circuits will be explored. Laboratory work will be used to develop skill in analysis, troubleshooting of basic electronic circuitry, and use of test instruments.

HRA 175 Solar Heating System 3(2-2)
This course involves the study of various systems utilized to convert solar energy to domestic and commercial heating applications. Design characteristics, efficiency, and cost of various systems are reviewed. Students engage in the design and construction of an operational solar heating system as a part of the course requirements.

HRA 198 EPA Refrigerant Handler Certification 1(1-0)
This is a 4 day course specifically designed to teach students the required knowledge necessary to pass the Environmental Protection Agency’s Refrigeration Handler Certification Exam. The specific content areas are;

Core – The basic law regarding CFC, HCFC, HFC and other chlorinated refrigerants, containments, disposal, and other certification requirements.
Type 1 – This level of certification deals with factory charged refrigeration systems containing less than 5 pounds of refrigerant.
Type 2 – This level of certification deals with all other high pressure refrigerant systems with 5 pound of refrigerant or more or are custom manufactured.
Type 3 – This level of certification deals with low pressure chiller applications.

“Universal Certification” is granted to those who pass all certification levels; the student must pass the Core section to be awarded any certification.
The Refrigerant Handler Certification textbook and exam are included.
The instructor for this course is an EPA Certified Refrigerant Handler Certification Exam instructor.
HRA 204 Light Commercial Refrigeration 3(2-2)
This course deals with more complex refrigeration systems associated with supermarkets and restaurants. Instruction and laboratory work are geared toward the installation and service of all types of light commercial refrigeration equipment such as walk-ins, reach-ins, water chillers, air cooled condensers, and water cooled condensers with cooling towers. Some of the other topics covered include heat controls for both single and three-phase systems.
Prerequisite: HRA 102

HRA 205 Motors & Controls 2(1-2)
This course in electricity concerns itself with the operation of electric motor-driven systems and devices. Classroom and laboratory experiences will include testing, troubleshooting, and repair of electric motor control systems. Electric motor-driven devices applicable to many different fields are covered, such as heating and air conditioning, machine tool and other electric-driven mechanical devices.
Prerequisite: HRA 116

HRA 215 HRA Controls 3(2-2)
A course designed to provide theory of operation, installation, and design of programmable, electric, and pneumatic controls for heating, refrigeration, and air conditioning systems. Laboratory work includes the installation, wiring, and troubleshooting of these control systems.
Prerequisite: HRA 116

HRA 220 Commercial Refrigeration Design 2(0-2)
Calculations in the sizing and design of refrigeration systems are covered in this course, as well as equipment layout and bid preparation. Topics include: "U" values, "R" values, insulation types and their installation, vapor barriers, construction details, and numerous charts, graphs, formulas, and other design material.
Corequisite: HRA 204

HRA 223 Residential HVAC Load Determination 3(3-0)
A course designed to calculate the winter heat loss; summer heat gain, and the cost of operation for a residential heating and/or air conditioning system. Manual J methods and computer software programs are used.
Prerequisites: HRA 108

HRA 225 Residential HVAC Distribution 3(3-0)
Calculations in the sizing, location, and design of forced air ducts and hydronic residential heating and air conditioning systems. Manual D methods and computer software programs are used.
Corequisite: HRA 223

HRA 240 Advanced Commercial Refrigeration 3(2-2)
This course deals with complex exotic refrigeration systems such as: environmental test chambers, supermarket refrigeration equipment, commercial ice-making equipment and ground source heat pump systems. Also included are various applied control systems and components.
Prerequisites: HRA 104, HRA 116, HRA 204

HRA 282 Insulating Systems 2(2-0)
A study of the various types of insulations currently being used in residential and commercial buildings. Also studied are the methods of installation of the various insulations as well as a comparative study of the costs of insulation, advantages and disadvantages of various insulations, and financing plans available for home and business. A course for anyone interested in energy conservation. This course cannot be used as a substitute for any course on the Heating, Refrigeration & Air Conditioning program.

HRA 283 Independent Study in HRA 3(3-0)
This course is for those students who desire to gain supervised experience in actual on-site situations to enhance their knowledge and experience in the heating, refrigeration, and air conditioning industry.

HRA 285 Co-op - Heating/Refrigeration/Air Cond 3(1-10)
HRA Co-op is a course intended to be completed after the student has attained at least 30 credit hours of instruction including prerequisites. The students will be employed in an approved co-op position selected by the college coordinator and will also attend a weekly one hour classroom lecture/discussion. A waiver may be allowed for the work component only with equivalent previous/present work experience as determined by the co-op coordinator. An individual evaluation is made by the coordinator only upon student request. Documentation of the experience will be required.
Prerequisites: Minimum of 12 credits in HRA

HRA 295-299 Special Topics in Heating, Ref. & Air Conditioning 1-3(1 to 3-0)
These courses are designed to investigate various topics in Heating, Refrigeration & Air Conditioning that are not included in current courses. Topics will be announced. These courses are offered based on demand.
HUM 101 World of Creativity I  3(3-0)
An introduction and exposure to the creative arts. Together, HUM 101 and HUM 102 are designed to give the student a basic understanding of the terminology and concepts of the visual arts, theatre, dance and music. Ideas and philosophies of specific periods are presented as a frame of reference for discussion. Speakers, films, and field trips are arranged to give the student a more distinct involvement with the arts. HUM 101 is taught chronologically and focuses on the Greek and Roman period through the Renaissance.

HUM 102 World of Creativity II  3(3-0)
Continuation of HUM 101, HUM 102 begins with the baroque period and ends with the current time.

HUM 105 Awareness of Fine Arts/Science/Society 1(1-0)
An interdisciplinary study designed to develop the student’s awareness of the interrelationships of the artistic, scientific, and technological aspects of our society, and to investigate their impact upon contemporary society from a variety of perspectives. Various methods of instruction may be used for this course including independent readings or research, lecture and discussion, projects associated with a field trip, or travel of recognized educational value.

HUM 106 Awareness of Fine Arts/Science/Society 1(1-0)
A continuation of HUM 105. A student may not receive credit in the same course more than once.

HUM 107 Awareness of Fine Arts/Science/Society 1(1-0)
A continuation of HUM 105 and 106. A student may not receive credit in the same course more than once.

HUM 108 Awareness of Fine Arts/Science/Society 1(1-0)
A continuation of HUM 105, 106, and 107. A student may not receive credit in the same course more than once.

HUM 183 Asian and African Cultures  3(3-0)
An exploration of specific “non-Western” cultures, past and present. Cultural focus may vary from term to term. The course is an investigation of their religions and artistic traditions, their ideas, their cultural achievements, and their associations with other cultures.

HUM 200 Modernity & Culture  3(3-0)
This course is designed to introduce students from a variety of programs to the humanities. This introduction will focus on the way the humanities and their concern with art, ethics, history and culture, impact on the way we construct ourselves and our sense of meaning. This course will stress interaction through writing, collaborative assignments, presentations, and discussions to emphasize the humanities’ commitment to self-discovery and expression.
Prerequisites: Level I General Education courses (CIS 100, MAT, ENG 111, SPE 101 or SPE 257)

HUM 213 Contemporary Literature  3(3-0)
Readings in the novel, short story, essay, autobiography, biography, poetry and drama of the late-20th Century.
Prerequisites: ENG 111, ENG 112 or equivalent

HUM 225 Study Abroad  2(2-0)
An interdisciplinary study abroad course, offering students a unique insight into what is offered via traditional classroom experience. This class will study different aspects of a specific society. Students will interact directly with the idiosyncrasies of a specific culture and understand aspects such as: language, history, food, currency, religion, architecture, and ideas. The course will consist of combinations of lectures, tours, field research, cultural events, interviews, meetings with local experts, and a journal.
Prerequisites: Instructor’s Approval Needed

HUM 251 American Studies I: The Cultural Foundations of the 20th Century  3(3-0)
Along with HUM 252, this two-semester sequence centers on American cultural myths and values, examining their origins, development, and current manifestations (e.g. ideas of equality, the frontier, competition, pursuit of happiness, liberty, destiny, etc.) The approach is historical, using materials from literature, popular culture, and historical studies. The course centers on discussion stemming from assigned readings for which the instructor sets the cultural and historical context. Students desiring social science credit should register for HIS 251.

HUM 252 American Studies II: Old Myths, New Realities in the 20th Century  3(3-0)
Continuation of HUM 251. Students desiring social science credit should register for HIS 252.

HUM 294 Field Experience in Fine Arts  3(3-0)
A travel course of an interdisciplinary nature where the world of theatre, music, dance and the visual arts are explored in a metropolitan area.
Prerequisites: HUM 102 and/or any other TAI course recommended
HUM 295-299 Current Topics in the Humanities 3(3-0)
Courses designed to investigate various topics in Humanities not included in current courses. Topics will be announced.

**IND (INDUSTRIAL TECHNOLOGY)**

**IND 101 Basic Machine Shop Practices** 4(2-4)
This course is an introduction to machine tool operation and associated processes. Students will become familiar with milling machines, engine lathes, the drill press, grinding machines and bandsaws. A knowledge of machining terminology and concepts such as speeds and feeds, tool geometry, blueprint interpretation as well as skill in the use of precision measuring tools will be developed.

Prerequisites: IND 101, grade of “C” or better in MAT 104 or equivalent

**IND 102 Machine Tool Practices II** 4(2-4)
The second semester Machine Tool lab course in a four semester sequence. Thread manufacturing, precision grinding, and boring operations are explored. The ability to precisely place and inspect geometric features to determine product conformance is developed in lecture and lab demonstration.

**IND 113 CNC Machining** 2(1-2)
An introduction to the use of computer numerical control machine tools, this course will develop an understanding of the components, functions, safety concerns and maintenance of CNC milling machines and lathes. The role of the CNC machine operator in establishing the workpiece coordinate system, tool changing and the use of offset functions will be explored.

**IND 116 CNC Programming** 4(2-4)
This course prepares students to program and operate Computer Numerical Control lathes and milling machines. Standard EIA code format, canned cycles, communications, manual data input, machine operation and maintenance are topics of instruction. Students solve cutter location coordinate problems and write CNC programs which they load and run on industrial machines.

Prerequisites: IND 101, IND 113, grade of “C” or better in MAT 105 or equivalent

**IND 121 Manufacturing Processes** 2(2-0)
A survey of the processes used to manufacture parts in quantity, this course is focused upon foundry, forming, stamping, metal finishing and joining technologies. Tours of manufacturing facilities augment classroom instruction and develop understanding of the scope of manufacturing enterprise in the local economy.

**IND 140 Metallurgy & Industrial Materials** 3(3-0)
An applied course covering the physical and mechanical properties, classification systems and heat treatment procedures for common ferrous and non-ferrous metals. Lab experiences include quench and temper, carburizing, tensile and hardness testing.

**IND 171 Introduction to CAD/CAM** 3(3-0)
The third course in the associate degree program dealing with Computer Numerical Control of machine tools. This course teaches the student to use the latest graphics-based software to produce CNC programs for the production of complex 3D surfaces.

Prerequisites: IND 116, DRF 120 OR Instructor permission

**IND 200 Industrial Topics** 3(3-0)
This course is designed to cover topics of an industrial nature having to do with, but not limited to, material processing, manufacturing, material handling, material shaping, and tool design. Persons employed in related industry and students in the Machine Tool, Drafting, Welding and related programs gain meaningful insights into current technology. This is not a regularly scheduled course, but is offered when there is sufficient interest.

**IND 211 Advanced Machine Shop Practices** 4(2-4)
Jig and fixture design and construction, process planning concepts, and standards for assembly hardware are the basis for instruction. The ability to perform complex machining tasks permitting the assembly of mating parts with a focus on setup and tooling for production is developed.

Prerequisite: IND 102

**IND 212 Tool, Die and Mold Manufacturing** 4(2-4)
A course devoted to the study of practices, designs, processes and materials used by toolmakers in the machine trades. Toolmakers are those qualified machinists who build dies, molds, cutting tools, jigs, fixtures, gauges and test instruments which are the basis for production manufacturing.

Prerequisite: IND 211

**IND 215 Statistical Quality Control** 2(2-0)
This course gives the student an understanding of quality control in industry, how it is achieved, how to use statistics to measure its probability of occurrence, methods of measurement, and means of control in the production process.

**IND 250 Industrial Safety** 3(3-0)
This course is designed to acquaint supervisory personnel with the requirements of OSHA and MIOSHA for the maintenance of safety provisions and accident prevention. Emphasis is placed on discussion and development of accident prevention plus plans to eliminate real and potential safety hazards.
IND 270 Principles of Robotics 3(3-0)
This course covers the construction, accuracy, speed, application, and programming necessary for robotic tools found in industry. The method of selecting the proper robotic tool for a job is covered along with the selection of the proper gripper required for the job. The principles of hydraulic and electrical systems are included so students have a better understanding of how robotic tools move.

IND 280 CNC Applications I 3(0-4)
This course develops CNC programming skills, improves competencies in CNC machine operation, and provides opportunities for students to utilize computer assisted programming skills in actual machining situations. Students design and create a postprocessor program for a lathe and for a milling machine.
Prerequisite: IND 171

IND 285 Co-op (Industrial Technology) 3(1-10)
Co-op is a capstone course planned for the last semester of the Associate in Applied Science: Machine Tool Technology Degree. The students will be employed in an approved co-op position selected by the college coordinator and will also attend a weekly one hour classroom lecture/discussion. A waiver may be allowed for the co-op experience by presenting evidence of current and appropriate employment to the co-op coordinator.
Prerequisite: The student must have approval of the co-op coordinator to be placed in a co-op situation.
Corequisite: IND 212

JOR 100 Print Media Practicum 1(1-0)
This course is designed to give the student practical experience with the print media through contributions to various publications of the College. Topics include writing style, layout, editing, photography, graphics, and ethics.

JOR 120 School Newspaper Publications 3(3-0)
A basic study of journalism as it relates to the publication of a school newspaper.

JPN 101 Introductory Japanese 4(4-0)
This is an introductory course in Japanese language, designed for students with little or no previous knowledge of Japanese. This course introduces the basic structure and vocabulary of modern Japanese, stressing the use of Japanese orthography (the writing system) from the very outset, so the subsequent adjustment to reading ordinary Japanese literature is minimal. Emphasis will be on vocabulary and oral training for conversation with reasonable ease, with an introduction to readings and writing. Familiarity with the sociocultural context in which the modern Japanese language is used will also be stressed.

JPN 102 Elementary Japanese II 4(4-0)
Students in Japanese 102 will continue to learn the basic language skills covered in 101 with increased emphasis on vocabulary, informal language and quick, natural-sounding speech.
Prerequisites: JPN 101 or previous study of Japanese with instructor approval

LEN 200 Evidence 3(3-0)
A study of the rules of evidence, from its historical development through the present, pertaining to criminal cases. This course provides an examination into the testimonial, documentary and real evidence as discovered, and evaluated by police in anticipation of a criminal trail.
Prerequisite: LEN 203

LEN 201 Fundamentals of Supervision & Management in Criminal Justice 3(3-0)
An introductory course designed to acquaint the student with the basics of management and supervision. Criminal Justice roles and responsibilities are examined. Management styles are discussed. Issues of management, operations, employment, training, community relations, and leadership styles all receive attention within this course.

LEN 202 Juvenile Law & Procedures 3(3-0)
This course will examine a broad spectrum of trends and causation of juvenile delinquency, specific treatment techniques, ways of controlling and preventing delinquency, and the role of the law enforcement officer in dealing with all aspects of the legal basis of the police officer's work with juveniles.
LEN 203 Criminal Law for Police Officers  3(3-0)
This course is designed to familiarize persons or refresh law enforcement personnel with the purposes and functions of criminal law in the operation of a law enforcement agency. Topics of discussion include philosophy and source of criminal law, criminal procedure, search and seizure, arrest, specific crimes, judicial procedure, and other topics such as defendant rights.
Prerequisite:  LEN 205

LEN 204 Criminal Investigation  3(3-0)
This course covers the fundamentals of criminal investigation including techniques of surveillance; search at the scene of the crime; collection, recording and preservation of evidence; interviewing witnesses; interrogation of suspects; methods used in the police science laboratory; and cooperation with other agencies in investigation procedures.
Prerequisite:  LEN 205

LEN 205 Introduction to Law Enforcement & Criminal Justice  3(3-0)
An introductory course designed to acquaint the student with the components of the criminal justice system. Corrections, courts, police systems are examined. The criminal justice process is explored in detail. The history, relationships, administration, and philosophy of the criminal justice system are also examined.

LEN 289 Police Academy  21(0-42)
Mid Michigan Community College has signed articulation agreements with Delta College and Kirtland Community College whereby the student completes Police Academy coursework on the Delta or Kirtland campus. Students who successfully complete the Police Academy Training at Delta College or Kirtland Community College, will receive Mid Michigan Community College credit. In order to receive credit, a student must submit an official transcript, showing satisfactory completion of the Basic Police Academy, as specified by MCOLES (Michigan Commission on Law Enforcement Standards).

(MAT) MATHEMATICS

MAT 060 Math Study Skills  1.5(1.5-0)
This course will emphasize study skills important for success in mathematics courses. Topics to be covered include note taking, homework issues, how to study math, test taking, how to use the textbook, and anxiety. It is strongly recommended that students take another MAT course concurrently with MAT 060. Credit/no credit only. Prerequisites: None

MAT 101 Basic Mathematics  3(3-0)
A review of basic operations with fractions, decimals, ratios and proportions, percent, taxes and interest. Other topics will include statistics, geometry, and the English and metric measuring systems. Emphasis will be placed on applications which will aid the student in functioning in a technical society.
Prerequisite:  None
Please note: MAT 101 is also offered as a two-semester sequence and a three-semester sequence, see next.

MAT 101A Basic Mathematics  1(0-2)
MAT 101B Basic Mathematics  1(0-2)
MAT 101C Basic Mathematics  1(0-2)
These Math Lab courses consist of one credit modules designed to allow the student to learn at a pace that will help them be successful in Basic Mathematics. MAT 101 includes a review of basic operations with factors, decimals, ratios and proportions, percent, taxes and interest. Other topics will include statistics, geometry, and the English and metric systems. Emphasis will be placed on applications which will aid the student in functioning in a technical society.
Prerequisite:  None for MAT 101A. Must have a “C” or better in MAT 101A to take MAT 101B. Must have a “C” or better in MAT 101B to take MAT 101C.

MAT 101X Basic Mathematics  1.5(1-2)
MAT 101Y Basic Mathematics  1.5(1-2)
MAT 101X and MAT 101Y semester sequence covering the same material as the traditional classroom version of MAT 101. MAT 101X includes basic operations on whole numbers, fractions, and decimals, as well as using rates, ratios, and proportions. MAT 101Y includes percent applications, descriptive statistics, unit conversions, plane and solid geometry, and the real numbers. Note: Students choosing to take MAT 101 as a sequence must complete either the ABC sequence or the XY sequence to complete MAT 101. Courses from the two sequences cannot be mixed.
Prerequisite: None for MAT 101X. Must have a “C” or better in MAT 101X to take MAT 101Y

MAT 102 Algebraic Concepts  3(3-0)
Algebraic Concepts is a three credit class designed for the student with little or no previous algebraic background. It will acquaint the student with basic algebraic concepts as well as prepare them to take MAT 104. Also it gives the student the foundation to be successful in the mathematics required in other Mid Michigan Community College programs.
Prerequisites: None
MAT 104 Basic Algebra 3(3-0)
Topics include real numbers, first degree equations and inequalities, special products and factoring, rational expressions, graphs, and linear systems.
Prerequisite: Grade of “C” or better in MAT 101 OR MAT 102 OR equivalent.
Please Note: MAT 104 is also offered as a two-semester sequence and a three-semester sequence, see next.

MAT 104A Basic Algebra 1(0-2)
MAT 104B Basic Algebra 1(0-2)
MAT 104C Basic Algebra 1(0-2)
These Math Lab courses consist of one credit modules designed to allow the student to learn at a pace that will help them be successful in Basic Algebra. MAT 104A includes basic rules, signed numbers, basic equations, and inequalities and applications; MAT 104B includes constructing and interpreting graphs, and working with exponents and polynomials; MAT 104C includes factoring, solving equations, and working with rational expressions. Completions of all three modules are equivalent to MAT 104.
Prerequisite: Grade of “C” or better in MAT 101 OR MAT 102 OR equivalent to take MAT 104A. Must have a “C” or better in MAT 104A to take MAT 104B. Must have a “C” or better in MAT 104B to take MAT 104C.

MAT 104X Basic Algebra 1.5(1-2)
MAT 104Y Basic Algebra 1.5(1-2)
MAT 104X and MAT 104Y are a two semester sequence covering the same material as the traditional classroom version of MAT 104. MAT 104X includes algebraic expressions, signed numbers, linear equations, linear inequalities, applications, and linear graphing. MAT 104Y includes integer exponents, polynomials, factoring, solving polynomial equations, rational expressions, and solving rational equations. Note: Students choosing to take MAT 104 as a sequence must complete either the ABC sequence or the XY sequence to complete MAT 104. Courses from the two sequences cannot be mixed.
Prerequisite: Grade of “C” or better in MAT 101 OR MAT 102 OR equivalent to take MAT 104X. Must have a “C” or better in MAT 104X to take MAT 104Y.

MAT 116 Business Mathematics I 3(3-0)
A course designed to show students how algebra can be applied to solve a variety of problems encountered in business management. Topics covered include: mathematical models, mathematics of finance; functions; linear functions; systems of linear equations and inequalities; linear programming; simplex logarithms; quadratic functions; and exponential functions.
Prerequisite: Grade of “C” or better in MAT 105 or equivalent

MAT 124 Precalculus 5(5-0)
Preparation for students who desire to study calculus. Topics include properties of real numbers, inequalities, data analysis, modeling, functions and relations, logarithms and exponential functions, circular and trigonometric functions.
Prerequisite: Grade of “C” or better in MAT 105 or equivalent

MAT 126 Calculus I 5(5-0)
The first of a series of four courses for mathematics, engineering, and science students. Topics include limits, continuity, differentiation of algebraic and trigonometric functions, applications of derivatives, fundamental integration, exponential and logarithmic functions.
Prerequisite: Grade of “C” or better in MAT 124 or equivalent
MAT 170 Technical Mathematics II  3(3-0)
This applied mathematics course is for students who already have satisfactory arithmetic skills, or who have completed an introductory course, such as MAT 101. The object of the course is to apply geometry and trigonometry to realistic machine tool problems. Many problems will require the student to work with engineering drawings or blueprints. Topics covered will include signed numbers, the Cartesian coordinate system, solving equations, circles and arcs, geometric constructions, and trigonometry. Students are expected to have a scientific calculator. Calculator operations will be covered in class.
Prerequisite:  MAT 101 or equivalent

MAT 212 Introduction to Probability and Statistics  3(3-0)
Selected topics from probability, variable, data collection and summarization, distribution, hypothesis testing, regression, and correlation. An interest course for use in teaching, science, business, biology, sociology, psychology, economics and more.
Prerequisite:  Grade “C” or better in MAT 104 or equivalent

MAT 216 Business Mathematics II  3(3-0)
This course is a sequence to MAT 116 and covers topics such as exponential and logarithmic functions, derivatives, integration, and applications to business situations.
Prerequisite:  Grade of “C” or better in MAT 116 or equivalent

MAT 217 Business Calculus   4(4-0)
A continuation of MAT 116. This course is now four credits, an expansion of the previous three-credit MAT 216 course. Fundamental calculus operations applied to business and financial situations. Topics will include limits, derivatives and their applications, curve sketching and optimization, exponential and logarithmic functions, integration and applications, an introduction to functions of several variables, and the mathematics of finance. Students are required to have a graphing calculator. The Texas Instruments TI-83+ calculator is strongly recommended.
Prerequisites:  MAT 116 with a grade of “C” or better

MAT 218 Mathematics for Elementary Teachers II  3(3-0)
Continuation of MAT 118 to include decimals, percent, ratio-proportion, geometry, probability, statistics, introduction to algebra and microcomputer use.
Prerequisite:  Grade of “C” or better in MAT 118

MAT 225 Calculus II  4(4-0)
Topics include indeterminate forms, methods and applications of integration, improper integrals, parametric equations, polar coordinates, and infinite series.
Prerequisite:  Grade of “C” or better in MAT 126 or equivalent

MAT 226 Calculus III  4(4-0)
Topics covered include: functions of n-variables, partial differentiation, multiple integration, solid analytic geometry, 3-space vectors, and Green’s Theorem.
Prerequisite:  Grade of “C” or better in MAT 225 or equivalent

MAT 230 Introduction to Linear Algebra   3(3-0)
This course acquaints students with the theory and elementary application of vectors and matrices. Topics include linear systems, matrices, vectors, vector spaces, and linear transformations.
Prerequisite:  Grade “C” or better in MAT 126 or equivalent

MAT 290-299 Selected Topics   1-5(1 to 5-0)
Courses designed to investigate various topics in Mathematics not included in current courses. Topics will be announced.

(MID) PERSONAL DEVELOPMENT

MID 101 Strategies for Success in College   2(2-0)
This course is designed for first time and returning college students. To develop the attitudes and behaviors of successful college students, the course covers topics such as learning styles, critical thinking, reading and comprehension strategies, as well as note taking, test taking, and time management strategies. Students will discuss and practice various techniques. By becoming familiar with the various styles of learning, studying, reading, and test taking, students will identify the ways that work best for them.
Prerequisites:  None

MID 102 Career Exploration and Development   1(1-0)
Career Exploration and Development is an 8 week, one credit course for new and returning students. This course will focus on assisting students in identifying their career goals through self assessment of interests, aptitudes, and world of work preferences. Students will also learn resume and cover letter development, interview techniques, and job search strategies.
Prerequisites:  None
Corequisite:  This course must be taken in conjunction with at least one other course, not PED.

MID 103 Human Relations   3(3-0)
This is an applied social science course. Focus will be on theory and research from the social sciences (primarily psychology) that apply to an individual’s personal and professional development. This course is not intended solely for psychology or other social science majors, but for any student who is interested in improving psychological well-being.
Prerequisites:  None
MID 104 First Year Experience 2(2-0)
This course encourages academic and social interaction with peers, faculty and staff, and other members of the MMCC community. The students will learn to have an active role in their education. Participation in the course facilitates improvement of creative and critical reasoning, study habits and preparation skills, information literacy, and presentation skills. This course provides the groundwork for independent and self-motivated learning and introduces or reintroduces students to skills and abilities which will allow them to thrive in a changing college environment.
Prerequisites: None

(MNF) MANUFACTURING -- M-TEC

MNF 1000 Fundamentals of Pneumatics 3
The open entry/open exit course will familiarize the student with the theory, concepts and modes of operation of pneumatic components. This course is a systems approach to air logic circuit development and functionality. The course will cover symbols, theory, and lab application.

MNF 1100 Programmable Logic Controllers 3
This hands-on training allows students to develop competence in operating, programming, and troubleshooting an actual industrial programmable logic controller. The hardware in combination with a student manual creates a curriculum that begins with basic wiring concepts and continues incorporating circuits, ladder logic, programming, and troubleshooting.

MNF 1200 Fundamentals of Hydraulics 3
The open entry/open exit course covers the science that deals with the laws governing water or other liquids in motion and their applications in partial or applied technology. It will familiarize the student with theory, concept, and modes of operation of hydraulic components. This course is a systems approach to hydraulic circuit development and operation. The course will cover symbols, theory, and lab application.

MNF 1300 Basic Electrical Theory 3
The course covers basic rules for AC/DC circuits including how Kirchoff's law is applied to circuit analysis. Students will be exposed to a comprehensive, systematic approach to the study and application of basic operations of electrical circuits. Activities include inductive troubleshooting, safe circuit operation, analyzing electronic components and circuits.

MNF 1400 Industrial Drives & Mechanisms 3
This module is for students who wish to gain basic knowledge in the use of industrial drives and mechanisms. Students will familiarize themselves with various types of industrial drives and mechanical components, and their applications in practical and applied technology through both theory and concept and hands-on lab applications.

MNF 1500 Basic Applications of Industrial Sensors 2
This module will introduce the students to the identification, application, and design of fiber optic sensing technologies used in today's industry. Students will become familiar with various fiber optic sensing units, limit switches, and their applications in practical and applied technology through both theory and concept and hands-on lab applications.

MNF 1600 Basic Introduction to Robotics 2
This course will familiarize the student with the basic function and operation of the Microbot Teachmover II Robot and its axis of motion. Students will learn the basic principles of programming using the Microbot's Teach Pendant to program the robot to perform specified tasks to operate the Pick and Place Robot, Auxiliary Turntable Device, and numerous outputs.

MNF 1700 Manufacturing Print Reading Basics 3
This course will provide participants with hands-on introduction to the art of reading blueprints commonly used in the manufacturing industries. The curriculum starts from basic drawing office practices through simple component drawings and ends with complex system and structural drawings currently used in the manufacturing industries.

MNF 1800 CNC Machine Tool Practices 3
This course is designed to offer the student a complete breakdown of machine tool practices. Using the textbook in association with its project oriented workbook, students will gain knowledge in shop safety, hand tools, dimensional measurement and how to accurately use precision tools, understanding and identification of materials, layout practices, preparation for machining operations, sawing machines, drilling machines, turning machines, vertical milling machines, horizontal spindle milling machines, grinding processes, and computer numerical control processes.
MNF 1900 Geometric Dimension & Tolerance  2
Product engineering drawings are the primary means of communicating design requirements and true functional limits of acceptable part geometry. To ensure uniform interpretation of all drawings, each user must have a common understanding of all symbols on the drawing. This course focuses on the principles of geometric tolerance and how it complements conventional tolerance; stack up tolerances, Tolerance of Position (TOP) Controls, Centricity and Symmetry Controls, Run out Controls, and Profile Controls. GD&T techniques are described according to the definition in the ASME Standards and through application examples in various drafting standards. Exercises provide participants with opportunities to become conversant in the GD&T language by converting design requirements into symbol form and performing geometric tolerance calculations. This course is designed for a small team to work on an actual production or in-design product.

**NOTE: Transfer of credit guidelines from DRF 105 Geometric Dimensioning & Tolerance to MNFG 5500/MNF 1900 criteria: Students must have attained an A in DRF 105 or they must complete MNFG 5500/MNF 1900 competency exam at 100% to receive certificate for MNFG/MNF 1900 from M-TEC. **NOTE: This is an Open Entry/Open Exit program; however, all credit bearing students must complete this course in the structured time frame of regular MMCC semester guidelines.

MNF 2000 Statistical Process Control  2
Statistical Process Control (SPC) is a method of monitoring, controlling and, ideally, improving a process through statistical analysis. Its four basic steps include measuring the process, elimination variances in the process to make it consistent, monitoring the process, and improving the process to its best target value.

MNF 2100 Manual Mill & Lathe  2
Basic Milling Procedures: Covers the setup and use of the horizontal milling machine, and describes the functions of basic cutters and attachments. Uses "hands-on" projects so trainees actually gain experience on the milling machine which includes a component project that can have practical value in the shop when finished. Competency is demonstrated by machining a component to industry standards. Machine Shop Turning Operations: Covers the major types of lathes and their attachments, safety, maintenance, job preparation and basic lathe operations. Discusses all facets of drilling and boring, types of drills and drill presses, and job bores. Explains reaming and reamer terms. Covers threads and threading. Competency is demonstrated by machining specified components to industry standards.

Prerequisite  **NOTE: Transfer of credit guidelines from IND 102 Basic Machine Tools Practices II to MNFG 6501/MNF 2300 criteria: student must have attained an A in IND 102 or they must complete MNFG 6501/MNF 2300 competency exam at 100% to receive certificate for MNFG 6501/MNF 2300 from the M-TEC. **NOTE: This is an Open Entry/Open Exit program; however, all credit bearing students must complete this course in the structured time frame of regular MMCC semester guidelines.

MNF 2200 Introduction to CNC Programming  2
This self-paced comprehensive training module in which the student will be introduced to CNC Programming Codes using the EMCO PC Mill 50 CNC Machine and FANUC 0 Software. This course will familiarize the student in learning G and M codes, translating print drawings into CNC Programming Codes, become familiar with general CNC principles and its functions. This is a prerequisite to MNFG 6501 CNC Programming.

MNF 2300 Intermediate CNC Programming  4
Students will be introduced to the HAAS Model VF 1 Machine Center and its functions. Coursework will include textbook, supporting workbook, and supplemental video instruction in CNC operation. Students will gain sufficient knowledge in the structure and operation of the Haas and Mazak CNC machines. Students will perform a number of structured exercises until they became competent in the programming and operation of these machines. Final project will require the student to design their own machined part drawing with supporting documentation and tolerances to be inspected by the Subject Matter Expert before actual machining is to be done. NOTE: Transfer of credit guidelines from IND 116 CNC Programming to MNFG 6501/MNF 2300 criteria: student must have attained an A in IND 116 or they must complete MNFG 6501/MNF 2300 competency exam at 100% to receive certificate for MNFG 6501/ MNF 2300 from the M-TEC. **NOTE: This is an Open Entry/Open Exit program; however, all credit-bearing students must complete this course in the structured time frame of regular MMCC semester guidelines.
MNF 2400 Print Reading for Residential and Commercial Construction  2
This course is designed to assist students in reading and understanding residential and commercial prints. The text is suitable for vocational students, apprentices, and building trades workers who want to increase their knowledge of construction print reading and composition. The combination text and workbook presents a thorough discussion of print reading techniques, starting with the basics of lines and symbols and then progressing to specialized prints and specifications. The 116 C-sized foldout prints included in this course will enable the student to experience realistic, on-the-job exercises that covers nearly every aspect of print reading.

MUS 131 Music for Elementary Teachers   3(3-0)
This course will prepare elementary teachers for uses and applications of music in the elementary classroom.

MUS 275 Music Appreciation   3(3-0)
This course will promote general musical understanding through active listening.

NAL 101 Ojibwe Language I   3(3-0)
The primary purpose is to introduce the student to the Ojibwe language and to begin to have an understanding of the beauty of the language. This course is designed to acquaint the student with basic words and phrases and stress oral learning. A system of writing will be introduced.

NUR 121 Fundamentals of Nursing   6(6-0)
This is the basic course in the nursing curriculum which provides the beginning nursing students with the foundation upon which other courses build and expand. The course expands on the role of the nurse in the exploration of concepts of communication skills, nursing process, nutrition, wellness and adaptation, and scientific principles and skills of basic nursing practice as applied to common physical and psychosocial manifestations of illness. In addition, the legal and ethical aspects of nursing are discussed. Includes practice of skills in the college laboratory.
Prerequisite: Admission to Level I of the Program
Corequisites: NUR 124, NUR 150

NUR 124 Nursing Clinical I   5(0-15)
A clinical course which consists of guided learning clinical experience in selected health care facilities. Emphasis is placed on application of principles & techniques of basic nursing theory common to the institutionalized patient.
Prerequisite: Admission to Level I of the Program
Corequisite: NUR 121, NUR 150

NUR 125 Care of Adult I   5(5-0)
This course focuses on care of the adult medical-surgical patient with common, well-defined, non-complex stressors. The course uses selected adaptive problems of chronic disease, rehabilitation and aging. Includes use of the three nursing roles (Direct Care Giver, Communicator, and Manager) and nursing process in planning care. Clinical practice in health agencies is included.
Prerequisites: NUR 121, NUR 124, NUR 150
Corequisite: NUR 128

NUR 127 Maternal/Child Nursing   4(3-2)
This course provides concepts of normal growth and development from conception through adolescence focusing on care provided to the mother, infant, child and adolescent with common, well-defined, non-complex nursing diagnoses in a structured setting. The lab portion of this course consists of observational experiences, self study and in-lab clinical simulations. Emphasis is placed on use of nursing skills, patient plan of care and communication techniques with patients throughout the life span for adaptation. Focus is on expansion of knowledge and skills acquired in Nursing 124 to include growth and development, nutrition, drug therapy and variations from normal. Selected adaptive problems are utilized to emphasize the role of the nurse in direct care provision, communication and management of care through the use of the nursing process.
Prerequisites: NUR 121, NUR 124, NUR 150
Corequisites: NUR 125, NUR 128

NUR 128 Nursing Clinical II   4(0-12)
A clinical course which consists of guided learning experiences in selected health care agencies. Emphasis is placed on use of nursing skills, patient plan of care and communication techniques with patients throughout the life span for adaptation. Focus is on expansion of knowledge and skills acquired in NUR 124 to include growth and development, nutrition, drug therapy and variations from normal.
Prerequisites: NUR 121, NUR 124, NUR 150
Corequisites: NUR 125
NUR 130 Nursing Clinical III 3(0-9)
This clinical course focuses on the care of groups of patients with common, well-defined, non-complex nursing diagnoses in structured settings. Included is administration of medication to assigned patients, excluding intravenous initiation and intravenous push medications. Prerequisites: NUR 125, NUR 127, NUR 128

NUR 132 Clinical Practicum 1-6(0-3 to 18)
Additional experience in clinical nursing arranged on an individual basis for students returning to Level I of the Program after having withdrawn.

NUR 133 Transition for Advanced Standing 1(1-0)
This course is designed for the non-MMCC LPN and MMCC LPN who graduated more than 2 years ago to assist in the adaptation to MMCC’s Nursing Process Worksheet (NPW) and evaluation process. Class focuses on the use of the nursing process and communication techniques. Prerequisite: Admission to Level II of the Program with advanced standing status.

NUR 134 – Trends In Leadership 1(1-0)
This course is designed to prepare the Level I graduate to meet the needs of a group of patients by organizing, selecting priorities and delegating nursing responsibilities to unlicensed personnel. The historical perspective to present-day challenges of the nursing role will be discussed. Seeking and maintaining employment as a health care professional will be highlighted, including licensure requirements. Prerequisites: NUR 125, NUR 128 Corequisites: NUR127, NUR 130

NUR 150 Pharmacology 3(3-0)
This course consists of theory and techniques used for legal and safe administration of a variety of types of medication preparations. It includes dosage calculation, understanding of medical abbreviations and nursing interventions used in medication administration. This course identifies prototype medications in each of the major classifications. Emphasis is placed on drug reaction, common usage, major side effects, assessment, administrations, and responsibilities for the safe and accurate administration of medications. Prerequisite: Admission to Level I of the Program Corequisites: First semester Level I Nursing courses unless previously passed.

NUR 221 Family-Centered 2.5(2.5-0)
This course is a continuation of maternal/child nursing in which planning care for patients in relation to concepts of family and child development from conception through adolescence in normal and common disease states is studied. Focuses on the use of principles of bio-psycho-social, spiritual, & developmental and needs theories in planning care for well & ill maternity & pediatric patients. Prerequisite: Admission to Level II of the Program Corequisite: NUR 222

NUR 222 Family-Centered: Clinical IV 2.5(0-7.5)
This clinical course focuses on the use of the nursing process in planning and implementing care for patients in relation to concepts of family and child development from conception through adolescence. Selected health care agencies are utilized for this course. Prerequisite: Admission to Level II of the Program Corequisite: NUR 221

NUR 223 Mental Health 2.5(2.5-0)
This course focuses on selected mental illnesses & mental health interventions including recognition of defense mechanisms, the dynamics of human behavior & therapeutic communications. Students gain further knowledge in relating to patients & increased understanding of their own behavior. Prerequisite: Admission to Level II of the Program Corequisite: NUR 224

NUR 224 Mental Health: Clinical IV 2.5(0-7.5)
This clinical course focuses on the use of the nursing process in planning and implementing care for individuals with mental illness, substance abuse or other mental disabilities. Included is use of communication skills and knowledge of mental health interventions in supporting positive coping behavior. Selected health care agencies are utilized for this course. Prerequisite: Admission to Level II of the Program Corequisite: NUR 223

NUR 225 Care of Adult II 5(5-0)
This course concentrates on acute medical-surgical problems of adult patients in the structured health care setting. Focus is on development of nursing care plans including nutritional therapy, drug therapy, nursing diagnosis & interventions, psychosocial needs, teaching, and referrals. Prerequisite: Admission to Level II of the Program Corequisite: NUR 226
NUR 226 Nursing Clinical V  5(0-15)
This clinical course is a continuation of NUR 130 dealing with adult medical-surgical patients with acute disease condition. Focus is on the development and implementation of the nursing process. Clinical practice is in selected structured health care agencies with observational experience in home care, emergency room, critical care units, cardiac rehabilitation, and hemodialysis.
Prerequisite: Admission to Level II of the Program
Corequisite: NUR 225

NUR 227 Leadership   2(2-0)
This course provides the basics of leadership and management techniques to enable students to provide care to groups of patients. Focus is on the use of the nursing process in planning care for groups. Legal and ethical problems in nursing are explored. Includes concept of role transition from student to graduate and stress management techniques. Students must be enrolled in a clinical concurrently with this class.
Prerequisite: Completion of Semester 1 of Level II of the Program

NUR 228 Preceptorship: Clinical VI   3(0-9)
The clinical portion of the leadership course, the preceptorship is a structured experience which is part of the educational program. The primary goal is to facilitate the role transition of student nurse to graduate nurse. The student nurse, under the guidance of a selected staff, preceptor, with faculty as a resource, applies theory to practice in real-life work situations.
Prerequisites: NUR 221, NUR 222, NUR 223, NUR 224, NUR 225, NUR 226, NUR 227, HUM 200, and SSC 200 (2nd Level Gen Ed)

NUR 232 Clinical Practicum   1-6(0-3 to 18)
Additional experience in clinical nursing. Arranged on an individual basis for students returning to Level II of the Program after having withdrawn.

PED 102 Body Mechanics and Conditioning   1(0-1)
A physical education activity course designed to emphasize the role of exercise in improving general physiological conditions. Aerobic and anaerobic exercises are done and an actual exercise program is set up by the instructor to meet each individual student’s needs.

PED 103 Body Mechanics/Aerobics   1(0-1)
Exercise through choreographed dancing. The course includes an understanding of aerobic exercise, the proper approach to physical fitness, and its effect on tension and better health.

PED 107 Beginning Kardio-Kickboxing   1(0-1)
This course is designed to provide an intense cardiovascular workout utilizing exercise routines with a combination of martial arts and boxing techniques. The intensity and duration of the workouts can be varied to meet individual needs. Instruction and demonstration is provided during class sessions by Tae Kwon Do certified instructors.

PED 108 Beginning Kardio-Kickboxing  1.5(0-1.5)
This course is designed to provide an intense cardiovascular workout utilizing exercise routines with a combination of martial arts and boxing techniques. The intensity and duration of the workouts can be varied to meet individual needs. Instruction and demonstration is provided during class sessions by Tae Kwon Do certified instructors.

PED 109 Beginning Dance Exercise   1.5(0-1.5)
This course utilizes aspects of the following: modern dance, jazz dance, Duncan Dance, martial arts, yoga, and the Alexander Technique. Students will become familiar with their own inner rhythm and dance of fitness. The classes will stimulate, condition and prepare the body through the use of movement forms. This course will utilize the Nia Technique to combine the components listed above, primarily through dance/exercise routines, with very brief periods of verbal instruction.

PED 110 Beginning Body Dynamics   1(0-1)
This course combines elements of cardiovascular and strength training, martial arts movement, Pilates, yoga, and dance into an integrated exercise routine. Through verbal instruction, students will perform movements designed to increase basic physical fitness. Knowledge of life-long fitness practices will also be gained.

PED 118 Beginning Tennis   1(0-1)
This course is designed to introduce the student to the game of tennis. Major emphasis is on basic strokes, scoring, etiquette, and selection of equipment.

PED 119 Beginning Golf   1(0-1)
This course is designed to introduce students to the basic principles of golf. In addition to learning and practicing the golf swing, rules and etiquette of the game are discussed. Students may use their own equipment or rent from the golf facility where the class is held.

PED 124 Beginning Skiing   1(0-1)
This course is designed to introduce students to basic downhill skiing on an established ski resort hill. Students may use their own equipment or rent from the ski resort.
PED 126 Beginning Bowling  1(0-1)
This course is designed to introduce students to the basic game of bowling. Open to all students; a fee is charged for rental of bowling facilities. Students may use their own equipment or rent from the bowling alley where the class is held.

PED 127 Weight Training and Conditioning  1(0-1)
A course in weight training and conditioning for the individual who desires to increase strength and muscle endurance. The course focuses upon the development of each individual muscle and muscle group. Students are required to have hand-held weights and a mat.

PED 130 Slalom Racing  1(0-1)
This course is designed to introduce recreational skiers to competitive skiing. The course includes different types of races such as slalom, giant slalom, and dual slalom. Exercises on skis to develop a good racing technique are used extensively. Proper ski maintenance and tuning are an integral part of the course.

PED 132 Beginning Karate  1(0-1)
This course has been designed to help the participating student understand the art of karate, not only as a method of self-defense but as a 2,000 year old art developed to better-coordinate the body and mind. Emphasis is placed on physical fitness, history of the art, self-discipline, and self-defense. Involved are body-motion principles, a progressive exercise program, and other desirable health and mental aspects of the art of karate.

PED 133 Modern Dance I  1(0-1)
This course includes basic locomotion and aerial movement skills through demonstration and participation, creation of individual routines emphasizing learning skills, and the development of several group routines for public performance.

PED 134 Dance Techniques I  1(0-1)
A course designed to familiarize the student with dance for partners including jitterbug, fox trot, polka, and waltz.

PED 136 Cross-Country Skiing  1(0-1)
Students are introduced to the fundamentals of Alpine cross-country skiing. Students are taught selection and care of equipment, rudimentary ski movement, step-down, moving ahead over snow, controlling speed, wedge turn polling, compass and map reading, and waxing for various snow conditions and temperatures.

PED 139 Introduction to Nordic Ski Racing  1(0-1)
This course is designed to introduce students to cross-country racing. It teaches different types of techniques, equipment, waxing, clothing, and different types of terrain involved in Nordic skiing.

PED 143 Self Defense  1(0-1)
A course designed to teach basic self-defense skills. The emphasis is on environmental awareness, psychological preparedness, simple and effective self-defense techniques, and strategies for dealing with specific situations. Self-defense is approached in a variety of ways, providing a wide range of alternatives to suit the individual.

PED 150 Mind/Body Fitness  .5(0-.5)
This course will utilize the Nia Technique. Neuromuscular Integrative Action – mind body approach to whole body fitness. The Nia Integrative Action – a mind body approach to whole body fitness. The Nia Technique combines Eastern and Western concepts and theories blending martial arts, dance and yoga. Classes are designed to take you through a journey of your own body, introducing you to a new way of moving with the body, mind, spirit and emotions. You will become familiar with your own inner rhythm and dance of fitness. The classes will stimulate condition and prepare your mind and body through the use of movement forms and focused awareness. The course is designed to be taken in conjunction with PED 109, 209, or 253, which are hour long dance exercise sessions. In the half hour following, PED 150 will explore the Nia technique, as described above, through activity and discussion.
Prerequisite: None
Corequisite: PED 109

PED 203 Intermediate Body Mechanics/Aerobics  1(0-1)
A continuation of PED 103 with emphasis on developing increased cardiovascular fitness.
Prerequisite: PED 103 or permission of the Instructor

PED 207 Intermediate Kardio-Kickboxing  1(0-1)
This course is a continuation of PED 107.
Prerequisite: PED 107 or PED 108

PED 208 Intermediate Kardio-Kickboxing  1.5(0-1.5)
This course is a continuation of PED 108.
Prerequisites: PED 107 or PED 108

PED 209 Intermediate Dance Exercise  1.5(0-1.5)
This is the second in a series of courses that utilize aspects of the following: modern dance, jazz dance, Duncan Dance, martial arts, yoga, and the Alexander Technique. Students will become familiar with their own inner rhythm and dance of fitness. The classes will stimulate condition and prepare the body through the use of movement forms. This course will utilize the Nia Technique to combine the components listed above, primarily through dance/exercise routines, with very brief periods of verbal instruction.
Prerequisites: PED 109
PED 210 Intermediate Body Dynamics  1(0-1)
This is the second in a series of courses combine elements of cardiovascular and strength training, martial arts movement, pilates, yoga, and dance into an integrated exercise routine. Through verbal instruction, students will perform movements designed to increase basic physical fitness. Knowledge of life-long fitness practices will also be gained.
Prerequisite:  PED 110

PED 218 Intermediate Tennis  1(0-1)
This course is a continuation of PED 118 with major emphasis shifting to singles and doubles play.

PED 219 Intermediate Golf  1(0-1)
A continuation of PED 119 with emphasis on the use of specific clubs and types of shots, e.g. woods, short irons, chipping, etc.

PED 224 Intermediate Skiing  1(0-1)
Students begin upper/lower body separation leading to steered turns and matching of skis before the fall line is emphasized.

PED 226 Intermediate Bowling  1(0-1)
A continuation of PED 126 with emphasis on spot bowling, consistency, and accuracy.

PED 227 Intermediate Weight Training/Conditioning  1(0-1)
Continuation of PED 127.
Prerequisite:  PED 127

PED 232 Intermediate Karate  1(0-1)
The purpose of this course is to provide students already knowledgeable in the rudiments of the art with the opportunity to gain more substantial expertise in specific aspects of the art. These include self-defense, sport fighting, philosophy, and history.

PED 233 Modern Dance II  1(0-1)
A continuation of PED 133 with emphasis on further development of skills. Appreciation and understanding of contemporary dance as an art form and medium of expression are also included.

PED 236 Intermediate Cross-Country Skiing  1(0-1)
A class intended to expand the basic cross-country skiing skills with emphasis on advanced Nordic skiing techniques.

PED 239 Intermediate Nordic Skiing  1(0-1)
A continuation of PED 139.

PED 243 Adv Body Mechanics/Aerobics  1(0-1)
A continuation of PED 203 with emphasis on increasing knowledge of the use of dance techniques for cardiovascular fitness.
Prerequisite:  PED 203 or permission of the Instructor

PED 244 Advanced Skiing  1(0-1)
Students are introduced to parallel skiing. Exercises to develop upper level dynamic skiing i.e. short radius, fall line skiing is emphasized.

PED 246 Advanced Bowling  1(0-1)
A continuation of PED 226 with emphasis on adjusting the game to alley conditions, changing lines and spots, etc.

PED 247 Advanced Kardio-Kickboxing  1(0-1)
This course is a continuation of PED 207.
Prerequisite:  PED 207 or PED 208

PED 248 Advanced Tennis  1(0-1)
This course is designed primarily to improve a player’s court strategy. The volley net is emphasized.

PED 249 Advanced Golf  1(0-1)
A continuation of PED 219 with emphasis on accuracy, shot placement, selecting the right club, etc.

PED 250 Advanced Kardio-Kickboxing  1.5(0-1.5)
This course is a continuation of PED 208.
Prerequisite:  PED 207 or PED 208

PED 251 Advanced Body Dynamics  1(0-1)
This is the third in a series of courses that combine elements of cardiovascular and strength training, martial arts movement, pilates, yoga, and dance into an integrated exercise routine. Through verbal instruction, students will perform movements designed to increase basic physical fitness. Knowledge of life-long fitness practices will also be gained.
Prerequisites:  PED 110, PED 210

PED 252 Advanced Karate  1(0-1)
This course is designed for the student who has completed PED 232 or who can perform the basic techniques of Moo Duk Kwan Tang Soo Do. Upon completion of the course the student should be prepared to earn an eighth gup purple belt under requirements set forth by the Karate Institute. Emphasis is on forms, hand and foot techniques, one-step sparring, and class sparring.

PED 253 Advanced Dance Exercise  1.5(0-1.5)
This is the third in a series of courses that utilize aspects of the following: modern dance, jazz dance, Duncan Dance, martial arts, yoga, and the Alexander Technique. Students will become familiar with their own inner rhythm and dance of fitness. The classes will stimulate condition and prepare the body through the use of movement forms. This course will utilize the Nia Technique to combine the components listed above, primarily thorough dance/exercise routines, with very brief periods of verbal instruction.
Prerequisites:  PED 209
COURSE DESCRIPTIONS

PED 255 Physical Training  3(0-3)
This course is designed to help students pass the M.C.O.L.E.S. physical training requirements. The objective is to teach the student to become physically and mentally fit to become a police officer.

(PHL) PHILOSOPHY

PHL 201 Introductory Philosophy  3(3-0)
A problem approach organized to introduce the student to some of the thinkers, systems, and problems of philosophy facing humanity from ancient times to the present.

PHL 205 Practical Reasoning & Argumentation 3(3-0)
This course develops reasoning skills & equips students to recognize & analyze arguments as they occur in a variety of contexts (i.e., editorials, critical discussions, quarrels, advertisements, speeches, academic inquiries, negotiations, legal deliberations, ethical debates, etc.). Study will focus on the features of good arguments, different types of arguments, ways arguments can go wrong, & techniques for criticizing & constructing effective arguments. Emphasis is not on theories but on developing tools for successful thinking in dialogue with others.

PHL 210 Social Philosophy: Ideal & Realities  3(3-0)
This course is an inquiry aimed at discovering which questions are the right ones to ask when evaluating a social system or when designing it. It covers several major social philosophies, as reflected in utopian and dystopian writings, and focuses on issues such as human nature, freedom, rights, and obligations, and the relationship between individual and community.

PHL 220 Ethical Issues  3(3-0)
A study of ethical principles, reasoning and practice as it occurs in such areas as business, law, medicine, ecology, and government. A brief review of the historical development of ethical theory together with case studies will be the primary focus of the course. The main objective is to provide students with the intellectual tools for recognizing and analyzing such ethical issues as confront members of our society.

PHL 290-299 Selected Topics  1-3(1 to 3-0)
These courses are designed to investigate various topics in Philosophy that are not included in current courses. Topics will be announced.

(PHT) PHARMACY

PHT 104 Orientation to Pharmacy Technician & Drug Preparations 4(4-0)
This course presents an orientation to the work of pharmacy technicians and the context in which technicians’ work is performed. The concept of direct patient care and the technicians’ general role in delivery with particular emphasis on the complementary roles of pharmacists and technicians is presented.
Corequisites: ALH 100, PHT 105, PHT 106

PHT 105 Pharmacy Law  3(3-0)
This course presents information on the influence that medication laws, standards, and regulations have on pharmacy practice. Federal and State regulations that govern medicine use and standards of practice presented. Laws, regulations and standards which govern the preparation of non-compounded, cytotoxic, and other hazardous medication products is emphasized.
Corequisites: ALH 100, PHT 104, PHT 106

PHT 106 Pharmacy Technician Calculations  3(2-3)
This course presents information on preparing compounded and non-compounded products for distribution. The skills of medication preparation, including retrieval from inventory, profiling, calculations, measuring, and safety procedures are taught. Students learn techniques on compounding cytotoxic and other hazardous medication products and the application of corresponding quality assurance processes.
Corequisites: ALH 100, PHT 104, PHT 105

PHT 113 Institution and Community Pharmacy  3(2-3)
This course presents information on how to assist the pharmacist in institutional and retail pharmacies on the collection, organization, and evaluation of information for direct patient care, medication use review, and departmental management. Communication skills and confidentiality issues are emphasized.
Prerequisites: PHT 104, PHT 105, PHT 106
Corequisite: PHT 114, SPE 101 or SPE 257

PHT 114 Therapeutic Agents for Body Systems & Drug Distribution Systems 4(4-0)
This course presents information on the use and side effects of prescription medications, nonprescription medications, and alternative therapies commonly used to treat diseases affecting the body systems. Students learn the brand and generic names, standard pronunciations, dosage forms, and routes of administration for medications.
Prerequisites: PHT 104, PHT 105, PHT 106
Corequisite: PHT 113, SPE 101 or SPE 257
**COURSE DESCRIPTIONS**

**PHT 115 Clinical Practicum   7.5(0-15)**
This course presents practice skills developed in the didactic and laboratory phases of their training in home care, acute care, and long term care. Knowledge of computer based programs for pharmacy billing and prescription information is implemented at the various places of the clinical practicum. Random drug screen may be performed.
Prerequisites: PHT 113, PHT 114, SPE101 or SPE 257

**PHY 101 Introductory Physics (Non-lab)  3(3-0)**
A general non-mathematical physics presentation stressing a conceptual as opposed to laboratory approach. Some topics of discussion are mechanics, sound, heat, electricity, light, nuclear concepts, and everyday encounter of principles governing these topics. (Not recommended for students majoring in science.)

**PHY 103 Applied Physics    4(3-2)**
This course is designed for students enrolled in technical education programs. The purpose of the course is to provide an understanding of physical principles and their application to industry. The course content includes a study of precision measurements; properties of solids, liquids, and gases; force and motion; work energy and power; vectors; analysis of basic machines; temperatures and heat.
Corequisite: MAT 104 or MAT 170

**PHY 105 Introductory College Physics I    5(4-2)**
This course focuses on the study of motion, forces, energy, sound, wave motion and heat. Students should have had or be currently taking a class in trigonometry.
Corequisite: MAT 124 or equivalent

**PHY 106 Introductory College Physics II   5(4-2)**
Continuation of PHY 105. Topics studied include optics, electricity and magnetism, atomic and nuclear theory and relativity.
Prerequisite: PHY 105

**POL 100 Current Political Issues   1-3(1 to 3-0)**
The purpose of this course is to examine contemporary political issues of local, state, national, or international concern. Typical issues might include: reform of the United States election system; income versus property taxes; local zoning laws; the role of government in the economy; pax Americana.

**POL 201 Intro to American Government   3(3-0)**
The emphasis of this course is the structure and function of our national government, understanding the processes of decision-making, and assessing the political importance and role of the individual citizen. The student is also introduced to some political theory as applicable to the American experience.

**POL 250 International Relations    3(3-0)**
A study of the nature of the international community and the forces which produce cooperation and conflict. Particular attention is given to analyzing power in terms of its acquisition and uses.

**POL 290-299 Selected Topics   1-3(1 to 3-0)**
These courses are designed to investigate various topics in Political Science that are not included in current courses. Topics will be announced.

**PSC 101 Introductory Astronomy    4(3-2)**
An introduction to astronomy for students who desire a basic understanding of the solar system and the universe. Topics include: historical astronomy, exploration of space, stellar evolution, solar system, galaxies, and the universe. Laboratory work includes individual student use of a telescope.

**PSC 102 Introductory Physical Science    4(3-2)**
A general course for non-science majors. Selected topics for students interested in energy, meteorology, geology, physics, and chemistry and their interrelationships as they affect the physical environment of persons.
Prerequisite: MAT 104 or equivalent

**PSC 105 Awareness of Fine Arts, Science, and Society   1(1-0)**
An interdisciplinary study designed to develop the student’s awareness of the interrelationships of the artistic, scientific, and technological aspects of our society and investigate their impact upon contemporary society from a variety of perspectives. Various methods of instruction may be used for this course including independent readings or research, lecture and discussion, projects associated with a field trip, or travel of recognized educational value.
**COURSE DESCRIPTIONS**

**PSY) PSYCHOLOGY**

**PSY 101 Intro to General Psychology  3(3-0)**
This class introduces students to the specific discipline of psychology. This course will include a comprehensive coverage of basic concepts and principles, terminology, important trends in psychological research, and the application of this research. Emphasis will be placed on contemporary perspectives of psychology, including biological, learning, cognitive, sociocultural, psychodynamic, and humanistic perspectives in understanding normal and abnormal behavior and mental processes.

**PSY 205 Abnormal Psychology  3(3-0)**
This course introduces students to abnormal psychology issues, including the criteria, nature, development, classification and causes of mental disorders. Perspectives from each of the major contemporary perspectives in psychology will be included. In addition, major theories, significant research, and methods of treatment associated with each of these approaches are presented.
Prerequisite: PSY 101

**PSY 212 Developmental Psychology  3(3-0)**
This course introduces students to the description and explanation of changes in an individual’s behavior that are a result of maturation and experiences that fall within the life span concept; e.g. behavior-genetics, critical periods, learning cognition, and abnormal development. In addition, this course provides the student with an introduction into methodological research.
Prerequisite: PSY 101

**PSY 220 Intro to Psychological Testing  3(3-0)**
This course is designed to introduce the student to the basic principles of psychological testing. The course will cover the history of psychological testing, assessment in a variety of areas including intelligence testing, personality assessment, neurological assessment, and vocational assessment, and issues relating to test development and review.
Prerequisite: PSY 101

**PSY 240 Theories of Personality  3(3-0)**
This course presents issues in the measurement & research of personality. Historical & contemporary theories and theorists from each of the major domains of psychology will be critically examined regarding each of the domains’ emphasis on development and assessment of personality. Application of course material will be emphasized.
Prerequisite: PSY 101

**PSY 250 Clinical Interviewing & Counseling  3(3-0)**
This course is an introduction to theories of counseling as well as the techniques and processes of client and counselor communication. Students explore attitudes, values, and motivation for counseling. Emphasis is placed on the role of the counselor in various agency capacities as well as the development of empathetic and listening skills.
Prerequisite: PSY 101 or permission of the Instructor

**PSY 281 Behavior Modification  3(3-0)**
This course is an introduction into a survey of developments in behavior alteration. Specifically, emphasis is on behavior modification techniques in the areas of motivation, elimination of undesirable behaviors, an increase of desirable behaviors, and the promotion of academic and social participation in education and other environments.
Prerequisite: PSY 101

**PSY 285 Research Methods  3(3-0)**
This course provides an introduction to research methods in the social sciences. Research designs, data collection methods, basic statistical procedures, and ethical issues in research will be included. An APA-style research proposal will be completed.
Prerequisite: PSY 101, MAT 212

**PSY 290-299 Selected Topics  1-3(1 to 3-0)**
These courses are designed to investigate various topics in Psychology that are not included in current courses. Topics will be announced.

**(PTA) PHYSICAL THERAPIST ASSISTANT**

**PTA 101 Orientation to Physical Therapy  1(1-0)**
This introductory course provides an overview of the profession of physical therapy and focuses upon the role of the physical therapist assistant. Standards of Practice and core values of professionalism are emphasized. Communication skills are enhanced to better serve a multicultural health care environment.
Prerequisite: Admission to the Program
Corequisite: PTA 105, PTA 106, PTA 110, PTA 111, PTA 115, PTA 116

**PTA 105 Modalities I  1(1-0)**
This course includes instruction in the principles, indications, contraindications and precautions of physical agents including heat and cold treatments, hydrotherapy and ultrasound.
Prerequisite: Admission into the Program
Corequisite: PTA 101, PTA 106, PTA 110, PTA 111, PTA 115, PTA 116
PTA 106 Modalities I Lab  2(0-6)
This lab is coordinated with the lectures and demonstrations presented in Modalities I. Guided practice with physical agents is provided. Students gain hands-on experience with heat and cold treatments, hydrotherapy and ultrasound. Basic documentation skills are introduced.
Prerequisites: Admission into the Program
Corequisites: PTA 101, 105, 110, 111, 115 & 116

PTA 110 Therapeutic Exercise   1(1-0)
Basic exercise theory is presented. Concepts of flexibility, strength and coordination are emphasized. Other topics include transfers, documentation, gait training with amputation equipment and monitoring a patient/client during an exercise or gait training program.
Prerequisites: Admission into the Program
Corequisites: PTA 101, 105, 106, 110, 111, 115 & 116

PTA 111 Therapeutic Exercise Lab   2(0-6)
In a lab setting, students practice basic therapeutic exercise techniques. They implement flexibility, strength and coordination programs. Progress note writing is also required.
Prerequisites: Admission into the program
Corequisites: PTA 101, 105, 106, 110, 111, 115 & 116

PTA 115 Clinical Kinesiology   1(1-0)
This course provides a review of surface and functional anatomy with an emphasis on the muscles, bones and joints. Students develop an understanding of normal posture, movement patterns and gait.
Prerequisites: Admission into the Program
Corequisites: PTA 101, 105, 106, 110, 111 & 116

PTA 116 Clinical Kinesiology Lab   1(0-3)
This lab course accompanies Clinical Kinesiology and provides practical observation, palpation and identification skills of basic anatomical landmarks, especially bones, joints and muscles. Normal posture, movement patterns and gait characteristics are included.
Prerequisites: Admission into the Program
Corequisites: PTA 101, 105, 106, 110, 111 & 115

PTA 125 Measurement Techniques   1(1-0)
Students are presented with the assessment techniques most commonly used in physical therapy. Treatment plans are based upon the objective findings of this data collection. Techniques of goniometry, muscle testing, sensory assessments, gait/posture analysis and coordination testing are presented.
Prerequisites: PTA 101, 105, 106, 110, 111, 115, & 116
Corequisites: PTA 126, 130, 131, & 140

PTA 126 Measurement Techniques Lab   2(0-6)
Lab practice is the follow-up to Measurement Techniques. Students received guided practice with the assessment techniques of goniometry, muscle testing, sensory evaluations, gait/posture analysis and coordination testing.
Prerequisites: PTA 101, 105, 106, 110, 111, 115 & 116
Corequisites: PTA 125, 130, 131, & 140

PTA 130 Advanced Therapeutic Exercise   2(2-0)
This course presents the principles and guidelines for treating musculoskeletal conditions (surgical and non-surgical) of the upper and lower extremities, neck and back. Other therapeutic exercises will be provided for vascular disorders and faulty posture.
Prerequisites: PTA 101, 105, 106, 110, 111, 115 & 116
Corequisites: PTA 125, 126, 131, & 140

PTA 131 Advanced Therapeutic Exercise Lab   2(0-6)
This lab course reinforces the principles and guidelines for treating musculoskeletal conditions (surgical and non-surgical) of the upper and lower extremities, neck and back. Students are guided in implementing therapeutic exercises for those conditions as well as additional exercises for vascular disorders and faulty posture. Previous course information about basic therapeutic exercise and modalities is integrated into lab sessions.
Prerequisites: PTA 101, 105, 106, 110, 111, 115, & 116
Corequisites: PTA 125, 126, 130, & 140

PTA 140 Clinic I   4(0-16)
Part-time (two full days/week) clinical practice offers students opportunities to observe, assist with and implement treatment techniques which have been introduced in prior lecture courses and practiced in lab. Clinical instructors facilitate learning and supervise. Clinical placements occur in hospitals, outpatient clinics, rehabilitation centers, nursing homes, home care or schools.
Corequisites: PTA 125, 126, 130, & 131

PTA 205 Modalities II   2(2-0)
The basic concepts, terminology and physiology of electrical stimulation are introduced. The course guides the student in understanding treatment parameters/protocols and the safe management of equipment for pain control, edema/swelling reduction, muscle spasm relief and strengthening.
Prerequisites: PTA 125, 126, 130, 131 & 140
Corequisites: PTA 206, 207, & 208
PTA 206 Modalities II Lab  
This lab provides practice in the safe and effective delivery of electrical stimulation. The students use a variety of modalities for decreasing pain, increasing strength, reducing edema/swelling, and improving tissue repair. Documentation skills are reinforced.
Prerequisites: PTA 125, 126, 130, 131 & 140
Corequisites: PTA 205, 207 & 208

PTA 207 Rehabilitation of Pathological and Neurological Conditions  
The signs, symptoms, etiology, prognosis and medical treatment of diseases and conditions are presented. The focus is upon diagnoses commonly seen in physical therapy.
Prerequisites: PTA 125, 126, 130, 131 & 140
Corequisites: PTA 205, 206 & 208

PTA 208 Rehabilitation Techniques Lab  
Rehabilitation treatments are practiced for common pathological and neurological conditions. Students also gain hands-on experience with orthotics, prosthetics, adaptive equipment and custom fitted wheelchairs.
Prerequisites: PTA 125, 126, 130, 131 & 140
Corequisites: PTA 205, 206 & 207

PTA 210 Clinical Forum  
This seminar course offers networking with classmates and instructors to solve clinical problems, improve communication skills, and reinforce professional behavior. Emphasis is on evidence-based clinical decision making, ethical practice, planning for future employment, and professional growth.
Prerequisites: PTA 205, 206, 207 & 208
Corequisites: PTA 240

PTA 240 Clinic II  
Full-time clinical assignments provide a broad range of practice opportunities with patient/clients. Students will be assigned to hospitals, outpatient centers, nursing homes, schools or rehabilitation centers for 40 hours/week for 12 weeks. The students are under the direct supervision of a clinical instructor (physical therapist or physical therapist assistant.)
Prerequisites: PTA 205, 206, 207, 208, and a current CPR Certificate for the Health Care Provider or an AED/CPR Certificate for the Professional Rescuer.
Corequisites: PTA 210

RAD 100 Intro to Radiologic Technology  
This course is an introduction to the radiologic technology profession. Areas of study include the history of medicine, development of the practice of radiology and radiologic technology, medical relationships and ethics, principles of radiographic exposure, fundamentals of x-ray production, and principles of x-ray film processing. Practice in the fundamentals of equipment operation and film processing in the Campus x-ray lab provide the basis for developing initial psychomotor skills necessary to function as a radiologic technologist.
Prerequisite: Admission to the Program

RAD 101 Intro to Radiologic Technology Independent Study  
This course is part of a series of courses to be offered on an independent study basis for students who have previously passed the corresponding MMCC Radiography Program course or its equivalent and require a refresher or remedial course for the purposes of reentering or seeking advanced placement in the Radiography Program, or requalifying for the American Registry of Radiologic Technologists examination. The course is an introduction to the Radiologic Technology profession. Subject areas studied are the introduction of the following topics: hospital and Radiology department organization, professional organizations, medical legal issues and ethics, use of basic x-ray equipment and accessories with emphasis on the prime factors, pathology and effect of density, beam restricting devices, grids, film processing, quality assurance, sensitometry, and intensifying screens.
Prerequisites: All Radiography Program prerequisites or equivalent, and RAD 100 or equivalent with a grade “C” or better.

RAD 110 Radiation Physics  
This course correlates the basic concepts and principles of physics with the production, control, and application of x-radiation. The focus is on the study of the structure of matter, mechanical principles, electricity, and magnetism as related to the development and application of x-ray machinery. The measurement and detection of radiation and laboratory exercises in electrodynamics supplement the principles and concepts.
Prerequisite: Admission to the Program
RAD 111 Radiation Physics (Ind. Study) 3(0-1 to 3)
This course is part of a series of courses to be offered on an independent study basis for students who have previously passed the corresponding MMCC Radiography Program course or its equivalent and require a refresher or remedial course for the purposes of reentering or seeking advanced placement in the Radiography Program, or requalifying for the American Registry of Radiologic Technologists examination. The course reviews units of measurement, forces, motion, electrostatics, magnetism, basic electrical circuits, and introductory concepts in atomic and nuclear physics. It also reviews x-ray production and interaction of x-rays with matter.
Prerequisites: All Radiography Program prerequisites or equivalent, and RAD 110 or equivalent with a grade “C” or better.

RAD 115 Principles of Radiographic Exposure 3(2-2)
A study of the prime factors in radiographic techniques determination, the geometric and photographic basis of radiographic image formation, and how these relate to radiographic quality. Methods of technical conversions for adjusting radiographic technique to maintain radiographic quality are studied. An overview of the different systems of radiographic techniques is presented and students learn how to formulate a radiographic technique system.
Prerequisite: Successful completion of the first semester RAD courses.

RAD 116 Principles of Radiographic Exposure-Review 1(0-1)
This course is part of a series to be offered on an independent study basis for students who have previously passed the corresponding MMCC Radiography Program course or its equivalent. Students taking this course require a refresher or remedial course for the purposes of reentering or seeking advance placement in the Radiography Program, or re-qualifying for the American Registry of Radiologic Technologists examination. The course is a study of the prime factors in radiographic technique determination, and how these factors relate to radiographic image quality factors. Conversion methods for adjusting radiographic technique to maintain radiographic quality are studied. An overview of radiographic techniques is presented, and students learn how to formulate a technique chart. Also studied are, mobile radiography, image intensification, tomography, and digital radiography.
Prerequisite: RAD 115 or equivalent

RAD 130 Radiographic Positioning I & II 4(2.5-2.5)
Introduction to radiographic positioning fundamentals, terminology and procedures. The fundamentals of patient care are integrated with the study of the basic radiographic procedures of the thorax, abdomen, upper and lower extremities, shoulder, pelvis, and spinal column. Practice of the basic skills required in these procedures is done in the Campus x-ray lab.
Corequisite: RAD 115

RAD 175 Radiographic Positioning III 3(1-5)
A continuation of the fundamentals of radiographic positioning procedures and patient care. Principles of the use of contrast media in radiology are correlated with positioning procedures of the gastrointestinal, urinary, and biliary systems. Adaptation of routine radiographic procedures to mobile and operative radiographic situations is introduced. Practice in the x-ray and nursing labs permit the development of basic skills needed to perform the procedures. A one day a week clinical laboratory schedule orients the student to the hospital and the radiology department operations.
Prerequisite: Successful completion of all 2nd semester RAD and Science courses.

RAD 176 Radiographic Positioning - Review 1(0-1)
A combined review of radiographic positioning and patient care procedures. The study of the fundamentals of patient care and handling is integrated with study of the basic radiographic procedures of the thorax, abdomen, upper and lower extremities, pelvic girdle, spinal column, cranium, facial bones, sinuses, upper gastrointestinal system, lower gastrointestinal system, gall bladder and biliary ducts, urinary system, mammary gland, pediatric radiography, tomography, arthrography, and myelography. Practice of the basic skills required in these procedures may take place in the campus x-ray lab. If the student needs to practice at MMCC, a mutually agreeable time can be arranged. A cumulative final will be given at MMCC following successful completion of review materials and satisfactory demonstration of positioning competency. Fifteen to twenty competencies will be performed depending on skill level demonstrated.
Prerequisite: RAD 130, RAD 175 or equivalent
RAD 200 Clinical Education I  8(0-32.4)
The first phase of clinical practicum in the hospital environment. The students review the hospital organization and operation, become familiar with hospital policies and procedures and are introduced to and integrated into the Radiology Department operations. Opportunity to develop and perfect the initial skills needed to function as a radiologic technologist is scheduled, and the basic radiographic procedures are practiced and assessed. Student film conferences are conducted and pertinent clinical issues are discussed. This course will meet for 19 weeks.
Prerequisite: Successful completion of all first-year requirements.
Corequisites:  RAD 201, RAD 215

RAD 201 Clinical Issues in Radiography I  2(2-0)
This course is the first in a series of courses intended to augment first year introductory courses and complement clinical education. Topics covered are medical legal issues, medical ethics, communication in radiology, and critical thinking/problem solving in radiography. In addition, students evaluate selected radiographs taken during clinical education. A semester project integrating didactic concepts with clinical education is conducted. Review is begun for the American Registry of Radiologic Technologists examination.
Prerequisite:  RAD 175
Corequisite:  RAD 200

RAD 214 Review of Radiation Protection, Radiobiology, and Quality Assurance  1(0-1)
This course is part of a series to be offered on an independent study basis for students who have previously passed the corresponding MMCC Radiography Program course or its equivalent. Students taking this course require a refresher or remedial course for the purposes of reentering or seeking advanced placement in the Radiography Program, or re-qualifying for the American Registry of Radiologic Technologists examination. The course provides a review of the basic principles of radiation protection, radiobiology, and quality assurance.
Prerequisite:  RAD 215, RAD 230 or equivalent

RAD 215 Radiologic Techniques I  2(2-0)
Advanced study of the application of radiation and its effects. Areas of concentration are on biological effects of ionizing radiation, principles of radiation protection, and practical applications of radiation protection in the clinical situation. Laboratory exercises and experiments utilizing low-level radiation sources, radiation-measuring instruments and biological specimens in the microbiology lab provide the student observable evidence of ionizing radiation effects.
Prerequisite:  RAD 175
Corequisite:  RAD 200

RAD 216 Radiation Protection, Radiobiology, and Quality Assurance Review  1(1-0)
This course is part of a series of independent study courses for students requiring remediation or refresher courses for the purpose of re-entering or seeking advanced placement in the Radiography Program or for re-qualifying for the American Registry of Radiologic Technologists examination.
Prerequisites: Associate Degree in Radiography from an Joint Review Committee on Education in Radiologic Technology accredited program.
Corequisites:  RAD 101

RAD 217 Radiologic Techniques II  2(2-0)
A continuation of advanced study in radiologic technology. Radiographic procedures and imaging methods used to demonstrate special anatomical areas or systems are investigated. The pathological processes that necessitate radiological investigation are introduced and correlated with their diagnostic manifestation on the imaging format utilized.
Prerequisites:  RAD 200, RAD 201, RAD 215
Corequisites:  RAD 220, RAD 221

RAD 218 Radiographic Special Procedures and Pathology Review  1(1-0)
This course is part of a series of independent study courses for students requiring remediation or refresher courses for the purpose of re-entering or seeking advanced placement in the Radiography Program of for re-qualifying for the American Registry of Radiologic Technologists examination.
Prerequisites: Associate Degree in Radiography from an Joint Review Committee on Education in Radiologic Technology accredited program.
Corequisites:  RAD 101

RAD 220 Clinical Education II  9(0-32.8)
The second phase of clinical practicum in the hospital environment provides the opportunity for the student radiologic technologist to develop and perfect the skills to function as a radiologic technologist. Additional radiographic procedures are practiced and assessed. Student film conferences are again conducted. This course will meet for 20 weeks.
Prerequisite:  RAD 215

RAD 221 Clinical Issues in Radiography II  1(1-0)
This course is the second in a series of courses that augment clinical education. In addition to film conference and registry review, topics covered are medical ethics, career planning, and resume writing. A semester project related to clinical education is assigned.
Prerequisites:  RAD 200, RAD 201
Corequisites:  RAD 220, RAD 217
RAD 224 Principles of Radiographic Exposure 5(0-5)
This course is part of a series to be offered on an independent study basis for students who have previously passed the corresponding MMCC Radiography Program or its equivalent. Students taking this course require a remedial course for the purpose of requalifying for the American Registry of Radiologic Technologists examination. The course consists of a clinical education experience in which the student can perform radiographic procedures for the purposes of clinical competency testing. This course may be taken as an unpaid internship or as part of employment as a graduate but unregistered technologist.

RAD 225 Clinical Education III 5(0-33.3)
The final phase of clinical practicum in the hospital environment designed to perfect the basic skills and develop the fundamental skills in more technically-exacting procedures. Remaining entry-level procedures are assessed, and student film conferences are conducted. This course will meet for 12 weeks.
Prerequisites: RAD 217, RAD 220

RAD 226 Clinical Issues in Radiography III 1(1-0)
This course is a third in a series designed to augment clinical education. Included in this course is a capstone component that requires successfully completing a simulated registry examination. Other topics include interviewing skills and continuing education professional requirements.
Prerequisites: RAD 220, RAD 221
Corequisite: RAD 225

RAD 227 Radiography Review Series Capstone 1(0-1)
This course is part of a series to be offered on an independent study basis for students who have previously completed a Radiography Program accredited by the Joint Review Committee on Education in Radiologic Technology. Students taking this course require a refresher or remedial course of study in order to re-qualify for the American Registry of Radiologic Technologists examination. The course primarily provides a review of all basic concepts on Radiography, as contained in the primary textbook. Other topics covered are preparation for review, American Registry of Radiologic Technologists examination procedure, and test-taking skills. As a capstone feature, students are required to take two simulated registry examinations, and must pass (75%) at least one of them.
Prerequisites: RAD 101, RAD 111, RAD 116, RAD 176
Corequisite: RAD 214

RAD 230 Radiographic Quality Assurance 1(1-.5)
The course introduces the student to the principles, concepts, instrumentation, and testing methods used in radiology departments for quality control of the radiographic imaging system(s). Practice in the fundamentals of quality-control testing methods on the imaging system components is done in the Campus x-ray lab. Elements of a department wide quality assurance program are discussed.
Prerequisite: RAD 220
Corequisite: RAD 225

RAD 240 Radiographic Review and Refresher 1-6(1 to 6-0)
A review and/or update course for practicing radiographers or for those who have not been practicing for a period of time. The content is mutually agreed upon by the individual students and program coordinator. The design and methods of implementation of the course are developed by the program coordinator and a contract is drawn up specifying the content, objective, time frame, credit hours, and requirements. The emphasis of the content is tailored to the needs of the individuals with emphasis placed on effective allocation and utilization of available resources to achieve the objectives established.

(REL) RELIGION

REL 111 Introduction to Religion 3(3-0)
Major forms of world religions, religious activity, and experience studied as an essential element of human life. Dimensions of the academic study of religion covered include myth, meaning, ritual, symbolism, traditions, religious social institutions, comparative religious study, the sacred, civil religion, religious art, and the social creation of moral ideologies.
Prerequisites: none

REL 290-299 Special Topics in the Academic Study of Religion 3(3-0)
These courses are designed to investigate various topics in Religion that are not included in current courses. Topics will be announced.
SCI 200 Science, Technology & Society  3(2-2)
This course is designed to introduce students from a variety of programs to the sciences. This introduction will focus on the way science and technology impacts each person’s everyday life and their particular role in the environment. Knowledge will be gained for individuals to achieve scientific literacy sufficient to understand public issues. The course will stress interaction through student presentations and student-led discussions.
Prerequisites:  Level I General Education courses (CIS 100, ENG 111, MAT, SPE 101 or SPE 257)

SCI 290-299 Selected Topics  1-5(1 to 4-0 to 3)
These courses are designed to investigate various topics in Science that are not included in current courses. Topics will be announced.

(SOC) SOCIOLOGY

SOC 101 Principles of Sociology  3(3-0)
This course discusses the principles governing relationships among human beings & the organization of human societies. Primary emphasis on contemporary American society with integration of classical theories of sociology.

SOC 105 Awareness of Fine Arts/Science/Society  1(1-0)
An interdisciplinary study designed to develop the student’s awareness of the interrelationships of the artistic, scientific, and technological aspects of our society and investigate their impact upon contemporary society from a variety of perspectives. Various methods of instruction may be used for this course, including independent readings or research, lecture and discussion, projects associated with a field trip, or travel of recognized educational value.

SOC 200 Contemporary Social Problems  3(3-0)
This course identifies the factors and issues in humanity’s quest of a high quality of life in a changing technological society. The nature, extent, and consequences of major social problems are examined in terms of underlying social processes as well as specific factors.
Prerequisite:  SOC 101 recommended

SOC 220 Sexuality and Society  3(3-0)
This course analyzes the impact of society on sex and sexuality. Emphasis is on interpersonal relationships and factual information necessary to enable students to understand better their own sexuality. Topics including sex roles, sexual interaction, sexual physiology, and public issues related to sex are discussed utilizing contemporary research and cultural definitions.
Prerequisite:  SOC 101 recommended

SOC 222 Juvenile Delinquency  3(3-0)
This course provides the student with a concentrated overview of theory and research in the field of juvenile delinquency. Students will review research findings on various aspects of juvenile delinquency, of the characteristics of young offenders, and of the results of different forms of judicial and therapeutic interventions designed to prevent or control delinquent activities.
Prerequisite:  SOC 101

SOC 250 The American Family  3(3-0)
This course analyzes the development of the family as a contemporary social-institution. Factors which influence the makeup, stability, and the cultural and interpersonal contributions of the modern American family are discussed.

SOC 289 Gender Studies  3(3-0)
This course is an analysis of the impact of gender throughout the social world. The impact of gender in social institutions, cultural definitions, & interpersonal relationships will be explored. Gender inequality & its reproduction will be a focus. Emphasis will be on the relationship of gender to other aspects of social location and diversity.
Prerequisite:  SOC 101 recommended

SOC 290-298 Current Topics / Sociology  1-3(1 to 3-0)
Courses designed to investigate current topics of sociological relevance not included in courses currently listed. Topics will be announced.

(SPE) SPEECH

SPE 101 Fund of Communication  3(3-0)
A basic course in interpersonal communication & public speaking. Through observation, presentation, games, role play, valuing, & personal encounter, the student learns to encode & receive messages, verbal & nonverbal, with confidence & empathy. Skills in perception & concentration are emphasized.

SPE 105 Basic American Sign Language  3(2-2)
This course is designed to give students a basic introduction to American Sign Language which includes signing and finger spelling, expressive and receptive, and information about deaf culture and different sign systems.
SPE 121 Listening Skills 2(2-2)
A course designed for study and practice in the development of effective listening skills.

SPE 195 Intercultural Communication 3(3-0)
This course introduces the student to the field of intercultural communication, emphasizing the way in which culture influences perception of your “self” and others and the manner in which it affects communication behaviors and expectations. In addition, this course provides an opportunity to explore other cultures, heighten cultural awareness and sensitivity, and develop communication skills to successfully negotiate through diverse cultural experiences. In that “culture” refers not only to national differences, but to differences of all types (e.g., values, gender, race, communication patterns), this course will focus on the way we can manage the differences between ourselves and others in a mutually satisfying manner.

SPE 205 Basic American Sign Language II 3(2-2)
Continuation of SPE 105. This course increases the student's receptive and expressive skills while continuing to provide information and knowledge of deaf culture.
Prerequisite: SPE 105 or permission of the instructor

SPE 215 Basic American Sign Language III 3(2-2)
This course continues to increase students' sign vocabulary and knowledge of the grammatical structure of American Sign Language (ASL). English and ASL idioms are explored, as well as additional uses of classifiers. Students will begin to develop skills in changing English text to ASL.

SPE 225 Basic American Sign Language IV 3(2-2)
This course will build upon previously learned American Sign Language (ASL) vocabulary, grammar, and structure. Students will continue to increase their understanding of and correct use of ASL. Special emphasis will be placed on developing skills in signing English texts in ASL.
Prerequisite: SPE 215

SPE 251 Foundations of Communication 3(3-0)
This course concerns itself with theories and research in the field of human communication. There will be three segments to this course. The first will consider preliminary issues of definitions of communication and theory and broad theoretical approaches to communication. The second will consider theories specific to elements of the communication process (such as persuasive outcomes and verbal/nonverbal behaviors). The final segment will focus on context-specific theories.
Prerequisite: 9 hours of SPE completed

SPE 253 Small Group Communication 3(3-0)
This course examines the major concepts, principles, and theories associated with human communication behavior in small groups and provides practice with effective group communication skills. This course will enable you to be better able to analyze and evaluate your own participation in groups and to engage in competent communication practices in the group context. Since both interpersonal processes and problem-solving features of groups are important determinants of the group’s overall effectiveness, this course will focus on both these areas.

SPE 257 Public Speaking 3(3-0)
This course is designed to build and refine the student's overall communication skills, with special emphasis given to public speaking contexts. Students will examine theories and techniques for creating public speaking and apply these principles in class activities.

SPE 261 Interpersonal Communication 3(3-0)
This course is designed to build and refine the student's interpersonal communication skills. Special emphasis will be given to understanding how relationships form and the role of communication in initiating, maintaining, and terminating relationships. Students will examine and develop skills in interpersonal communication for both personal and professional contexts. Although the central theme of the course will remain consistent for all students, assignments and communication activities will be adapted to each student’s chosen professional emphasis.

SPE 263 Professional Interviewing 3(3-0)
This course is designed to build and refine the student's overall communication skills, with special emphasis given to various professional interviewing situations (employment, counseling, etc.). Students will examine the concepts and theories relevant to interview communication practices, apply these principles to communication issues and problems encountered in interview situations, and, through continued practice, set and achieve goals essential to preparing for and conducting successful interviews. Although the central theme of the course will remain consistent for all students, assignments and communication activities will be adapted to each student’s chosen professional emphasis.

SPE 264 Organizational Communication 3(3-0)
This course is designed to introduce the student to the current theories and practices relevant to the management of communication systems in formal organizations and provide the student with a practical understanding of organizational communication.
### SPE 265 Theories of Persuasion   3(3-0)
This course is structured to give the student an understanding of persuasion theory and how it functions within society. Specifically, this course will focus on the principles of attitude formation and change, its relationship to behavioral outcomes, and the role of communication in actuating those outcomes.

### SPE 267 Nonverbal Communication   3(3-0)
This course is designed to increase awareness of the different concepts and theories associated with nonverbal communication and to allow the student to improve skills in this area of communication. Throughout the course, students will examine the different elements which make up the nonverbal message system and, within each area, talk about some of the current social and communication issues relevant to today's world.

### SPE 270-279 Special Topics in Communication   1-6(1 to 6-0)
Variable topics/credit course designed to address special issues and/or employ innovative teaching techniques in the study of communication.  
Prerequisite: Permission of the Instructor

### SPE 285 Directed Activities in Forensic   1-3(0-1 to 3)
This course is designed to build and refine the student's overall communication skills, with special emphasis given to public speaking contexts and interactions that go beyond those traditionally available in a classroom setting. Students may choose to compete (at the local, state, and/or national level) in debate, individual events (persuasive speaking, impromptu speaking, etc.), or both. Students will participate in forensics activities as part of the Central Michigan University Forensics Team.  
Prerequisite: Permission of the Instructor

### SPE 290 Internship in Communication Studies   1-3(.25 to 1 - 3.25 to 10)
This course is designed to provide the student with "real world" experience in which to apply the knowledge and skills he/she has developed in studying communication. With an advisor, the student will arrange to work with an organization for college credit. The student will be expected to participate and process his/her experience with both the college advisor and the organizational supervisor. Students must obtain application forms and internship guidelines from the Chair of the Communication Studies program.  
Prerequisite: Permission of Chair of the Communication Studies program.

### (SPN) SPANISH

#### SPN 101 Elementary Spanish I   4(3-1)
This course is designed to introduce students to basic conversational Spanish. It emphasizes essential grammar and touches on Hispanic culture since culture is an essential part in learning a new language. Student should, upon course completion, have the ability to speak, write, and understand basic Spanish conversation.

#### SPN 102 Elementary Spanish II   4(3-1)
Spanish 102 continuation of SPN 101; therefore, it will begin with a review of the material covered in Spanish 101. Students in Spanish 102 will continue the study of grammar and vocabulary and will use these to communicate utilizing speaking, writing, listening, and reading skills. The course is designed to provide the basis for further study of Spanish at an intermediate level. Students are expected to study the material outside of class and come to class prepared to participate.  
Prerequisite: SPN 101 or equivalent or 1 year of high school Spanish.

#### SPN 201 Intermediate Spanish I   4(4-0)
Spanish 201 is a course designed to help students in the acquisition of language skills necessary for verbal communication, grammar, reading, and writing at the intermediate level in Spanish. Cultural themes of the Hispanic world will be discussed in order to have a better cultural understanding.  
Prerequisite: SPN 102 or equivalent course, or 2 years of High School Spanish.

### (SSC) SOCIAL SCIENCE

#### SSC 100 Career Planning   2(2-0)
This participatory course is designed to assist students in developing life planning skills to enable them to make informed choices for career and life. The course focuses on self-awareness and assessment; academic planning; and career awareness, exploration, decision-making, and planning.  
**NOTE:** This course does not satisfy Group III requirements.

#### SSC 101 Personal Development   2(2-0)
Introduction to the development of home management, parenting skills, and consumer-skill knowledge.  
**NOTE:** This course does not satisfy Group III requirements.
SSC 106 Employment Training Skills 1(1-0)
The goal of this course is to develop and master all skills necessary to secure employment. Topics covered include skill identification, resume writing, job-seeking skills, job-seeking plan, interviewing techniques, applications, letter of application, thank-you notes, and successful job behaviors. It is recommended that students enroll in this course the semester prior to employment. This course does not satisfy Group III requirements for graduation.

SSC 111 Introduction to the Academic Study of Religion 3(3-0)
Major forms of world religions, religious activity, and experience studied as an essential element of human life. Dimensions of the academic study of religion covered include myth, meaning, ritual, symbolism, traditions, religious social institutions, comparative religious study, the sacred, civil religion, religious art, and the social creation of moral ideologies.
Prerequisites: none

SSC 190-199 Special Topics/Social Science 1-3(1 to 3-0)
Special Topics is a course designed to present various topics in Social Science that are not included in current courses. Topics will be announced. This course is offered based on demand and does not satisfy Group III requirements for graduation.

SSC 200 The Social Sciences & Contemporary America 3(3-0)
This course will introduce each of the various social sciences and demonstrate their respective and unique perspectives on the human experience. It will also endeavor to help the student to understand the scientific method of inquiry and its advantages, as well as other ways of knowing. Finally, through a thematic approach, the student will seek to apply the various social science perspectives to illuminate understanding of his/her world.
Prerequisites: Level I General Education courses (CIS 100, MAT, ENG 111, SPE 101 or SPE 257)

TAI 204 Theatre - Musical 3(3-0)
Discussion of musical theatre including all aspects of a production. A musical production is included as part of the course.

TAI 205 Children’s Theatre 3(3-0)
Discussion of theatre for children including all aspects of a production. A children’s theatre production is included as part of the course.

TAI 206 Theatre - Mystery 3(3-0)
Discussion of mystery as a form of theatre including all aspects of a production. A mystery production is included as part of the course.

TAI 207 Theatre - Comedy 3(3-0)
Discussion of comedy theatre including all aspects of a production. A comedy production is included as part of the course.

TAI 208 Theatre - Serious Drama 3(3-0)
Discussion of serious drama including all forms of tragedy. A serious dramatic production is included as part of the course.

TAI 275 Appreciation of the Theatre 3(3-0)
A survey of theatre history and an introduction to basic types of plays; concepts of professional and amateur; and principles of play selection, casting, and promotion are covered in this course.

TAI 277 Stagecraft and Stagelighting 4(4-0)
This course includes the basic principles of scenery construction and the theory and practice of stage lighting.

TAI 287 Costuming 3(3-0)
This course is a survey of costume history, Egyptian to the present, and includes an introduction to design and construction techniques.

WLD 126 Basic Welding I 3(2-2)
Fundamentals of oxyacetylene brazing, oxyacetylene cutting, oxyacetylene welding, arc welding, MIG welding, and TIG welding are included in this course. Emphasis is placed on penetration welds in the flat position.

WLD 127 Basic Welding II 3(2-2)
Fundamentals of oxyacetylene brazing, cutting, arc welding, and MIG welding are included in this course. Emphasis is placed on penetration welds and out-of-position welds.
Prerequisite: WLD 126 or permission of the Instructor

WLD 130 Metal Fabrication 3(2-2)
Fundamentals of metal fabrication procedures and metal layout procedures are covered in this course. Pipe layout and procedures are also covered.
Prerequisites: WLD 127 and DRF 101

WLD 150 Non-Destructive Testing 3(3-0)
A course to familiarize the student with the theory, technique, and equipment used for magnetic particle and liquid penetrant test methods as they are applied to inspection and nondestructive testing in the metal fabrication industry for quality control.
WLD 225 Advanced Welding  8(4-8)
Multi-position welding will be emphasized. The use of arc, TIG, and MIG welding equipment and weld-testing devices are covered. Reading of welding prints and use of A.W.S. welding symbols are also included. This course prepares students to pass A.W.S. structural code welding tests on plate.
Prerequisite:  WLD 127

WLD 226 Industrial Welding  8(4-8)
This course builds further proficiency in manual welding processes along with the associated welding theories. The welding processes in this course include submerged arc welding, TIG, MIG, SMAW, and pattern layout; and operation of multi-oxyacetylene electric-eye cutting torches.
Prerequisite:  WLD 225

WLD 227 Advanced Industrial Welding  8(4-8)
A further study of destructive and nondestructive testing, study and operation of plasma-arc welding (PAW) and plasma-arc cutting (PAC) are included in the course. The students also become more proficient in their chosen areas of manual welding processes.
Prerequisite:  WLD 226

WLD 245 Pipe Welding  3(2-2)
This course is designed to prepare students to meet the requirements of the A.W.S. D1.1-79 (American Welding Society) and A.S.M.E. Section 9 code (American Society of Mechanical Engineers) for power piping. This course includes safety in welding and cutting; pipe beveling; preparation of beveled or branch pipe; electrode selection; butt weld-vertical fixed position 2G; butt weld-horizontal fixed position 5G; and pipe layout.
Prerequisite:  WLD 127

WLD 246 Advanced TIG Pipe Welding  3(2-2)
This course is designed for the individual who is interested in becoming proficient in the TIG process in all welding positions for pipe welding. Students weld ferrous and nonferrous piping in horizontal and vertical fixed positions as required of A.W.S. D1.1-79 (American Welding Society), A.S.M.E. Section 9 code (American Society of Mechanical Engineers), and A.P.I. Standard 1104, 15th Edition (American Petroleum Institute).
Prerequisite:  WLD 245

WLD 249 Beginning Robotics  3(0-3)
This course will enable students to set-up and teach the robot to weld parts or assemblies in an efficient manner. Students will learn the appropriate safety techniques required to operate and maintain the robot. Students will learn to write and copy various programs utilizing the World Coordinate System, and they will edit and test these programs.
Prerequisites:  WLD 126 and WLD 127 with a grade of “C” or better

WLD 281 Special Project - Welding I  2(2-0)
Students engage in intensive practice in a chosen welding technique or process such as MIG or TIG welding.
Prerequisite:  WLD 127 or equivalent experience as determined by the Instructor

WLD 282 Special Project - Welding II  2(2-0)
Continuation of WLD 281.
Prerequisite:  WLD 281

WLD 290 Special Project  3(0-3)
This course is designed to introduce students to the art of shaping and joining various types of metal to create works of art. They will learn how to gas weld, braze, solder, and arc weld many types of metals to create class projects. They will also learn how to fabricate, cut, bend and roll all types of metals. This course will also prepare students to continue in a specific area of concentration or interest in Advanced Metal Sculpture II.