

# COURSE DESCRIPTIONS

This portion of the 2009-2010 College Catalog lists all courses offered by Kirtland Community College. Courses are separated into their respective subject areas. The following example displays how to properly interpret a course description:

**EXAMPLE:**

**CHE-10003**      **Chemical Science**      **(F,W)**      **4(3-2)**  
Course description would be inserted here.  
**Prerequisite:** DEV-07300 **or**  
**Corequisite:** DEV-07300  
*(Credit Type)*

Chemical Science presents the elementary principles of inorganic, physical, and organic chemistry. It is intended to introduce college chemistry, or to satisfy course requirements in technical fields such as nursing. **Prerequisite or corequisite:** DEV-07300.

1. **Course Number:** Composed of three letters and a number. The letters identify a course by subject area. In this case, CHE is for Chemistry.
2. **Course Title:** Identifies a course by name.
3. **Course Availability:** The letter code designates the semester in which the course is usually offered: **S** = Summer; **W** = Winter; **F** = Fall; and **V** = Variable (occasionally or on demand if sufficient enrollment develops).
4. **Credit Hours:** The number of credits a course is assigned toward graduation.
5. **Lecture-Laboratory Hours:** During a 15-week semester, the first number refers to the hours the student will spend per week in a classroom lecture. The second number refers to the instructional hours that a student will spend in a laboratory per week. Some clinical nursing classes list a third number that specifies the number of hours spent in a clinical setting each week. The addition of these figures will produce the total number of contact hours the student will spend per week in the class over a 15-week semester.
6. **Course Description:** An explanation of the knowledge and skills gained by successful completion of the course.
7. **Prerequisite:** Requirement(s) that must be met or course(s) that must be taken before enrolling in a specific course.
8. **Corequisite:** Course that must be taken at the same time as the desired course.
9. **Distribution:** Some programs require courses of a specific distribution type. The category in which a course may be used is listed in italics.

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## ACCOUNTING (ACC)

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**ACC 10600 Fund of Accounting (F) 4 (4-0)**

This course is a study of the fundamental principles of accounting. Emphasis is placed on the accounting cycle from journal entries to the preparation of financial statements for both the service and merchandising firm, including payroll and accounting for cash.

**ACC 12100 Accounting Principles I (F) 4 (4-0)**

This course provides an introduction to fundamental accounting principles. The principles are applied to the recording of transactions as assets, liabilities, owner's equity, income and expenses. The recorded transactions are then used in the preparation of financial statements - balance sheet, income statement and statement of owner's equity for sole proprietorships and partnerships. Prerequisite: DEV-07300 or competency.

**ACC 12200 Accounting Principles II (W) 4 (4-0)**

This course builds on the fundamental accounting principles taught in Accounting 12100. The class covers the recording of corporate stock and dividend transactions and the proper presentation of the stockholder's equity section of the balance sheet. The course introduces management accounting concepts through analysis of financial statements, preparation of the statement of cash flows, the introduction to cost accounting concepts and an understanding of the need for and development of budgets. Prerequisite: ACC-12100.

**ACC 12500 Computer Accounting w/QuickBooks (W) 4 (4-0)**

This course is organized into three sections. The first section introduces students to the computer, Windows, and QuickBooks accounting for a service business. The second section focuses on merchandising businesses. The third section concentrates on payroll and creating a company using QuickBooks. Accounting concepts and their relationship to QuickBooks Pro 2000 are presented in each chapter. In addition to accounting concepts, students use a fictitious company and receive hands-on training in the use of QuickBooks Pro within each chapter.

**ACC 13100 Bookkeeping (V) 4 (4-0)**

This course provides an understanding of bookkeeping topics that include double-entry bookkeeping, business math, depreciation and inventory methods, payroll and payroll taxes, billing, and internal control. Prerequisite: Fundamentals of Accounting or Accounting 1 or permission of the instructor.

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## ALLIED HEALTH (ALH)

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<b>ALH 10101</b>	<b>Medical Terminology</b>	<b>(F,W,S)</b>	<b>2 (2-0)</b>
<p>This course is a survey study in the word-building system for medical terms. It covers word roots, combining forms, prefixes, suffixes, and medical word-building and decoding. Emphasis is placed on the correct spelling of terms, as well as definition and usage according to medical specialties. This course can be utilized by students who are planning a health career.</p>			
<b>ALH 10400</b>	<b>Nursing Assistant</b>	<b>(F,W,S)</b>	<b>6 (3-5)</b>
<p>This course will prepare students to provide competent, evidence-based assistive nursing care in a variety of healthcare settings, with primary focus on the elderly. Emphasis will be placed on effective communication and interpersonal skills; infection control measures; safety and emergency procedures; and the promotion of residents' independence and rights. Successful completion of this course will prepare students to be eligible for the state competency evaluation exam and placement on state Nurse Aide Registry. Prerequisite: DEV-08601 or competency, Physical Examination, TB Test, Uniform, and clean criminal background.</p>			
<b>ALH 10801</b>	<b>Pathology</b>	<b>(W)</b>	<b>3 (3-0)</b>
<p>This survey course focuses on basic diseases, components of diagnosis, etiology, common manifestations, and treatment. This course is utilized by students who are planning a health career. Prerequisite: ALH-10101 or permission of instructor, BIO-10701, and BIO- 10702.</p>			
<b>ALH 11201</b>	<b>Medical Ethics &amp; Law</b>	<b>(F,W)</b>	<b>1 (1-0)</b>
<p>This course provides an introduction to the health care professional's role, ethical dilemmas faced in the field, and legal responsibilities in individuals' roles and in society.</p>			
<b>ALH 20203</b>	<b>Standard First Aid</b>	<b>(F,W,S)</b>	<b>0.5 (0.25-0.25)</b>
<p>This course provides information &amp; practice for appropriate response in the event of an emergency. Students will gain knowledge and practice in professional CPR (one-man, two-man, infant, child, AED &amp; choking victim) and basic first aid.</p>			
<b>ALH 21500</b>	<b>Paramedic I</b>	<b>(V)</b>	<b>13 (11-2)</b>
<p>This course provides the foundation for the paramedic program and begins to prepare students to function in emergency medical care within the scope and responsibilities of the paramedic. Hands-on practical skills training is included. Prerequisite or corequisite: Licensed EMT or completion of EMT program and eligible for licensure.</p>			
<b>ALH 21701</b>	<b>Basic Emergency Medical Technician</b>	<b>(V)</b>	<b>10 (7-7)</b>
<p>This course prepares students to function in emergency medical services within the scope and responsibilities of a Basic EMT. Hands-on skills lab practice and structured clinical experiences at hospital emergency rooms and on ambulances is provided. Prerequisites: Valid driver's license, no felony convictions, completed health form, and immunizations prior to clinical.</p>			
<b>ALH 22500</b>	<b>Paramedic II</b>	<b>(V)</b>	<b>13 (9-8)</b>
<p>This course is the second part of the paramedic program. Hands-on practical skills training is included. Prerequisite: ALH-21500.</p>			
<b>ALH 23500</b>	<b>Paramedic III</b>	<b>(V)</b>	<b>16 (11-11)</b>
<p>This course is the third part of the paramedic program. It provides structured clinical experience in pre-hospital and hospital settings. Prerequisite: ALH-22500.</p>			
<b>ALH 24500</b>	<b>Paramedic IV</b>	<b>(V)</b>	<b>7 (0-7)</b>
<p>This course is the fourth part of the paramedic program. Further theory, hands-on training, and structured clinical experiences are included. Prerequisite: ALH-23500.</p>			

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## ART (ART)

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- ART 10000 Art History I (F) 3 (3-0)**  
This course surveys the major developments, movements, and philosophies of the visual arts from the Prehistoric to the Renaissance period by means of lecture, slides, and videos. (Humanities Credit)
- ART 10103 Art History II (W) 3 (3-0)**  
This course provides a survey of the major developments, movements, and philosophies of the visual arts from the Renaissance period to the present, by means of lecture, slides, and videos. (Humanities Credit)
- ART 10500 Intro to Design (F,W) 3 (0-4)**  
In this course, students will gain an understanding of the relationships between shape, form, pattern, texture, and color. By using computers, the student will create compositions dealing with biomorphic and rectilinear shapes. This course is intended to give the student a basic knowledge of the principles of composition and the elements of design and the role they play in the creative process. (Humanities Credit)
- ART 10600 Fund of Drawing I (F,W) 3 (0-4)**  
This course will stress the process of drawing as an imitation of nature through eye-hand coordination. Drawings are generated exclusively from still lifes as subject matter. Emphasis is on linear construction with a concern for accurate proportion and simple positive-negative/figure-ground relationships. Value structure is introduced after an initial but solid understanding of sighting and measuring, composition, and spatial relationships has been developed. Media is limited to achromatic/monochromatic dry drawing materials. (Humanities Credit)
- ART 10700 Painting I (F,W) 3 (0-4)**  
This course will stress the process of painting as an imitation of nature through eye-hand coordination. Paintings are generated from photographs and still lifes (observed objects) as subject matter. Emphasis is on the exploration of techniques with a concern for accurate proportion, simple positive-negative/figure-ground relationships, and color dynamics. Technical realism is introduced after an initial but solid understanding of color theory, compositions, and spatial relations has been developed. Media is limited to full-spectral wet oil materials. (Humanities Credit)
- ART 10800 Ceramics I (F,W,S) 3 (0-4)**  
This course provides an introduction to clay and its characteristics as a creative medium in utilitarian and non-utilitarian forms through hand-built and wheel-thrown objects. (Humanities Credit)
- ART 11000 Watercolors (S) 3 (0-4)**  
This course will stress the process of painting as an imitation of nature through eye-hand coordination. Paintings are generated from photographs and still lifes (observed objects) as subject matter. Emphasis is on the exploration of techniques with a concern for accurate proportion, simple positive-negative/figure-ground relationships, and color dynamics. Technical realism is introduced after an initial but solid understanding of color theory, compositions, and spatial relations has been developed. Media is limited to full-spectral wet watercolor materials. (Humanities Credit)
- ART 11400 Sculpture I (F,W) 3 (0-4)**  
Students will explore the processes and materials of sculpture (clay, stone, wood, plaster, metals, and other media) with an emphasis on the concepts of three-dimensional form and space. (Humanities Credit)
- ART 11500 Photography I (F,W) 3 (2-2)**  
This course offers an introduction to the basic technical skills of photography as a creative medium for personal expression. Students must provide a 35mm camera. (Humanities Credit)
- ART 19000 Digital Communications I (F,W) 3 (1-3)**  
The study of fundamental design concepts and elements as they are applied to digital media. Students will create digitally manipulated images using various imaging techniques for print media as it relates to their major area of study. (Humanities Credit)

- ART 20600 Drawing II (F,W) 3 (0-4)**  
 This course stresses the process of drawing as an imitation of nature through eye-hand coordination. Drawings are generated from still life and photographs as subject matter. In Drawing I, emphasis is on linear construction with a concern for accurate proportion and simple positive-negative/figure-ground relationships. Emphasis in Drawing II is on value structure and the development of the realistic rendering techniques. Students should show a concentration in experimental media, techniques, spatial relationships, and conceptual processes of drawing. Prerequisite: ART-10600. (Humanities Credit)
- ART 20700 Painting II (F,W) 3 (0-4)**  
 Painting II will continue to stress the process of painting as an imitation of nature through eye-hand coordination. Paintings are generated from photographs and still lifes as subject matter. Students embark on a wider exploration of techniques with a concern for accurate proportion, simple positive-negative/figure-ground relationships, and color dynamics. Technical realism is one approach used to develop a continuing understanding of color theory, composition, and spatial relationships. Emphasis is on the student's personal development and refinement of personal expression. Media is limited to full-spectral wet oil materials. Prerequisite: ART-10700. (Humanities Credit)
- ART 20800 Ceramics II (F,W,S) 3 (0-4)**  
 This course offers advanced study of forms in clay with emphasis on wheel-thrown objects, glaze calculations, and kiln procedures. Prerequisite: ART-10800. (Humanities Credit)
- ART 21400 Sculpture II (F,W) 3 (0-4)**  
 Students will be exposed to a broad variety of materials and techniques. Greater emphasis will be placed on scale and style. Prerequisite: ART-11400. (Humanities Credit)
- ART 21500 Photography II (F,W) 3 (2-2)**  
 This course provides creative work for the advanced student in developing a photography portfolio. This course will expand upon the techniques and skills learned in Photography I. Students will explore a variety of films and specialized processing techniques, as well as creative darkroom printing procedures. Students must provide a 35mm camera. Prerequisite: ART-11500. (Humanities Credit)
- ART 21800 Ceramics (Studio Problems) (F,W,S) 3 (0-4)**  
 Students will be expected to begin developing a style, concentrating their studies on specific forming techniques. A greater emphasis will be put on formulation of glazes and operating of kilns. Prerequisite: ART-20800. (Humanities Credit)
- ART 22400 Advanced Sculpture I (F,W) 3 (0-4)**  
 This course will allow students to intensify their studies of techniques briefly touched on in Sculpture I and II. Each student will be encouraged to explore how personal issues influence the development of his/her own style. Prerequisite: ART-21400. (Humanities Credit)
- ART 22500 Intro to Color Photography (F,W) 3 (0-4)**  
 By using color transparency film, computers, and/or color negative film, students will explore the use of color as a compositional element in photography. Prerequisite: ART-11500. (Humanities Credit)
- ART 22800 Ceramics (Studio Operations) (F,W,S) 3 (0-4)**  
 This course will be devoted to polishing the students' skills in all areas. Great attention will be given to kiln operation, glazing techniques, mould making, and kiln and studio equipment fabrication. Prerequisite: ART-21800. (Humanities Credit)
- ART 23400 Advanced Sculpture II (F,W) 3 (0-4)**  
 During this course, students will pursue their own particular interests. Students will be encouraged to experiment with different media and ideas. Prerequisite: ART-22400. (Humanities Credit)
- ART 23500 Digital Communications II (F,W) 3 (1-3)**  
 A continuation of the concepts and elements with an emphasis in the creative processes applied to digital media. Students will utilize various digital media to create art related to their major area of study. Prerequisite: ART-19000. (Humanities Credit)

<b>ART 25000</b>	<b>Illustration I</b>	<b>(F,W)</b>	<b>3 (1-3)</b>
This is an introductory course in the basic black, white, and color media illustration techniques with exploration in figurative drawing, media techniques, color and composition, spatial relationships, and conceptual progress of page layout. Illustration I will utilize the knowledge gained in Fundamentals of Drawing I to produce artwork that tells a story or expresses an idea. Artwork is generated by the media available to the student that best fits the idea, such as graphite, charcoal, ink, digital, photography, paint, colored pencil, etc. The ultimate goal in illustration is to create work that can be used for publication, whether magazine, book, brochure, etc. Prerequisite: ART-10600. (Humanities Credit)			
<b>ART 26000</b>	<b>Illustration II</b>	<b>(F,W)</b>	<b>3 (1-3)</b>
Emphasis will be placed on the exploration of color media and processes within specific illustration assignments. Problem-solving is encouraged through creative investigation. Prerequisite: ART-25000. (Humanities Credit)			
<b>ART 27504</b>	<b>Advanced Drawing</b>	<b>(F,W)</b>	<b>3 (1-3)</b>
This course continues the elements of Drawing II and emphasizes independent problem-solving, refinement of technical skills and the development of conceptualization processes. (Humanities Credit)			
<b>ART 27514</b>	<b>Welded Sculpture I</b>	<b>(F,W)</b>	<b>3 (1-3)</b>
Welded Sculpture will deal with metal as a sculptural medium. Students will use various joining techniques such as gas welding, brazing, wire welding and stick welding. In addition to the different welding processes, each student will need to learn how to use other machines that form the metal that you will be working with.			
<b>ART 27531</b>	<b>Rendering</b>	<b>(F,W)</b>	<b>3 (1-3)</b>
Course description not currently available. Please contact instructor for more information.			
<b>ART 27532</b>	<b>Photo Studio Problems</b>	<b>(F,W)</b>	<b>3 (1-3)</b>
Course description not currently available. Please contact instructor for more information.			
<b>ART 27533</b>	<b>Watercolors II</b>	<b>(S)</b>	<b>3 (1-3)</b>
An advanced course in the basic painting sequence, Watercolors II will continue to stress the process of painting as an imitation of nature through eye-hand coordination. Students embark on a wider exploration of techniques with a concern for accurate proportions, simple positive-negative/figure-ground relationships, and color dynamics. Technical realism is one approach to create with a continuing understanding of color theory, composition, and spatial relationships. Emphasis is on the student's personal development and refinement of personal expression. Media is limited to full-spectral watercolor materials. Prerequisite: ART-11000 (Humanities Credit)			
<b>ART 27545</b>	<b>Computer Generated Images I</b>	<b>(F,W)</b>	<b>3 (1-3)</b>
In this course, students will learn the fundamental concepts and features of Adobe Photoshop. These concepts include photo editing and retouching, color correction, layer basics, and special effects. (Humanities Credit)			
<b>ART 27546</b>	<b>Computer Generated Images II</b>	<b>(F,W)</b>	<b>3 (1-3)</b>
Building on the techniques learned in ART-27545, this course teaches advanced techniques used by professional graphic artists and photographers. Prerequisite: ART-27545. (Humanities Credit)			
<b>ART 27550</b>	<b>Digital Darkroom</b>	<b>(F,W)</b>	<b>3 (1-3)</b>
Through the use of conventional cameras/processes and their digital counterparts, students will learn to scan, edit, manipulate, and print photographic images. (Humanities Credit)			
<b>ART 27553</b>	<b>Adv Black &amp; White Photography</b>	<b>(F,W)</b>	<b>3 (1-3)</b>
Students will draw on skills acquired in Photography I and II to develop and polish a personal style. Assignments will be developed to aid the student in pursuing their own unique goals. Prerequisite: ART-21500. (Humanities Credit)			
<b>ART 27565</b>	<b>Comic Book Illustration</b>	<b>(F,W)</b>	<b>3 (1-3)</b>
This course provides a basic introduction to comic book illustration, with exploration in figure drawing, media, techniques, spatial relationships, and the conceptual progress of page layout. (Humanities Credit)			
<b>ART 27566</b>	<b>Computer Generated Images III</b>	<b>(F,W)</b>	<b>3 (1-3)</b>
Building on the fundamentals learned in ART-27545 and ART-27546, this course explores the advanced type techniques and effects, layout, and design. Prerequisite: ART-27546. (Humanities Credit)			

**ART 27571 Computer Animation I (F,W) 3 (1-3)**

Computer Animation I is an introductory study of the three-dimensional computer images and animation. The class will use 3D Studio to create three-dimensional imagery, apply texture maps, and lighting effects. Several animation techniques will also be studied. Students will meet in small groups to discuss lessons and activities. (Humanities Credit)

**ART 27573 Computer Animation II (F,W) 3 (1-3)**

This course further develops the student's skill in 3D Studio Max. It will emphasize 'realistic' rendering by means of developing the student's conceptual and technical understanding of effective texture and lighting.

**ART 27575 DS-Computer Animation III (F,W) 3 (1-3)**

This course focuses on advanced techniques for animators. Both classical animation and new digital skills and techniques will be covered with an emphasis on the situations that are best suited for the student's ultimate goal in their work.

**ART 27578 Computer Generated Images IV (F,W) 3 (1-3)**

This course continues the exploration of advanced type techniques and effects, layout, & design. Prerequisite: ART-27566 (Humanities Credit)

**ART 27581 Children's Book Illustration (F,W) 3 (1-3)**

This course provides a basic introduction to aesthetic principles, including color and composition, through a variety of materials, with emphasis on media and techniques for children's storybooks. (Humanities Credit)

**ART 27587 Painting IV (F,W) 3 (1-3)**

Emphasis will be placed on the student's ability to develop ideas, themes, and motifs of personal significance and the formal, technical skills to successfully execute his/her work. The course will also examine important theoretical and aesthetic issues related to art and will review major figures in contemporary painting. Prerequisite: ART-21600. (Humanities Credit)

**ART 27590 Watercolors III (S) 3 (1-3)**

An advanced course in the painting sequence, Watercolors III will emphasize individual development and refinement of personal expression in various approaches to painting. Students embark on a wider exploration of techniques with concern for accurate proportions, positive-negative/figure-ground relationships, and color dynamics while finding the artist within. Realism is only one approach to creating with a continuing understanding of color theory, composition, and spatial relationships. Prerequisite: ART-27533. (Humanities Credit)

**ART 27598 Portfolio II (F,W) 3 (1-3)**

This course continues the elements of Portfolio to develop a unified body of work.

**ART 27611 Rendering II (F,W) 3 (1-3)**

This course continues the elements of Rendering in superrealism. (Humanities Credit)

**ART 28000 Portfolio (F,W) 3 (3-1)**

This is an advanced course in portfolio preparation. It will stress the process of preparing an intensive portfolio for the artist's market. Résumés and artist's statements are written to develop an initial but solid understanding of the artist's work.



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## AUTOMOTIVE (AUT)

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**AUT 16100 Engine Fundamentals & Overhaul (W) 4 (3-3)**

This course provides an introduction to design, operation, troubleshooting, and service procedures of modern gasoline engines. The student will participate in disassembly, measurement, inspection, and reassembly of engine components. Use of technical data and service procedures will be stressed. Prerequisite: AUT-16302 or instructor's permission.

**AUT 16201 Fuel Systems & Emission Control (W) 4 (3-3)**

This lecture/lab course is designed to provide instruction in fundamentals, construction, operation, troubleshooting, and servicing of the components of the fuel and emission control systems. Students will participate in disassembly and reassembly of components and fuel systems and in emission control testing. Prerequisite: AUT-16401 or instructor's permission.

**AUT 16302 Automotive Fundamentals (F) 4 (2-3)**

This is a lecture/lab course designed to familiarize the student with the automotive unit, design, production, operating, testing, servicing, and job opportunities. Technician certification will be covered on the state and national levels. General ethics at school, on and off the job, along with sexual harassment education, will also be addressed.

**AUT 16401 Basic Electricity (F) 3 (2-2)**

This electrical course is designed as a prerequisite for automotive electrical classes. Areas of instruction will cover basic electricity, magnetism, fundamentals of batteries, starting motors, charging systems, ignition systems, electrical accessories, and basic wiring. Prerequisite: DEV-06300.

**AUT 16801 Automotive Electrical Systems (W) 4 (3-3)**

In this course, students will develop technical knowledge and skills necessary to service and diagnose modern electrical systems. Emphasis will be placed on electrical testing techniques and use of electrical testing equipment. Instruction and lab work will cover chassis wiring, electrical accessories, batteries, starters, charging systems, and ignition system service. Prerequisite: AUT-16401 or instructor's permission.

**AUT 17200 Intro to Diesel Service (F) 4 (3-3)**

This lecture/lab course is designed to teach students the fundamentals of Diesel Technology. The curriculum is currently geared toward instructing in the repair and maintenance of diesel engine powered vehicles (cars and light duty trucks) including preventative maintenance techniques; diagnosing/troubleshooting; assembly/disassembly of engines, electronic fuel systems, power trains; diagnostic and other essential skills to perform required tasks. Crossover opportunities exist in the automotive, passenger car and truck technician field for those who complete diesel technician training. Prerequisite: AUT 16302 or instructor's permission.

**AUT 17703 Automotive Braking Systems (F) 4 (3-3)**

This course is designed to provide instruction and skill development in automotive brake system theory and service. Students will develop skills and technical knowledge in the evolution of operation, theory, diagnosis, and repair of conventional and modern computer-controlled anti-lock braking systems. Corequisite: AUT-16302 or instructor's permission.

**AUT 19100 Auto Body Internship I (F) 5 (0-5)**

This is the first in a sequence of two courses required for completion of the Auto Body Specialist certificate program. The student is trained at an appropriate work site in the community. A tailored training plan for the student is designed by the program coordinator and is administered at the work site. Monitoring and evaluation of the student's progress is performed on a regular basis by the supervisor at the work site and the program coordinator. Prerequisite: Admission to Auto Body internship program. Corequisite: 8-9 credits of appropriate electives and instructor permission.

**AUT 19200 Auto Body Intership II (W) 5 (0-5)**

This is the second in a sequence of two courses required for completion for the Auto Body Specialist program. The students receives advanced training at an appropriate work site in the community in accordance with the same requirements as AUT19100. Prerequisite: Successful completion of AUT19100 and instructor permission.

- AUT 20402 Intro to Auto Service Management (W) 2 (2-0)**  
 This course is a study of facility licensing and management, with coverage of customer relations, promotional techniques, ethics, sexual harassment issues, job-seeking skills, and the laws of the State of Michigan as they apply to the automotive repair industry. The subjects of warranty processing, expense control, productivity, and time labor standards are defined and studied. Employee compensation and incentives, along with job opportunities and classifications, are also discussed and identified. Prerequisite: AUT-16302 or instructor permission.
- AUT 20403 Advanced Auto Service Management (W) 1**  
 This course is a study of management techniques which are less tangible than previously covered in AUT-20402. It includes administrative leadership functions, stress management, the employee acquisition and dismissal process, and motivational techniques. Prerequisite: ENG10303. Prerequisite or corequisite: AUT20402.
- AUT 20404 Auto Service Management (W) 3 (3-0)**  
 This course includes AUT-20402, Introduction to Automotive Service Management, and additionally studies management techniques, which are less tangible. It includes administrative leadership functions, stress management, the employee acquisition and dismissal process, and motivational techniques. Prerequisites: AUT-16302, and ENG-10303.
- AUT 21800 Automatic Transmissions (F) 4 (2-4)**  
 In this lecture/lab course, students are prepared to service, diagnose, and overhaul commonly used automatic transmissions and transaxles. Emphasis will be placed on principles of operation, model variations, servicing techniques, and troubleshooting procedures. Prerequisite: AUT-16302 or instructor's permission.
- AUT 23101 Auto Service Area-Chassis (W) 4 (0-6)**  
 This is a specialty service lab for students pursuing the Chassis Specialist certificate. Prerequisites: AUT-16201, AUT-16302, and AUT-17702 (or AUT-17703). Corequisite: AUT-16500 (or AUT-26500).
- AUT 23102 Auto Service Area-Powertrain (W) 4 (0-6)**  
 This is a specialty service lab for students pursuing the Powertrain Specialist certificate. Prerequisites: AUT-17702 or AUT-17703 and AUT-17901 or AUT27900. Corequisite: AUT-16100.
- AUT 23103 Auto Service Area-Electrical (W) 4 (0-6)**  
 This is a specialty service lab for students pursuing the Electrical Specialist certificate. Prerequisites: AUT-16201, AUT-16302, AUT-16401, AUT-16801, and AUT-26601.
- AUT 23104 Automotive Internship (W) 5 (0-5)**  
 This internship offers supervised automotive repair experience at a selected automotive repair facility. Students accomplish the course objectives while employed in the automotive industry. This course is required for completion of the associate in applied science, and the master certificate program. Prerequisites: successful completion of automotive program curriculum. The student will complete a minimum 180 hours in this course. Corequisite: AUT-17901 or AUT-27901 or instructor permission.
- AUT 26500 Steering Suspension & Alignment (F) 4 (3-3)**  
 This is a lecture/lab course covering nomenclature and operating principles of steering and suspension systems. Emphasis is on skill development in servicing power steering systems, replacement of suspension components, and four-wheel alignment. Prerequisite: AUT-16302 and AUT-17702 or AUT-17703 or instructor's permission.
- AUT 26601 Engine Performance & Diagnostics (F) 4 (3-3)**  
 Through the study of theory and use of testing and diagnosis procedures for computerized engine controls, the student will develop the skills required of a diagnostic tune-up technician. Prerequisites: successful completion of first and second semester of automotive curriculum or instructor's permission and AUT-16201, AUT-16302, AUT-16401, and AUT-16801.
- AUT 26700 Diesel Eng Performance & Diagnostic (W) 4 (3-3)**  
 This is a lecture/lab course designed to teach students performance and diagnostic procedures on modern passenger car and light duty truck diesel engines. Differences between diesel engine diagnostics and gasoline engines will be covered in great detail. Combustion chamber, fuel, cooling, and lubrication system designs are discussed. Maintenance requirements due to low sulfur fuel, particulate traps, air filter service and new engine oil configurations are all covered. Prerequisite: AUT17200 or instructor's permission.

**AUT 27000 Heating & Air Conditioning**

**(F)**

**3**

In this basic refrigeration and air conditioning course, students will gain skills in refrigeration tools and materials, basic refrigeration systems, compressors, refrigerant controls, electric circuit controls, refrigerants testing, and repair of air conditioning units. Prerequisite: AUT-16302 or instructor's permission.

**AUT 27900 Manual Trans Drivelines/Rear Axles**

**(W)**

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This is a lecture/lab course in the function, construction, operation, servicing, and troubleshooting of conventional power transmission components used in passenger cars and light trucks; clutch, manual transmission/transaxel, propeller shafts, universal joints, and rear axles. The student is given experience in disassembly and reassembly of component parts. Prerequisite: AUT-16302 or instructor permission.

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## **AVIATION (AIR)**

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**AIR 25000 Private Pilot Ground School**

**(W)**

**3 (3-0)**

This is a beginning course for students engaged in primary flight instruction or interested in such instruction. Topics include introduction to airplanes, airplane systems, theory of flight, airports, communications, air traffic control, weight and balance, meteorology, Federal Aviation Regulations, Airmen's Information Manual, flight computer, basic navigation, performance factor, radio navigation, and medical factors of flight. Upon successful completion, the student will be qualified to take the Federal Aviation Administration written examination for private pilots.

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## BIOLOGY (BIO)

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- BIO 10100    General Biology** **(F,W)** **4 (3-2)**  
This is a lecture and laboratory course in the basic principles of life science; genetics, origin, and evolution of life, structure, function, and classification of organisms and interactions in the ecosystem are stressed. (Science Credit)
- BIO 10700    Essentials of Anatomy & Physiology** **(F,W,S)** **4 (3-2)**  
This course provides an abbreviated study of the gross and microscopic structures and functions of the systems, organs, and tissues of the human body. Terminology and common pathologies of each system will be introduced. This course includes two hours of laboratory.
- BIO 11500    Anatomy & Physiology I** **(F,W)** **4 (3-2)**  
The first of a two-semester sequence, the first semester covers the nature of life science, organization of the human body, cell chemistry and metabolism, the integumentary system, histology, the skeletal and muscular systems, and the nervous system. Prerequisite: high school chemistry with a minimum grade of "B" or CHE-10003 & CHE-10004 with a minimum grade of "C" or better in each. Students must have taken chemistry course within the past 10 years. (Science Credit, except for Associate in Science)
- BIO 11600    Anatomy & Physiology II** **(F,W,S)** **4 (3-2)**  
This is a continuation of BIO-11500 with emphasis on the sensory system, endocrine system, cardiovascular system, respiratory system, digestive system, urinary system, and reproductive system with an introduction to genetics. The course will conclude with a study of pregnancy and human growth and development. Prerequisite: BIO-11500 and High School Chemistry with a minimum grade of "B"; or permission of instructor. (Science Credit, except Associate in Science)
- BIO 20100    General Zoology** **(F)** **4 (3-2)**  
This course provides a lecture/laboratory survey of the major animal groups including internal and external structure; reproductive processes; behavior patterns; life history; and special features peculiar to each group. Some field work in identification of local animals is included. Prerequisite: BIO-10100 or permission of instructor. (Science Credit)
- BIO 20200    General Botany** **(V)** **4 (3-2)**  
This is a survey course in plant morphology. The structure, classification, and natural history of major plant groups is stressed, as well as extensive field work in the collection and identification of local plant species. (Science Credit)
- BIO 21000    Microbiology** **(F)** **4 (3-2)**  
This course provides a lecture/laboratory study of the major groups of microbes. The structure of the unicellular organism will be compared to the structure of multicellular organisms. Applications to medicine and ecology will be discussed. The course is designed for the liberal arts student as well as the health sciences student. Prerequisites: CHE-10003, CHE-10004, and BIO-10100, or BIO-11500 and BIO-11600, or permission of instructor. (Science Credit)
- BIO 21300    Nature Study** **(F,W,S)** **4 (3-2)**  
A lecture/laboratory and field course in the behavior, ecology, and classification of plants and animals, including recognition of local flora and fauna, the course is designed to give natural history background material to the liberal arts non-science major, to the non-specialists interested in outdoor life, to those interested in nature interpretation, and to elementary school teachers. (Science Credit)
- BIO 21500    Pathophysiology** **(F,S)** **4 (4-0)**  
Content of this course will examine the mechanism underlying disease processes and the subsequent adaptation and alterations in body function. Selective health problems will be emphasized throughout the course. Clinical application will be made in concurrent and subsequent nursing courses. Prerequisites: ALH-10101 and BIO-11600. (Science Credit, except for Associate in Science)

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## **BUSINESS & MARKETING (BUS)**

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**BUS 10100 Intro to Business (F,W,S) 3 (3-0)**

This course provides an orientation to characteristics and functions of business, business environment, opportunities, ownership, management, organization, marketing, physical plant, personnel, finance, ethics, law, and controls for decision making.

**BUS 201-- Internship in Business & Marketing (F,W,S) 3-9**

This course is designed to provide students with an opportunity to earn credit while obtaining meaningful discipline-related work experience outside the classroom setting. Students are expected to spend a minimum of 128 hours (3 credits) in an appropriate work setting. The course may be repeated for a maximum of nine credits. Prerequisite: 2.5 GPA, sophomore standing, employer and instructor approval, and submission to, and approval by, business department.

**BUS 20200 Grant Writing (V) 3 (3-0)**

This course is designed to give students experience in the research, writing, and planning skills involved in preparing grants. Emphasis is placed on writing grants for nonprofits.

**BUS 21000 Prin of Management (W) 3 (3-0)**

This course examines management as a basic process of organizing, directing, actualizing, and controlling the operation of a business enterprise. .

**BUS 21100 E-Commerce Management (W) 3 (3-0)**

This course examines and integrates the three elements that are crucial to the success of any e-commerce operation, those being, internet technology, business models and marketing. It addresses how companies are using the Internet to add value using the six-C framework of commerce, content, communication, connectivity, community, and computing. E-commerce management rests on three pillars - Internet and related technologies, business models, and marketing. Future managers learn how the Internet and the Web are organized, how sites can be located and how sites relate to one another. Managers then learn how these technologies affect business variables such as sales, costs, revenues and marketing.

**BUS 21500 Legal Environment of Business (F,W) 3 (3-0)**

This course provides an introduction to the legal environment as it relates to business and society, to provide the student with a basic understanding of law as it pertains to business operations and their relationships with society.

**BUS 24000 Financial Management (W) 3 (3-0)**

This course is designed to provide a basic foundation in the major areas of finance, providing the necessary background for courses in business finance, financial management, monetary theory, banking problems, public finance, agricultural finance, security markets, and related courses. Prerequisite: ACC-12200 or permission of instructor.

**BUS 24500 Personnel Management (F) 3 (3-0)**

The object of this course is to acquaint students with the problems of personnel management. Personnel problems that deal directly with departmental organization, employment procedures, methods of testing, occupational descriptions, job evaluations, merit rating, wage plans, wage and salary control, aids to employees, safety, health and recreation, and employer-employee relations are covered.

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## **CAREER & PERSONAL DEVELOPMENT (CAR)**

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**CAR 10201 College Survival and Success I (F,W,S) 1 (1-0)**

This course introduces skills necessary for early survival and success in college. It focuses on personal development, learning style analysis, time management, goal setting, and a thorough overview and orientation of Kirtland Community College programs, services, and resources.

**CAR 10202 College Survival and Success II (F,W,S) 1 (1-0)**

This course is designed to provide students with the opportunity to cultivate the academic skills necessary to become confident and capable learners. Students complete the college student inventory and discuss strategies. Topics include effective listening and reading strategies, concentration and memory, note taking, and test taking strategies.

**CAR 10203 College Survival and Success III (F,W,S) 1 (1-0)**

This course focuses on higher order skills such as creative and critical thinking, decision making, and communication. It also examines wealth and stress management and assists students in identifying career goals.

**CAR 10204 College Success and Survival (F,W,S) 3 (3-0)**

This course is designed to provide students with the opportunity to cultivate the skills, values, and attitudes necessary to become capable and confident learners. It introduces students to college resources, programs, and services and assists students in identifying career goals.

**CAR 10300 Career Development Skills (F,W) 1 (1-0)**

Career development skills are those abilities that allow students to be successful in all aspects of their careers. This course teaches career exploration, job search, employment correspondence, and interview and employability skills. Life skills such as time management, communications, and working cooperatively are emphasized. Students will engage in written, oral, and interpersonal activities to learn and demonstrate workplace skills.

**CAR 12600 Service Learning Lab (V) 1 (99-99)**

A service-learning project designed by an instructor to supplement course learning, this may be offered either as a required or optional lab.

**CAR 200-- Service Learning Project (V) 1-5**

An individual service-learning project will be designed under the supervision of the coordinator of service learning and appropriate faculty members. The student will design a community placement as the basis for academic learning.

Prerequisite: permission of the service learning advisory committee.

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## CARPENTRY (CPT)

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<b>CPT 10007</b>	<b>Orientation to the Trade</b>	<b>(F,W,S)</b>	<b>0.1</b>
<p>This course reviews the history of the trade, describes the apprentice program, identifies career opportunities for carpentry &amp; construction workers, &amp; lists the responsibilities &amp; characteristics a member of the trade should possess.</p>			
<b>CPT 10008</b>	<b>Build Materials Fasteners/Adhesives</b>	<b>(F,W,S)</b>	<b>0.3</b>
<p>This course describes the sources and uses of various softwoods and hardwoods, explains the grading systems for lumber and plywood, and discusses the composition and uses of various engineered sheet materials and laminated lumber products. It also describes the many kinds of fasteners and adhesives used with wood and masonry.</p>			
<b>CPT 10009</b>	<b>Hand and Power Tools</b>	<b>(F,W,S)</b>	<b>0.4</b>
<p>Provides detailed descriptions of the hand tools and portable power tools used by carpenters. Emphasis is on safe and proper operation of tools as well as care and maintenance.</p>			
<b>CPT 10010</b>	<b>Floor Systems</b>	<b>(F,W,S)</b>	<b>1</b>
<p>This course covers framing basics as well as the procedures for laying out and constructing a wood floor using common lumber and engineered building materials.</p>			
<b>CPT 10011</b>	<b>Wall and Ceiling Framing</b>	<b>(F,W,S)</b>	<b>0.8</b>
<p>This course describes the procedures for laying out and framing walls and ceilings, including roughing-in door and window openings, constructing corners and partition T's, bracing walls and ceilings, and applying sheathing.</p>			
<b>CPT 10012</b>	<b>Roof Framing</b>	<b>(F,W,S)</b>	<b>1.5</b>
<p>This course describes the various kinds of roofs and contains instructions for laying out rafters for gable roofs, hip roofs, and valley intersections. Coverage includes both stick-built and truss-built roofs.</p>			
<b>CPT 10013</b>	<b>Windows and Exterior Doors</b>	<b>(F,W,S)</b>	<b>0.5</b>
<p>This course describes the various types of windows, skylights, and exterior doors, and provides instructions for installing them. It also includes instructions for installing weather-stripping and locksets.</p>			
<b>CPT 10014</b>	<b>Reading Plans and Elevations</b>	<b>(F,W,S)</b>	<b>0.8</b>
<p>This course builds upon the basic information presented in the Introduction to Blueprints module studied in the core curriculum. Trainees will learn the techniques for reading and using blueprints and specifications with an emphasis placed on those drawings and types of information that are relevant to the carpentry trade. It also introduces the subject of quantity takeoffs.</p>			
<b>CPT 10015</b>	<b>Site Layout I: Dist Meas/Leveling</b>	<b>(F,W,S)</b>	<b>0.9</b>
<p>This course covers the principles, equipment, and methods used to perform the site layout task of distance measurement and differential leveling. Also covered is information about the layout of surveyors, field engineers, and carpenters; understanding and using site/plot drawings; and methods used for on-site communication.</p>			
<b>CPT 10016</b>	<b>Intro to Concrete/Reinforce Mat</b>	<b>(F,W,S)</b>	<b>0.4</b>
<p>This course describes the properties, characteristics, and uses of various types of cement, aggregates, and other materials that, when mixed together, form different types of concrete. Procedures for concrete volume estimates and testing of freshly mixed concrete are covered, along with methods and materials for curing concrete. Reinforcement materials used in concrete, such as reinforcement bars, bar supports, and welded-wire fabric are described and defined.</p>			
<b>CPT 10017</b>	<b>Foundations and Flatwork</b>	<b>(F,W,S)</b>	<b>0.6</b>
<p>This course covers the construction of forms for continuous, stepped continuous, pier, and grade beam concrete footings. Also covered are edge forms used for on-grade concrete slabs and similar structures. Forming terms, parts of forms, and the procedures for constructing basic footing and edge forms are included.</p>			
<b>CPT 10018</b>	<b>Concrete Forms</b>	<b>(F,W,S)</b>	<b>1.3</b>
<p>This course covers the applications and construction methods for various types of job-built forms, including wall, column, slab-and-beam, and stair forms. Instructor's Guide includes instruction sheets for construction of various forms.</p>			

<b>CPT 10019</b>	<b>Reinforcing Concrete</b>	<b>(F,W,S)</b>	<b>0.6</b>
<p>This course explains the selection and uses of different types of reinforcing materials. It describes general requirements for cutting, bending, splicing, and tying reinforcing steel, as well as placement of the steel in various types of footings, columns, walls, and slabs.</p>			
<b>CPT 10020</b>	<b>Handling and Placing Concrete</b>	<b>(F,W,S)</b>	<b>0.9</b>
<p>This course covers the tools, equipment, and procedures required for handling, placement, and finishing of concrete at the job site. Also covered is general information about joints made in concrete structures, the use of joint sealants, and form removal procedures. Safety procedures for handling, placing, and finishing concrete are emphasized.</p>			
<b>CPT 10023</b>	<b>Manufactured Forms</b>	<b>(F,W,S)</b>	<b>0.9</b>
<p>This course covers the types of manufactured forms and form hardware systems used in the construction of walls, columns, deck and roof slabs, beams and girders, culverts, and highways. It includes coverage of flying forms, slipforms, shoring, and architectural finishes.</p>			
<b>CPT 20023</b>	<b>Exterior Finish</b>	<b>(F,W,S)</b>	<b>1.4</b>
<p>This course covers the various types of exterior siding used in residential construction and their installation procedures, including several types of wood siding, as well as metal and vinyl siding. It also covers the installation of metal and vinyl gutters and downspouts.</p>			
<b>CPT 20024</b>	<b>Roofing Applications</b>	<b>(F,W,S)</b>	<b>1</b>
<p>This course covers the common materials used in residential and light commercial roofing, along with the safety practices and application methods for these materials. This includes shingles, roll roofing, shakes, tiles, metal, and membrane roofs, as well as the selection and installation of roof vents.</p>			
<b>CPT 20025</b>	<b>Thermal and Moisture Protection</b>	<b>(F,W,S)</b>	<b>0.2</b>
<p>In this course, the trainee will learn how to select and install various types of insulating materials in walls, floors, and attics. The uses and installation practices for vapor barriers and waterproofing materials are also covered.</p>			
<b>CPT 20026</b>	<b>Stairs</b>	<b>(F,W,S)</b>	<b>0.6</b>
<p>This course covers the various types of wooden stairs used in residential and commercial construction, along with the procedures for laying out stairs, cutting out stringers, and installing and finishing stairs.</p>			
<b>CPT 20027</b>	<b>Framing with Metal Studs</b>	<b>(F,W,S)</b>	<b>0.6</b>
<p>This course includes instructions for selecting and installing metal framing for interior walls, exterior nonbearing walls, and partitions.</p>			
<b>CPT 20028</b>	<b>Drywall One: Installation</b>	<b>(F,W,S)</b>	<b>0.6</b>
<p>This course describes the various types of gypsum drywall, their uses, and the fastening devices and methods used to install them. It contains detailed instructions for installing drywall on walls and ceilings using nails, drywall screws, and adhesives. It also covers fire- and sound-rated walls.</p>			
<b>CPT 20029</b>	<b>Drywall Two: Finishing</b>	<b>(F,W,S)</b>	<b>0.5</b>
<p>This course covers the materials, tools, and methods used to finish and patch gypsum drywall. It includes coverage of both automatic and manual taping tools.</p>			
<b>CPT 20030</b>	<b>Interior Finish One: Doors</b>	<b>(F,W,S)</b>	<b>0.8</b>
<p>This course covers the installation of metal doors and related hardware in steel-framed, wood-framed, and masonry walls, along with their related hardware such as locksets and door closers. It also covers the installation of wood doors, folding doors, and pocket doors.</p>			
<b>CPT 20031</b>	<b>Interior Finish Two: Suspend Ceiling</b>	<b>(F,W,S)</b>	<b>1</b>
<p>This course covers the materials, layout, and installation procedures for many types of suspended ceilings used in commercial construction, as well as ceiling tiles, drywall suspension systems, and pan-type ceilings.</p>			
<b>CPT 20032</b>	<b>Interior Finish Three: Trim</b>	<b>(F,W,S)</b>	<b>1</b>
<p>This course covers the different types of trim used in finish work. It focuses on the proper methods for selecting, cutting, and fastening trim to provide a professional finished appearance.</p>			

<b>CPT 20033</b>	<b>Interior Finish Four: Cabinet Inst</b>	<b>(F,W,S)</b>	<b>0.4</b>
This course provides detailed instructions for the selection and installation of base and wall cabinets and countertops.			
<b>CPT 20034</b>	<b>Site Layout II: Angular Measurement</b>	<b>(F,W,S)</b>	<b>1</b>
This course covers the principles, equipment, and methods used to perform the site layout tasks that require making angular measurements. Tasks include laying out building foundation lines and determining elevations by trigonometric leveling. The use of laser instruments, transits, theodolites, electronic distance measurement, and total stations are covered. It also reviews trade mathematics, including geometry and right-angle trigonometry, needed to perform the calculations related to angular measurements.			
<b>CPT 20035</b>	<b>Advanced Roof Systems</b>	<b>(F,W,S)</b>	<b>0.6</b>
This course covers commercial roofing materials and structures and describes the procedures for installing commercial roofing such as standing seam, lap seam, and builtup roofs.			
<b>CPT 20036</b>	<b>Advanced Floor Systems</b>	<b>(F,W,S)</b>	<b>0.6</b>
This course covers structural and lightweight concrete floors, in-floor radiant heating, and a variety of finish flooring, including hardwood floors, vinyl tile, carpeting, and terra cotta tile.			
<b>CPT 20037</b>	<b>Advanced Wall Systems</b>	<b>(F,W,S)</b>	<b>0.8</b>
This course covers installation of a variety of finishing materials, including paneling, wainscoting, and movable partitions. It also covers installation of curtain walls and fire-rated commercial construction.			
<b>CPT 20038</b>	<b>Advanced Stair Systems</b>	<b>(F,W,S)</b>	<b>1</b>
This course provides extensive coverage of materials and techniques used in finishing wooden staircases. It also covers a variety of stair systems used in commercial construction.			
<b>CPT 20039</b>	<b>Intro to Light Equipment</b>	<b>(F,W,S)</b>	<b>0.4</b>
This course introduces the trainees to various pieces of light construction equipment commonly used at a construction site, including the aerial lift, skid steer loader, trencher, electric power generator, compressor, compactor, and forklift. An overview of general safety, operation, and maintenance procedures is given for each type of equipment covered.			
<b>CPT 20040</b>	<b>Welding</b>	<b>(F,W,S)</b>	<b>1</b>
In this course, the trainee is introduced to the equipment, procedures, and safety practices used in cutting steel with oxyfuel equipment and in shielded metal arc welding. Labs include practice in cutting and welding techniques.			
<b>CPT 20041</b>	<b>Metal Buildings</b>	<b>(F,W,S)</b>	<b>0.5</b>
In this course, the trainee is introduced to the basic structural components, fastening methods, and assembly techniques for metal buildings. An overview of the materials and practices used in the application of roofs, wall panels, windows, doors, trim, and flashing is also provided.			
<b>CPT 20042</b>	<b>Intro to Project Management/Super</b>	<b>(F,W,S)</b>	<b>0.6</b>
Along with the principles of project planning, scheduling, estimating, and management, the trainee learns the basic skills required to supervise personnel. Several case studies are included.			

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## CHEMISTRY (CHE)

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<b>CHE 1003</b>	<b>Chemical Science</b>	<b>(F,W)</b>	<b>3 (3-0)</b>
Chemical Science presents the elementary principles of inorganic, physical, and organic chemistry. It is intended to introduce college chemistry, or to satisfy course requirements in technical fields such as nursing. Prerequisite: DEV-07300 or high school algebra. Corequisite: CHE-10004. (Science Credit)			
<b>CHE 1004</b>	<b>Chemical Science Lab</b>	<b>(F,W)</b>	<b>1 (0-2)</b>
This is a laboratory course to accompany CHE-10003. Corequisite: CHE-10003. (Science Credit)			
<b>CHE 10101</b>	<b>Gen Chemistry I</b>	<b>(F)</b>	<b>4 (4-0)</b>
General Chemistry I provides a thorough discussion of the topics of atomic structure, stoichiometry, solutions and pH, gas laws, electronic configuration and bonding theories, the periodic tables, and liquids and solids. Prerequisites: high school chemistry or CHE-10003 and CHE-10004 and one year of high school algebra. Prerequisite or corequisite: ENG-10303 or permission of instructor. Corequisite: CHE- 10102. (Science Credit)			
<b>CHE 10102</b>	<b>Gen Chemistry Lab I</b>	<b>(F)</b>	<b>1 (0-3)</b>
This is a laboratory course to accompany CHE-10101. Corequisite: CHE-10101. (Science Credit)			
<b>CHE 10201</b>	<b>General Chemistry II</b>	<b>(W)</b>	<b>4 (4-0)</b>
This is a continuation of General Chemistry I, concerned broadly with thermodynamics and kinetics. Topics discussed include kinetics data analysis and reaction mechanisms, chemical equilibrium, electrochemistry, chemical thermodynamics, nuclear chemistry, and some descriptive chemistry of the elements. Prerequisite: CHE-10101. Corequisite: CHE-10202. (Science Credit)			
<b>CHE 10202</b>	<b>General Chemistry II Lab</b>	<b>(W)</b>	<b>1 (0-3)</b>
This is a laboratory course to accompany CHE-10201. Corequisite: CHE-10201. (Science Credit)			
<b>CHE 20101</b>	<b>Organic Chemistry I</b>	<b>(V)</b>	<b>4 (4-0)</b>
Modern bonding theory in organic molecules, theory of reactions, stereochemical principles, chemistry of alkanes, cycloalkanes, alkenes, dienes, alkynes, aromatics, and alcohols, with special emphasis on reaction mechanisms. Prerequisite: CHE10200 General Chemistry II.			
<b>CHE 20102</b>	<b>Organic Chemistry Lab I</b>	<b>(V)</b>	<b>1 (0-3)</b>
Fundamental laboratory techniques and preparations. Prerequisite: CHE 10200 General Chemistry II.			
<b>CHE 20201</b>	<b>Organic Chemistry II</b>	<b>(V)</b>	<b>4 (4-0)</b>
Study of ethers and epoxides, carbonyl-containing compounds, aldehydes, ketones, carboxylic acids and their derivatives, carbanion chemistry, aliphatic and aromatic nitrogen-containing compounds, with special emphasis on bioorganic compounds, amino acids and polypeptides, carbohydrates and lipids. Prerequisite: CHE20101 Organic Chemistry I.			
<b>CHE 20202</b>	<b>Organic Chemistry Lab II</b>	<b>(V)</b>	<b>1 (0-3)</b>
Fundamental laboratory techniques and preparations. Prerequisite: CHE20101 Organic Chemistry I.			

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## COMPUTER INFORMATION SYSTEMS (CIS)

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<b>CIS 01000</b>	<b>Basic Computing</b>	<b>(F,W)</b>	<b>2 (2-0)</b>
<p>This course is designed to help students learn about the fundamental aspects of using a computer. It is designed for beginners who have never used a computer or are afraid to use one. This course is slower paced and does not have the rigor of a transferable computer course. Students will learn about hardware components, Windows, word processing software, the Internet, and e-mail. This course does not transfer to other colleges or universities. No prerequisite.</p>			
<b>CIS 10500</b>	<b>Intro to Computers</b>	<b>(F,W,S)</b>	<b>3 (3-0)</b>
<p>Students will become familiar with hardware and software terminology/concepts, Windows operating system, word processing, spreadsheet, database management, presentation software, data communications, the Internet, and ethical/moral issues related to computing. Application software used is the current version of Microsoft Office Professional and the current version of the Internet Explorer. Keyboarding skills are required and necessary for successful completion of this course. Prerequisite: Keyboarding skills.</p>			
<b>CIS 11700</b>	<b>Visual Basic I</b>	<b>(W)</b>	<b>3 (1.5-1.5)</b>
<p>This course serves as an introduction to Visual Basic. The course introduces concepts concerning the design, creation, test, and execution of Visual Basic Applications. Prerequisite: CIS-10500 with a "B" or better, or demonstrated competency.</p>			
<b>CIS 11800</b>	<b>Visual Basic II</b>	<b>(V)</b>	<b>3 (1.5-1.5)</b>
<p>This Visual Basic Programming II course reviews algorithmic design concepts and implements them using the Visual Basic programming language. This course addresses Visual Basic programming constructs, arrays, files, and functions; then moves to advanced concepts, controls, and objects. Prerequisite: CIS-11700.</p>			
<b>CIS 17001</b>	<b>Microsoft Office</b>	<b>(F,W)</b>	<b>3 (3-0)</b>
<p>This course covers how to utilize and integrate all the applications contained within Microsoft Office. Exercises will involve business applications using the word processing, spreadsheet, database management, and presentation software components of Microsoft Office. Application software used Microsoft Office Professional which includes: Word, Excel, Access, and PowerPoint. Prerequisite: CIS-10500 or demonstrated competency.</p>			
<b>CIS 17102</b>	<b>PowerPoint</b>	<b>(V)</b>	<b>1 (1-0)</b>
<p>Students will create and modify slide show presentations using Microsoft PowerPoint. Emphasis will be placed on customizing slide shows by: a) changing colors, fonts, and styles; b) adding clip art or WordArt objects; c) embedding spreadsheets; and d) adding animation and transition effects. Students will learn how to present the show on a computer monitor and on the World Wide Web. Application software used is the current commercial version of Microsoft PowerPoint. Prerequisite: CIS-10500, or CIS-22302, or demonstrated competency.</p>			
<b>CIS 17200</b>	<b>Publisher</b>	<b>(V)</b>	<b>2 (2-0)</b>
<p>The student will learn desktop publishing concepts by working through hands-on projects that produce newsletters, brochures, web sites, business cards, letterheads, business forms, and specialty documents. Students will also learn how to customize publications and how to integrate other office objects (i.e., spreadsheets, charts, etc.) into a publication. Application software used is the current version of Microsoft Publisher. No prerequisite.</p>			
<b>CIS 17300</b>	<b>Microsoft Access</b>	<b>(V)</b>	<b>1 (1-0)</b>
<p>Students will learn how to create database tables, queries, reports and forms. Students will also learn how to develop relationships among the tables and how to publish database information to the internet. Application software used is Microsoft Access. Prerequisite: CIS-10500 or CIS-22302; or demonstrated competency.</p>			
<b>CIS 19600</b>	<b>Hardware Certification</b>	<b>(F)</b>	<b>3 (3-0)</b>
<p>This course will attempt to prepare students for the industry standard hardware certification exam. Topics will include major hardware components such as motherboards, processors, memory, storage, and peripheral devices. Operating System software from DOS up to the current Windows version will be covered. Techniques for troubleshooting problems and hands-on applications will be presented. Prerequisite: CIS-10500.</p>			

- CIS 19700 OS Certification (F) 3 (1-2)**  
 This course will help prepare students for the industry standard hardware certification exam with an emphasis on Operating System (OS) core components. Topics include Windows Operating System software and a review of major hardware components that address: motherboards, processors, memory, storage, and peripheral devices. Prerequisite: CIS-10500, or demonstrated competency.
- CIS 21000 Internet & Web Page Development (F) 3 (1-2)**  
 Students will be given an overview of the Internet, WWW and Windows file management techniques. Students will learn how to design and create W3C compliant web pages using HTML, XHTML, and cascading style sheets (CSS). Areas covered include: css formatting, hyperlinks, images, image maps, tables, newsletter formats, forms, framed pages, multimedia files, and java applets. Students will also learn how to create their own graphical images for their pages using web-based sites and Photoshop. Completed pages will be uploaded to the student's Internet web site and debugged. Prerequisite: CIS-10500.
- CIS 21500 Web Animation & Multimedia (W) 3 (3-0)**  
 Students will create animated graphic content for websites using the current commercial version of Macromedia Flash. Prerequisite: CIS-10500 or demonstrated competency.
- CIS 21900 MacIntosh OS X (F,W) 1 (1-0)**  
 The student will learn functions and commands in the MacIntosh operating system. Specific topics to be covered in this course include working with windows and menus, customizing the desktop, managing files and folders, and running application programs that come with the operating system. This course will offer a brief exposure to internet and multimedia applications, and how they operate in the Mac OS environment.
- CIS 22302 Windows (V) 1 (1-0)**  
 The student will learn functions and commands in the Windows operating system. Specific topics to be covered in this course include working with windows and menus, customizing the windows environment, managing files and folders, running application programs that come with Windows, multitasking, exploring multimedia features, and investigating data communication features.
- CIS 22400 UNIX (W) 2 (2-0)**  
 Students will learn about the UNIX operating system environment. They will learn about the different UNIX shells and how to issue basic system commands. Students will explore the UNIX file system (partitions, directories, navigation, etc.). Other topics covered include the following: 1) using common editors; 2) basic and advanced file management commands; 3) creating simple and complex shell scripts; 4) using pine for e-mail; 5) using UNIX utilities; and 6) programming in a UNIX environment. System administration will also be covered. Prerequisite: CIS-10500 or demonstrated competency.
- CIS 22500 Spreadsheets (W) 3 (3-0)**  
 Students will learn how to build, save, format, print, and modify spreadsheets. Students will also learn how to develop formulas/functions, charts, link worksheets, link workbooks, utilize auditing features, use database features, and develop macros. Application software is the current commercial version of Microsoft Excel. Prerequisite: CIS-10500 or demonstrated competency.
- CIS 22702 Microsoft Excel (V) 1 (1-0)**  
 This course explores the use of Microsoft Excel in business-related applications. Students will learn how to build, save, print and modify spreadsheets as well as how to create formulas/functions and charts. Application software used is the current commercial version of Microsoft Excel. Prerequisite: CIS-10500, or CIS-22302, or demonstrated competency.
- CIS 23501 Database Design (W) 3 (2-2)**  
 Students will learn the theoretical knowledge necessary to design and implement effective information databases. Areas such as file layout, data structures, implementation methods, security, and web interfacing will be addressed. Students will work with a currently popular commercially available database management system. Prerequisite: CIS-10500 or demonstrated competency.

<b>CIS 24000</b>	<b>Technology in Education</b>	<b>(F)</b>	<b>3 (3-0)</b>
Students will learn to operate a wide variety of technology-based equipment; select and assess instructional media materials, courseware, and software; and integrate technology and media into K-12 education. No Prerequisite.			
<b>CIS 26000</b>	<b>Intro to Computer Networking</b>	<b>(F)</b>	<b>3 (3-0)</b>
This course serves as an overview of digital data communications. The course addresses the following: data communications, digital and analog signals, communications media, multiplexers, data transmission, Protocols, Network concepts, WANs, MANs, LANs, communications services, the Internet, eBusiness, network security, and network management. Prerequisite: Keyboarding skills.			
<b>CIS 26100</b>	<b>Internet</b>	<b>(V)</b>	<b>1 (1-0)</b>
This course will investigate the resources of the Internet. Areas of exploration will be the World Wide Web, e-mail, Usenet newsgroups, FTP's and Telnet. This course will offer the students the ability to become comfortable finding and retrieving information from this network of networks. Prerequisite: CIS-10500 or demonstrated competency.			
<b>CIS 26200</b>	<b>Web Pages</b>	<b>(V)</b>	<b>1 (1-0)</b>
Students will design and create web pages using HTML. Once a page has been created, students will edit pages to include text formatting, hyperlinks, images, and tables. Pages will be uploaded to the Internet and debugged. Prerequisite: CIS-10500 or demonstrated competency.			
<b>CIS 26300</b>	<b>Advanced Web Pages</b>	<b>(V)</b>	<b>1 (1-0)</b>
Students will create a wide variety of web pages including forms, newsletters, and framed pages. They will also learn how to create and add multimedia files to web pages and how to add code for Java applets. Corequisite: CIS-26200 or demonstrated competency.			
<b>CIS 26400</b>	<b>JavaScript</b>	<b>(W)</b>	<b>3 (3-0)</b>
JavaScript is a programming language that resides inside HTML documents. It is used to create interactive web pages that incorporate banners, pop-up windows, calculations, interactive forms, dynamic images, etc., into web pages. JavaScript topics such as conditionals, functions, objects, properties, methods, event handlers, forms, and frames will be covered in this course. We will also cover ASP commands including database connectivity to give students exposure to serverside scripting. Prerequisite: CIS21000 or CIS26300 or demonstrated competency.			
<b>CIS 27001</b>	<b>Programming I</b>	<b>(F)</b>	<b>3 (3-0)</b>
This course investigates general methods of problem-solving, principles of structured programming, and algorithmic design. This includes data types and variable declarations, I/O (input and output), arithmetic operators, assignment and expressional operators, static and automatic variables, external declaration, functions and modular programming, array processing, pointers, record data structures, and file I/O. Programming language used is C. Corequisite: MTH-12000 or demonstrated competency AND CIS10500 or demonstrated competency.			
<b>CIS 27101</b>	<b>Programming II</b>	<b>(W)</b>	<b>4 (4-0)</b>
General methods of problem-solving, principles of algorithmic design, and object-oriented design are discussed. This includes data types, functions, arrays, pointers, objects, classes, class inheritance, polymorphism, exceptions, input, output, and file-handling techniques. Other topics introduced include linked lists, stacks, queues, recursion, and dynamic allocation. Programming language used is C++. Prerequisite: Grade of "C" or better in CIS-27001 or demonstrated competency.			
<b>CIS 27201</b>	<b>Web Programming</b>	<b>(S)</b>	<b>3 (3-0)</b>
Students will produce interactive, dynamic web-based applications using popular, marketable, web programming languages and tools. Server-side scripting and the .NETenvironment will be explored. Prerequisite: CIS-21000 (or CIS-26200 AND CIS-26300) or demonstrated competency.			
<b>CIS 275--</b>	<b>Directed Study-Computer Information System</b>	<b>(V)</b>	<b>1-6</b>
This is a course designed to meet special occupational needs for individual students. Prerequisite: advisor recommendation.			

**CIS 280-- Internship in Computer Information Systems (V)**

**3-9**

This course is designed to provide students with an opportunity to earn credit while obtaining meaningful discipline-related work experience outside the classroom setting. Students are expected to spend a minimum of 128 hours (3 credits) in an appropriate work setting. The course may be repeated for a maximum of nine credits. Prerequisite: 2.5 G.P.A., sophomore standing, employer and instructor approval, and submission to, and approval by, the CIS department.

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## CORE CONSTRUCTION (COR)

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<b>COR 10001</b>	<b>Basic Safety</b>	<b>(F,W,S)</b>	<b>0.6</b>
<p>This course covers need-to-know information for trainees to work safely. It includes what personal protective equipment to wear, how to perform basic construction tasks safely, and what to do if an accident occurs.</p>			
<b>COR 10002</b>	<b>Introduction to Construction Math</b>	<b>(F,W,S)</b>	<b>0.6</b>
<p>From basic addition to multiplying fractions and more, this course prepares trainees to do the calculations they'll be performing on the job site. This includes multiplication tables and unit conversion charts.</p>			
<b>COR 10003</b>	<b>Introduction to Hand Tools</b>	<b>(F,W,S)</b>	<b>0.4</b>
<p>This course covers a basic toolbox worth of equipment with color pictures of the tools and illustrations of how to use them. It also covers maintenance instructions and safety tips.</p>			
<b>COR 10004</b>	<b>Introduction to Power Tools</b>	<b>(F,W,S)</b>	<b>0.2</b>
<p>This course provides pictures and how-to-use instructions for tools powered by electricity, batteries, and pressurized air, such as drills, saws, grinders and sanders, and other common construction equipment. It also covers maintenance instructions and safety tips.</p>			
<b>COR 10005</b>	<b>Introduction to Blueprints</b>	<b>(F,W,S)</b>	<b>0.3</b>
<p>This course introduces trainees to the different types of plans and how they represent a finished building. It shows the parts of blueprints in detail, including symbols, the title block, and gridlines.</p>			
<b>COR 10006</b>	<b>Basic Rigging</b>	<b>(F,W,S)</b>	<b>0.8</b>
<p>This course covers the slings, hardware, hoists, and hitches used in rigging operations. It also highlights critical safety issues and accepted rigging techniques and practices.</p>			
<b>COR 10007</b>	<b>Basic Communication Skills</b>	<b>(F,W,S)</b>	<b>0.2</b>
<p>Provides trainees with techniques for communicating effectively with co-workers and supervisors. Includes practical examples that emphasize the importance of verbal and written information and instructions on the job. Also discusses effective telephone and e-mail communication skills.</p>			
<b>COR 10008</b>	<b>Basic Employability Skills</b>	<b>(F,W,S)</b>	<b>0.6</b>
<p>Identifies the roles of individuals and companies in the construction industry. Introduces trainees to critical thinking, problem solving skills, and computer systems and their industry applications. Also reviews effective relationship skills, effective self-presentation, and key workplace issues, such as sexual harassment, stress, and substance abuse.</p>			

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## COSMETOLOGY (COS)

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<b>COS 11200</b>	<b>Manicuring I</b>	<b>(F,W,S)</b>	<b>2.5 (0.51-4)</b>
<p>This course covers orientation and theory. Instruction and application include water manicure, hot oil manicure, and pedicure, along with sanitation of equipment and implements. Students must pass this course with a minimum grade of "C-" to advance to the next section.</p>			
<b>COS 11300</b>	<b>Manicuring II</b>	<b>(F,W,S)</b>	<b>2.5 (0.51-4)</b>
<p>This course covers theory and laboratory work on the public. Instruction and application include sculptured acrylic nails, overlays, and fill-ins. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-11200.</p>			
<b>COS 11400</b>	<b>Manicuring III</b>	<b>(F,W,S)</b>	<b>2.5 (0.51-4)</b>
<p>This course covers theory and laboratory work on the public. Instruction and application include nail tips (blended) and nail wraps. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-11300.</p>			
<b>COS 11500</b>	<b>Manicuring IV</b>	<b>(F,W,S)</b>	<b>2.5 (0.51-4)</b>
<p>This course covers theory and laboratory work on the public. Instruction and application include spa manicures, gel nails, and hand and feet paraffin. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-11400.</p>			
<b>COS 11600</b>	<b>Manicuring V</b>	<b>(F,W,S)</b>	<b>2.5 (0.51-4)</b>
<p>This course covers theory and laboratory work on the public. Instruction and application include nail art, air brushing, and Michigan state laws. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-11500.</p>			
<b>COS 11700</b>	<b>Manicuring VI</b>	<b>(F,W,S)</b>	<b>2.5 (0.51-4)</b>
<p>This course covers theory review, preparation for the final test, and practice of all curriculum in clinic or on a manikin hand. Students complete a final exam and a simulated state board exam. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-11600.</p>			
<b>COS 12100</b>	<b>Cosmetology I</b>	<b>(F,W,S)</b>	<b>2.5 (0.5-3.5)</b>
<p>This course covers orientation, career information, state laws and regulations, professional image, first aid, chemistry, electricity, job-seeking, and professional ethics. Students must pass this course with a minimum grade of "C-" to advance to the next section.</p>			
<b>COS 12200</b>	<b>Cosmetology II</b>	<b>(F,W,S)</b>	<b>2.5 (0.5-3.5)</b>
<p>This course covers health, public sanitation methods, chemical agents, types, classifications of bacterial growth, biology, infections, infection control, products, tools, equipment use and safety, bacteriology, and decontamination. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-12100.</p>			
<b>COS 12300</b>	<b>Cosmetology III</b>	<b>(F,W,S)</b>	<b>2.5 (0.5-3.5)</b>
<p>This course covers principles and techniques of treatment and disorders of the hair and scalp and related chemistry, shampoos, rinses, and scalp treatments. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-12200.</p>			
<b>COS 12400</b>	<b>Cosmetology IV</b>	<b>(F,W,S)</b>	<b>2.5 (0.5-3.5)</b>
<p>This course covers the principles and techniques of wet styling, blow dry and waving, finger waving, and hairdressing. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-12300.</p>			
<b>COS 12500</b>	<b>Cosmetology V</b>	<b>(F,W,S)</b>	<b>2.5 (0.5-3.5)</b>
<p>This course covers the principles and techniques of sectioning, removing length or bulk with a razor, scissors, clippers, or shears in haircutting. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-12400.</p>			

<b>COS 12600</b>	<b>Cosmetology VI</b>	<b>(F,W,S)</b>	<b>2.5 (0.5-3.5)</b>
This course covers the principles and techniques of temporary, semi-permanent, deposit-only, and permanent colors, bleaching, tinting, toning, frosting, special effects, and problems in haircoloring. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-12500.			
<b>COS 12700</b>	<b>Cosmetology VII</b>	<b>(F,W,S)</b>	<b>2.5 (0.5-3.5)</b>
This course covers the principles and techniques of sectioning, wrapping, processing of chemicals, and rearranging the hair. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-12600.			
<b>COS 12800</b>	<b>Cosmetology VIII</b>	<b>(F,W,S)</b>	<b>2.5 (0.5-3.5)</b>
This course covers the principles and techniques of sectioning, curling, and relaxing hair as a texture service. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-12700.			
<b>COS 12900</b>	<b>Cosmetology IX</b>	<b>(F,W,S)</b>	<b>2.5 (0.5-3.5)</b>
This course covers the principles and techniques of advanced nails with nail art. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-12800.			
<b>COS 13000</b>	<b>Cosmetology X</b>	<b>(F,W,S)</b>	<b>2.5 (0.5-3.5)</b>
This course covers the principles and techniques of massage, manicuring, and pedicuring. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-12900.			
<b>COS 13100</b>	<b>Cosmetology XI</b>	<b>(F,W,S)</b>	<b>2.5 (0.5-3.5)</b>
This course covers the principles and techniques of skin chemical procedures, massage, and facial treatments. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-13000.			
<b>COS 13200</b>	<b>Cosmetology XII</b>	<b>(F,W,S)</b>	<b>2.5 (0.5-3.5)</b>
This course covers the principles and techniques of cosmetic application, artificial eyelashes, removal of unwanted hair, and lash and brow tinting. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-13100.			
<b>COS 13300</b>	<b>Cosmetology XIII</b>	<b>(F,W,S)</b>	<b>2.5 (0.5-3.5)</b>
This course covers the principles and techniques of light therapy. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-13200.			
<b>COS 13400</b>	<b>Cosmetology XIV</b>	<b>(F,W,S)</b>	<b>2.5 (0.5-3.5)</b>
This course covers the fundamentals of business management, opening a salon, and business plans. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-13300.			
<b>COS 13500</b>	<b>Cosmetology XV</b>	<b>(F,W,S)</b>	<b>2.5 (0.5-3.5)</b>
This course covers the principles and techniques of written agreements, licensing requirements and regulations, laws, salon operations, policies, practices, compensation packages, payroll deductions, telephone use, advertising, sales, communication, public/human relations, insurance, and salon safety. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-13400.			
<b>COS 13600</b>	<b>Cosmetology XVI</b>	<b>(F,W,S)</b>	<b>2.5 (0-2.5)</b>
This course covers theory review, preparation for the final test and practice of all curriculum, and a simulated state board exam. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-13500.			
<b>COS 14100</b>	<b>Skin Care I</b>	<b>(F,W,S)</b>	<b>2.5 (0.51-4)</b>
In this course, the student will learn how to have a professional image, the history of skin and its cells, and anatomy and physiology. Students will also learn bacteria classifications and safety procedures for a salon. Students must pass this course with a minimum grade of "C-" to advance to the next section.			

<b>COS 14200</b>	<b>Skin Care II</b>	<b>(F,W,S)</b>	<b>2.5 (0.51-4)</b>
In this course, the student will learn skin disorders, nutrition and health of the skin, chemistry and product ingredients, skin analysis and client consultation, and the proper draping of the client. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-14100.			
<b>COS 14300</b>	<b>Skin Care III</b>	<b>(F,W,S)</b>	<b>2.5 (0.51-4)</b>
In this course, the student will learn proper cleansing, massage and mask therapy, and how to do facials with and without the aid of machines. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-14200.			
<b>COS 14400</b>	<b>Skin Care IV</b>	<b>(F,W,S)</b>	<b>2.5 (0.51-4)</b>
In this course, the student will learn about removing unwanted hair, aging factors and cosmetic surgery effects, male skin care, aromatherapy, advanced topics, and working with a physician. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-14300.			
<b>COS 14500</b>	<b>Skin Care V</b>	<b>(F,W,S)</b>	<b>2.5 (0.51-4)</b>
In this course, the student will learn color therapy and professional makeup application techniques. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-14400.			
<b>COS 14600</b>	<b>Skin Care VI</b>	<b>(F,W,S)</b>	<b>2.5 (0.51-4)</b>
The student will learn the business part of managing a salon and the selling of products and services. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-14500.			
<b>COS 15010</b>	<b>Natural Hair Cultivation I</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
The student will learn the ancient origins of hair braiding, traditional African braid styles, what certain braid styles communicate, and the African-American hair experience, with some braiding techniques. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 15020</b>	<b>Natural Hair Cultivation II</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
The student will learn the definition and types of bacteria, how bacteria grows and reproduces, the relationship of bacteria and the spread of disease, prevention and infection control, standard sanitation practices, and how to use antiseptics, disinfectants, and detergent, techniques of braiding. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 15030</b>	<b>Natural Hair Cultivation III</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
The student will learn how to build client trust, how to maintain a professional attitude, what particular services natural hair care specialist/braid designers offer clients, and how to nurture the client's total well-being, with some braiding techniques. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 15040</b>	<b>Natural Hair Cultivation IV</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
The student will learn how to conduct a professional consultation, what questions to ask a client, how to set up a client profile card, what to look for during a hair examination, how to identify facial structures and styles that fit them, and how to advise a client appropriately, as well as some braiding techniques. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 15050</b>	<b>Natural Hair Cultivation V</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
The student will learn nurturing shampoo techniques for textured hair, how to shampoo braids, how to remove braids before shampooing for touch-ups, the different types of shampoo, and types of herbal rinses and conditioners, as well as different braiding techniques. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 15060</b>	<b>Natural Hair Cultivation VI</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
The student will learn to identify hair crafters' tools and how to handle them to create braiding styles, how to brush and comb out textured hair safely, how to section hair to prepare for various braiding designs, Shampoo and massaging techniques, and how to apply various hair oils and conditioning preparations, as well as all the different braid techniques. Students must pass this course with a minimum grade of "C-" to advance to the next section.			

<b>COS 17500</b>	<b>Salon Management</b>	<b>(F,W,S)</b>	<b>1 (1-0)</b>
In this course, the student will study all aspects of salon business operations including physical plan, furnishings and supplies, systems, personnel, and the overall function in the business community. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 20200</b>	<b>Manicure Instructor I</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
This course offers orientation and review of all subjects in the cosmetology curriculum. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 20300</b>	<b>Manicure Instructor II</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
This course provides demonstration and theory in lesson plans. Students are required to do ten lesson plans. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 20400</b>	<b>Manicure Instructor III</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
This course provides demonstration and theory in course outlines. Students are required to do five course outlines. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 20500</b>	<b>Manicure Instructor IV</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
This course provides demonstration and theory in syllabi and exam questions. The student is required to do a cosmetology syllabus and a 500-question, multiple-choice exam for graduate testing. Students must pass this course with a minimum grade of C- to advance to the next section.			
<b>COS 20600</b>	<b>Manicure Instructor V</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
This course provides demonstration and theory in teaching in a dynamic clinic, teaching to diverse learning styles. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 20700</b>	<b>Manicure Instructor VI</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
This course covers theory review, preparation for the final test and practice of all curriculum, and a simulated state board exam. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 21100</b>	<b>Cosmetology Seminar</b>	<b>(V)</b>	<b>1 (99-99)</b>
This seminar provides brush-up for licensed cosmetologists. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 21300</b>	<b>Cosmetology Seminar</b>	<b>(V)</b>	<b>4 (99-99)</b>
This seminar provides brush-up for licensed cosmetologists. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 21500</b>	<b>Dry Room Body Wraps</b>	<b>(F,W,S)</b>	<b>1 (1-0)</b>
This course will provide instruction on three body wraps, which do not require removal of products. The Siddha Body Detoxification, Herbology Body Treatment, and the Aromatherapy Body wrap will be demonstrated, along with a scalp massage. Aromatherapy oils and gem stone therapy treatments will be explored. Prerequisite: Licensure as Cosmetologist or Esthetician, or current cosmetology student.			
<b>COS 22100</b>	<b>Cosmetology Instructor I</b>	<b>(F,W,S)</b>	<b>2.5 (0.51-4)</b>
This course offers orientation and review of all subjects in the cosmetology curriculum. Prerequisite: license in cosmetology from the State of Michigan. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 22200</b>	<b>Cosmetology Instructor II</b>	<b>(F,W,S)</b>	<b>2.5 (0.51-4)</b>
This course provides demonstration and theory in lesson plans. Students are required to do ten lesson plans. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-22100.			
<b>COS 22300</b>	<b>Cosmetology Instructor III</b>	<b>(F,W,S)</b>	<b>2.5 (0.51-4)</b>
This course provides demonstration and theory in course outlines. Students are required to do five course outlines. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-22200.			

<b>COS 22400</b>	<b>Cosmetology Instructor IV</b>	<b>(F,W,S)</b>	<b>2.5 (0.51-4)</b>
This course provides demonstration and theory in syllabi and exam questions. The student is required to do a cosmetology syllabus and a 500-question, multiple-choice exam for graduate testing. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-22300.			
<b>COS 22500</b>	<b>Cosmetology Instructor V</b>	<b>(F,W,S)</b>	<b>2.5 (0.51-4)</b>
This course provides demonstration and theory in teaching in a dynamic clinic, teaching to diverse learning styles. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-22400.			
<b>COS 22600</b>	<b>Cosmetology Instructor VI</b>	<b>(F,W,S)</b>	<b>2.5 (0.51-4)</b>
This course covers theory review, preparation for the final test and practice of all curriculum, and a simulated state board exam. Students must pass this course with a minimum grade of "C-" to advance to the next section. Prerequisite: COS-22500.			
<b>COS 24100</b>	<b>Skin Care Instructor I</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
This course offers orientation and review of all subjects in the cosmetology curriculum. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 24200</b>	<b>Skin Care Instructor II</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
This course provides demonstration and theory in lesson plans. Students are required to do ten lesson plans. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 24300</b>	<b>Skin Care Instructor III</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
This course provides demonstration and theory in course outlines. Students are required to do five course outlines. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 24400</b>	<b>Skin Care Instructor IV</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
This course provides demonstration and theory in syllabi and exam questions. The student is required to do a cosmetology syllabus and a 500-question, multiple-choice exam for graduate testing. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 24500</b>	<b>Skin Care Instructor V</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
This course provides demonstration and theory in teaching in a dynamic clinic, teaching to diverse learning styles. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 24600</b>	<b>Skin Care Instructor VI</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
This course covers theory review, preparation for the final test and practice of all curriculum, and a simulated state board exam.			
<b>COS 25010</b>	<b>Natural Hair Cultivation Instructor I</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
This course offers orientation and review of all subjects in the cosmetology curriculum. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 25020</b>	<b>Natural Hair Cultivation Instructor II</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
This course provides demonstration and theory in lesson plans. Students are required to do ten lesson plans. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 25030</b>	<b>Natural Hair Cultivation Instructor III</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
This course provides demonstration and theory in course outlines. Students are required to do five course outlines. Students must pass this course with a minimum grade of "C-" to advance to the next section.			
<b>COS 25040</b>	<b>Natural Hair Cultivation Instructor IV</b>	<b>(F,W,S)</b>	<b>2.5 (1-4)</b>
This course provides demonstration and theory in syllabi and exam questions. The student is required to do a cosmetology syllabus and a 500-question, multiple-choice exam for graduate testing. Students must pass this course with a minimum grade of "C-" to advance to the next section.			

**COS 25050 Natural Hair Cultivation Instructor V (F,W,S) 2.5 (1-4)**

This course provides demonstration and theory in teaching in a dynamic clinic, teaching to diverse learning styles. Students must pass this course with a minimum grade of "C-" to advance to the next section.

**COS 25060 Natural Hair Cultivation Instructor VI (F,W,S) 2.5 (1-4)**

This course covers theory review, preparation for the final test and practice of all curriculum, and a simulated state board exam.

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## CRIMINAL JUSTICE (CJS)

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<b>CJS 10000</b>	<b>Intro to Criminal Justice</b>	<b>(F)</b>	<b>3 (3-0)</b>
<p>This course covers the history and developing philosophy of law enforcement, including the police, courts, and corrections; present organization and jurisdiction of local, state, and federal agencies; and an introduction to the problems facing the criminal justice system today. Prerequisite: permission of criminal justice advisor.</p>			
<b>CJS 10200</b>	<b>Physical Training I</b>	<b>(F,W,S)</b>	<b>3 (4-0)</b>
<p>This course is designed for the criminal justice student to participate in the state's Physical Agility Test. The student will work at developing upper-body strength, stamina, and legwork as needed to pass the different stages of the examination. Prerequisite: permission from a criminal justice advisor.</p>			
<b>CJS 10201</b>	<b>Physical Training II</b>	<b>(F,W,S)</b>	<b>3 (4-0)</b>
<p>This course is a continuation of CJS-10200. It is designed to continue the preparation of the criminal justice student planning to participate in the state's Physical Agility Test. The student will continue working on developing upper-body strength, stamina, and legwork as needed to pass the different stages of the examination. Prerequisite: CJS-10200.</p>			
<b>CJS 10202</b>	<b>Physical Training III</b>	<b>(F,W,S)</b>	<b>3 (4-0)</b>
<p>This course is a continuation of CJS-10201. It is designed to continue the preparation of the criminal justice student planning to participate in the state's Physical Agility Test. The student will continue working on developing upper-body strength, stamina, and legwork as needed to pass the different stages of the examination. Prerequisite: CJS-10201.</p>			
<b>CJS 10800</b>	<b>Firearms</b>	<b>(F,W)</b>	<b>3 (1-2)</b>
<p>This is an eight-week course that covers orientation to firearms; policies, procedures, and liability of firearms; and use and hands-on firearms range techniques using targets approved by the Michigan Commission on Law Enforcement Standards (MCOLES). Prerequisite: employment as a peace officer or status as a criminal justice student.</p>			
<b>CJS 10900</b>	<b>Intro to Corrections</b>	<b>(F)</b>	<b>3 (3-0)</b>
<p>This course introduces the agencies and processes within the correctional system, beginning with ancient history through the modern era. Correctional legislation and the courts are examined, along with the integral parts they play in sentencing, parole, probation, community corrections, and the correctional officer's professional work ethics. Prerequisite: permission of criminal justice advisor.</p>			
<b>CJS 11000</b>	<b>Careers in Criminal Justice</b>	<b>(F)</b>	<b>1 (1-0)</b>
<p>The course is designed to acquaint the student with a variety of criminal justice occupations. Prerequisite: enrollment as a criminal justice student.</p>			
<b>CJS 11100</b>	<b>Legal Issues in Corrections</b>	<b>(F)</b>	<b>3 (3-0)</b>
<p>This course is a study of up-to-date constitutional law and its impact on correctional institutions, the correctional officer, and the inmate. The student will gain a basic understanding of how state and federal court decisions pertaining to inmate rights have affected the writing of policy and procedure within the correctional system. Prerequisite: permission of criminal justice advisor.</p>			
<b>CJS 11200</b>	<b>Client Growth &amp; Development</b>	<b>(F,W,S)</b>	<b>3 (3-0)</b>
<p>This course is designed to assist the student in identifying behaviors and motivations of the inmate. Emphasis will be placed on the needs of the inmate and intervention strategies. Prerequisite: permission of criminal justice advisor.</p>			
<b>CJS 12300</b>	<b>Firearms-Concealed Weapon Program</b>	<b>(V)</b>	<b>2 (1-1)</b>
<p>This program is developed for the individual who is currently required by local gun boards to have training prior to the issuance of a concealed weapons permit. This course covers the dangers of owning and carrying a handgun, the laws of carrying, and use of the handgun (both civilly and criminally). The individual must demonstrate total understanding of the handgun owned and demonstrate proficient marksmanship qualities. Prerequisite: permission of criminal justice advisor.</p>			

- CJS 12400 Firearms - Instructor Program (V) 3 (1-2)**  
 This course is designed to instruct the student on how to become an effective firearms instructor. Topics such as the use of deadly force and the liabilities are covered, along with the five shooting fundamentals, multiple target shooting, training aids, building a proper shooting program, developing a departmental policy, positive teaching methods, use of tear gases and the dangers, as well as several other topics. Prerequisite: permission of criminal justice advisor.
- CJS 17000 Correctional Institution/Facilities (W) 3 (3-0)**  
 Included in this course will be an overview of the different levels of security and their historical development within the correctional system. Facility design, organizational structure, custody, security, and inmate due process rights will be reviewed, as well as future projections for correctional facilities and personnel. Prerequisite: permission of criminal justice advisor.
- CJS 17103 Corr Officer Report Writing w/Comp (W) 1 (1-0)**  
 The course is designed to develop and improve the student's report-writing skills that are needed in correctional institutions. The student will demonstrate the ability to communicate effectively in written form. This is an eight-week course that meets two hours per week. Students prepare their writing using microcomputers. Prerequisite: ENG-10303 or permission of the head of criminal justice.
- CJS 17200 Client Relations in Corrections (W) 3 (3-0)**  
 This course is designed to give the student an understanding of culture and discrimination. Ethics, morals, and professionalism will be examined closely. Affirmative action, social attitudes, and how they affect the correctional systems will also be carefully scrutinized. Prerequisite: permission of criminal justice advisor.
- CJS 20100 Basic Investigative Techniques (F,W) 3 (2-1)**  
 This course covers the basic skills necessary for modern criminal investigation, including the discovery, development, and lifting of latent fingerprints; the making of crime scene sketches; the use of plaster and silicone rubber for reproducing evidence at crime scenes; the use of modern investigative aids; and a grounding in the modern techniques of criminal interrogation. Prerequisite: permission of the head of criminal justice.
- CJS 208-- Criminal Justice Internship (F,W,S) 3-9**  
 After successful completion of basic criminal justice courses, students may elect criminal justice internship. Students are placed in an approved training station, earn credits for satisfactory work performance, and may earn remuneration. Participation requires approval from the director of criminal justice. Students' occupational interests are considered with their background and related classes to determine employment arrangements. Flexibility of individual programs in any of the law enforcement occupations is accomplished through a practical training program developed in agreement with the training station supervisors and college coordinator. The director shall arrange objectives and assignments that are in accord with purposes of vocational education and maintain constant evaluation through coordination visits to training stations and weekly meetings with the students. Prerequisite: first year of program completed or permission of the head of criminal justice.
- CJS 21100 Narcotics Investigation (F) 3 (3-0)**  
 This course will familiarize students with investigations involving dangerous drugs and will include history, sources, recognition, laws, and courtroom presentations. Prerequisite: permission of criminal justice advisor.
- CJS 22400 Advanced Firearms Training (F,W) 3 (1-2)**  
 The course presents the concepts and techniques related to safely using a semiautomatic pistol. The policies, procedures, and liabilities concerning the use and care of the weapon will be demonstrated by each student. The student will also demonstrate his or her proficiency with weapons using a course and targets approved by MCOLES. This is an eight-week course of which 16 hours are lecture and 32 hours are range time. Prerequisite: CJS-10800 or permission of the head of criminal justice.
- CJS 24000 Criminology (W,S) 3 (3-0)**  
 This course provides an analysis of crime, criminal behavior, and punishment through a variety of historical and contemporary theoretical perspectives. Prerequisite or corequisite: ENG-10303 or permission of instructor.

- CJS 24500 Social Deviant Behavior (W) 3 (3-0)**  
 This course studies social deviant behavior, including social and ethnic bias, sociopaths, cult behavior, and ethical behaviors within the criminal justice process. Prerequisite: PSY-10100 or SOC-10100 and permission of criminal justice advisor.
- CJS 26007 Corrections Academy (F) 10 (0-160)**  
 This course is a 160-hour Local Corrections Academy approved by the Michigan Correctional Officer's Training Council. The course will cover booking, intake and release, suicide awareness, report writing, prison behavior, correctional law, custody and security, PPCT defensive tactics, interpersonal communication, fire and safety, cultural diversity, sexual harassment, ethics, and stress management. Prerequisites: employment or sponsorship by a sheriff's department and approval of the head of criminal justice.
- CJS 26600 Police Academy (F,W) 21 (1-42)**  
 This is a 17-week, Michigan Commission on Law Enforcement Standards (MCOLES)-approved, regional police academy. It will cover investigation, patrol procedures, detention and prosecution, police skills, traffic, and special operations. Prerequisite: degree in hand, enrollment in Kirtland's pre-service program, or sponsorship by a police organization, upon approval of the director of the academy.
- CJS 27000 Community Based Corrections (F) 3 (3-0)**  
 This course surveys the history, development, techniques, and fundamentals of non-institutional correctional programs and services. Emphasis will be placed on the necessity of correctional programs to interact with other human services agencies within the community. Prerequisite: permission of criminal justice advisor.
- CJS 275-- Directed Study-Criminal Justice Administratio (V) 1-6**  
 This course is designed to meet special occupational needs for individual students. Prerequisite: permission of the head of criminal justice.
- CJS 28001 Institutional Jail & Prison Admin (W) 3 (3-0)**  
 This course provides a study of the total confinement process from arrest through administration of justice, probation, prison, and correctional institutions. Particular emphasis will be placed on coping with problems of custodial personnel in city and county jails. Prerequisite: permission of criminal justice advisor.

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## DEVELOPMENTAL (DEV)

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**DEV 06300 Basic Mathematics (F,W,S) 4 (4-0)**

Mathematical concepts involving whole numbers, fractions, decimals, percents, proportions, measurement, geometry, and elementary algebraic operations will be taught.

**DEV 07300 Basic Algebra (F,W,S) 4 (4-0)**

The fundamental operation of algebra using integers and rational numbers, exponents, linear equations, word problems, special products, factoring, and graphing of straight lines will be taught. A graphing calculator is required. Prerequisite: DEV-06300 or required COMPASS test scores.

**DEV 07400 Basic Algebra Lab (F,W,S) 1 (0-1)**

This course provides instructional support for Basic Algebra (DEV07300). Students will receive homework support and supplemental instruction. DEV07300 Basic Algebra is a corequisite of this course.

**DEV 08000 Essential Language Skills (F,W,S) 3 (3-0)**

This course is designed to meet the needs of those students who have demonstrated very low reading and writing skills. Self-paced instruction and tutorial assistance provided.

**DEV 08601 Basic Reading Skills (F,W) 3 (3-0)**

This course offers instruction in basic reading techniques to improve comprehension, vocabulary, and critical thinking skills.

**DEV 088-- Writing Mechanics (F,W) 1-3**

This course provides individualized and/or small group instruction in basic writing skills. Prerequisite: permission of the instructor.

**DEV 09000 Fund of English (F,W,S) 3 (3-0)**

This course provides instruction for freshmen who have demonstrated limited ability in communication skills. Content includes emphasis on grammar, word usage, mechanics, and basic expository writing. NOTE: Successful completion of this course is a prerequisite for ENG-10303 for students who have not demonstrated proficiency on the English placement test.

**DEV 09301 Study Skills (V) 1 (1.5-0)**

This course will assess students' study habits. Students will learn note-taking, test-taking, memory improvement, time management, and how to reduce anxiety. Students will explore college life and methods to cope with it through group counseling activities.

**DEV 09601 College Reading Skills (F,W,S) 3 (3-0)**

This course focuses on identifying each student's strengths and problems as a learner and using that information to improve reading and study skills. It also emphasizes goal setting, time management, critical reading/thinking, vocabulary building, and reading faster while understanding more.

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## **ECONOMICS (ECO)**

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**ECO 20100 Prin of Economics-MACRO (F) 3 (3-0)**

This is a one-semester basic economics course emphasizing national income determination, monetary and fiscal policy, and international trade. (This course may be taken before or after ECO-20200.) Prerequisite or corequisite: ENG-10303. Recommended Prerequisite: Sophomore standing. (Social Science Credit)

**ECO 20200 Prin of Economics-MICRO (W) 3 (3-0)**

This is a one-semester course that concentrates on supply and demand analysis, theory of the firm, and the pricing of factors of production. (This course may be taken before or after ECO-20100.) Prerequisite or corequisite: ENG-10303. Recommended Prerequisite: Sophomore standing. (Social Science Credit)

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## EDUCATION (EDU)

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**EDU 10000 Intro to Teaching (F,W) 3 (2-1)**

This course explores teaching as a career. Along with understanding the requirements of obtaining a degree and a job in teaching, students will develop a knowledge of current issues and problems in education. Observation techniques will be presented that the student will apply to guided classroom observation and participation for each student in accordance with the student's schedule. Prerequisite or corequisite: ENG-10303.

**EDU 11500 Intro to Child Growth & Development (F) 3 (3-0)**

This course focuses on child growth and development from birth to age 12 with emphasis on establishing a safe, healthy learning environment for children. Ways to support positive social development, teaching strategies for positive guidance, and establishing/maintaining a safe, healthy, appropriate learning environment will be provided.

**EDU 12000 Preschool Lesson Design & Class Mgt (F) 3 (3-0)**

This course will provide materials, knowledge, and hands-on experience in ways to nurture cognitive, motor, language, and creative process skills in children. Emphasis will be placed on advancing physical and intellectual development in young children. NOTE: A minimum of 25 hours of fieldwork required outside of class. Prerequisite or corequisite: EDU-11500.

**EDU 13000 CDA Credential Practicum (W) 3 (3-0)**

This course is designed to provide students with a vehicle for attainment of the Child Development Associate Credential. Students will by the end of the course have demonstrated through practical application and written work, competencies in thirteen functional areas of Child Development. In addition they will have completed the observations, training, and professional documentation necessary for attainment of the Child Development Associate Credential. Prerequisite: advisor or instructor approval - NOTE: The following prerequisites are required by the CDA Council to apply for CDA Certification: Must be 18 years of age or older, must have High School Diploma or GED, must be currently employed in a child care setting and have spent a minimum of 480 hours caring for children in the last five years.

**EDU 21500 Administering Preschool Programs (W) 3 (3-0)**

This course addresses program management, parent partnerships, and professionalism. Emphasis will be placed on positive and productive relations with families, ensuring a well-run and purposeful program responsive to needs and understanding professional commitment. Prerequisite: EDU-11500. Corerequisite: EDU-13000.

**EDU 24000 Technology in Education (F) 3 (3-0)**

Students will learn to operate a wide variety of technology-based equipment; select and assess instructional media materials, courseware, and software; and integrate technology and media into K-12 education.

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## **ELECTRICAL TECHNOLOGY (ELT)**

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<b>ELT 10101</b>	<b>Orientation to the Electrical Trade</b>	<b>(F,W,S)</b>	<b>0.1</b>
Provides an overview of the electrical trade and discusses the career paths available to electricians.			
<b>ELT 10102</b>	<b>Electrical Safety</b>	<b>(F,W,S)</b>	<b>0.4</b>
Covers safety rules and regulations for electricians. Teaches the necessary precautions to take for various electrical hazards found on the job. Also covers the OSHA-mandated lockout/tagout procedure. (Replaces ELT-10044).			
<b>ELT 10103</b>	<b>Introduction to Electrical Circuits</b>	<b>(F,W,S)</b>	<b>0.3</b>
Introduces series, parallel, and series-parallel circuits. Covers resistive circuits, Kirchoff's voltage and current laws, and circuit analysis. (Replaces ELT-10047).			
<b>ELT 10104</b>	<b>Electrical Theory</b>	<b>(F,W,S)</b>	<b>0.3</b>
Introduces series, parallel, and series-parallel circuits. Covers resistive circuits, Kirchoff's voltage and current laws, and circuit analysis. (Replaces ELT-10048).			
<b>ELT 10105</b>	<b>Intro to the NEC</b>	<b>(F,W,S)</b>	<b>0.3</b>
Provides a navigational road map for using the NEC. Introduces the layout of the NEC and the types of information found within the code book. Allows trainees to practice finding information using an easy-to-follow procedure. (Replaces ELT-10050).			
<b>ELT 10106</b>	<b>Device Boxes</b>	<b>(F,W,S)</b>	<b>0.4</b>
Covers the hardware and systems used by an electrician to mount and support boxes, receptacles, and other electrical components. Covers NEC® fill and pull requirements for device, pull, and junction boxes under 100 cubic inches. (Replaces ELT-10046)			
<b>ELT 10107</b>	<b>Hand Bending</b>	<b>(F,W,S)</b>	<b>0.4</b>
Provides an introduction to conduit bending and installation. Covers the techniques for using hand-operated and step conduit benders, as well as cutting, reaming, and threading conduit. (Replaces ELT-10045).			
<b>ELT 10108</b>	<b>Raceways and Fittings</b>	<b>(F,W,S)</b>	<b>0.8</b>
Introduces the types and applications of raceways, wireways, and ducts. Stresses the appropriate NEC® requirements. (Replaces ELT10051).			
<b>ELT 10109</b>	<b>Conductors and Cables</b>	<b>(F,W,S)</b>	<b>0.4</b>
Focuses on the types and applications of conductors and covers proper wiring techniques. Stresses the appropriate NEC® requirements. (Replaces ELT-10052)).			
<b>ELT 10110</b>	<b>Basic ELT Construction Drawings</b>	<b>(F,W,S)</b>	<b>0.3</b>
Focuses on electrical prints, drawings, and symbols. Teaches the types of information that can be found on schematics, one-lines, and wiring diagrams. (Replaces ELT-10053).			
<b>ELT 10111</b>	<b>Residential Electric Services</b>	<b>(F,W,S)</b>	<b>0.6</b>
Covers the electrical devices and wiring techniques common to residential construction and maintenance. Allows trainees to practice making service calculations. Stresses the appropriate NEC® requirements. (Replaces ELT-10055).			
<b>ELT 10112</b>	<b>Electrical Test Equipment</b>	<b>(F,W,S)</b>	<b>0.2</b>
Focuses on proper selection, inspection, and use of common electrical test equipment, including voltage testers, clamp-on ammeters, ohmmeters, multimeters, phase/motor rotation testers, and data recording equipment. Also covers safety precautions and meter category ratings. (Replaces ELT-10049).			

<b>ELT 10202</b>	<b>Alternating Current</b>	<b>(F,W,S)</b>	<b>0.7</b>
Focuses on forces that are characteristic of alternating-current systems and the application of Ohm's law to AC circuits. (Replaces ELT-10056).			
<b>ELT 10203</b>	<b>Motors: Theory and Application</b>	<b>(F,W,S)</b>	<b>0.8</b>
Covers AC and DC motors, including the main components, circuits, and connections. (Replaces ELT-10057).			
<b>ELT 10204</b>	<b>Electrical Lighting</b>	<b>(F,W,S)</b>	<b>0.6</b>
Introduces the basic principles of human vision and the characteristics of light. Focuses on the handling and installation of various types of lamps and lighting fixtures. (Replaces ELT-10067).			
<b>ELT 10205</b>	<b>Conduit Bending</b>	<b>(F,W,S)</b>	<b>0.6</b>
Covers all types of bends in all sizes of conduit up to 6 inches. Focuses on mechanical, hydraulic, and electrical benders. (Replaces ELT-10059).			
<b>ELT 10206</b>	<b>Pull and Junction Boxes</b>	<b>(F,W,S)</b>	<b>0.5</b>
Driven by the NEC®. Explains how to select and size pull boxes, junction boxes, and handholes. (Replaces ELT-10060).			
<b>ELT 10207</b>	<b>Conductor Installations</b>	<b>(F,W,S)</b>	<b>0.4</b>
Covers the transportation, storage, and setup of cable reels; methods of rigging; and procedures for complete cable pulls in raceways and cable trays. (Replaces ELT-10061).			
<b>ELT 10208</b>	<b>Cable Tray</b>	<b>(F,W,S)</b>	<b>0.3</b>
Focuses on NEC® installation requirements for cable tray, including cable installations. (Replaces ELT-10062).			
<b>ELT 10209</b>	<b>Conductor Terminations and Splices</b>	<b>(F,W,S)</b>	<b>0.3</b>
Describes methods of terminating and splicing conductors of all types and sizes, including preparing and taping conductors. (Replaces ELT-10063).			
<b>ELT 10210</b>	<b>Grounding and Bonding</b>	<b>(F,W,S)</b>	<b>0.6</b>
Focuses on the purpose of grounding and bonding electrical systems. Thoroughly covers NEC® requirements. (Replaces ELT-10058).			
<b>ELT 10211</b>	<b>Circuit Breakers and Fuses</b>	<b>(F,W,S)</b>	<b>0.5</b>
Describes fuses and circuit breakers along with their practical applications. Also covers sizing. (Replaces ELT-10065)/			
<b>ELT 10212</b>	<b>Control System and Concepts</b>	<b>(F,W,S)</b>	<b>0.5</b>
Gives basic descriptions of various types of contactors and relays along with their practical applications. (Replaces ELT-10066).			
<b>ELT 20303</b>	<b>Load Calculations - Branch Circuits</b>	<b>(F,W,S)</b>	<b>0.7</b>
Explains how to calculate branch circuit and feeder loads for various residential and commercial applications. (Replaces ELT-20068).			
<b>ELT 20304</b>	<b>Conductor Selection and Calculation</b>	<b>(F,W,S)</b>	<b>0.6</b>
Covers the various factors involved in conductor selection, including insulation types, current-carrying capacity, temperature ratings, and voltage drop. (Replaces ELT-20069).			
<b>ELT 20305</b>	<b>Practical Applications of Lighting</b>	<b>(F,W,S)</b>	<b>0.5</b>
Covers specific types of incandescent, fluorescent, and HID lamps, as well as ballasts, troubleshooting, and various types of lighting controls. (Replaces ELT-20082).			
<b>ELT 20306</b>	<b>Hazardous Locations</b>	<b>(F,W,S)</b>	<b>0.6</b>
Covers the NEC® requirements for equipment installed in various hazardous locations. (Replaces ELT-20080).			
<b>ELT 20307</b>	<b>Overcurrent Protection</b>	<b>(F,W,S)</b>	<b>1</b>
Explains how to size and select circuit breakers and fuses for various applications. Also covers short circuit calculations and troubleshooting. (Replaces ELT-20307).			

<b>ELT 20308</b>	<b>Distribution Equipment</b>	<b>(F,W,S)</b>	<b>0.5</b>
Discusses switchboards and switchgear, including installation, grounding, and maintenance requirements. This module includes blueprints. (Replaces ELT-20073).			
<b>ELT 20309</b>	<b>Transformers</b>	<b>(F,W,S)</b>	<b>0.5</b>
Discusses transformer types, construction, connections, protection, and grounding. (Replaces ELT-20074).			
<b>ELT 20310</b>	<b>Commerical Electrical Services</b>	<b>(F,W,S)</b>	<b>0.4</b>
Covers the components, installation considerations, and NEC® requirements for various commercial services.			
<b>ELT 20311</b>	<b>Motor Calculations</b>	<b>(F,W,S)</b>	<b>0.5</b>
Covers calculations required to size conductors and overcurrent protection for motor applications. (Replaces ELT-20076).			
<b>ELT 20312</b>	<b>Voice, Data, and Video</b>	<b>(F,W,S)</b>	<b>0.4</b>
Covers installation, termination, and testing of various voice, data, and video cabling systems.			
<b>ELT 20313</b>	<b>Motor Controls</b>	<b>(F,W,S)</b>	<b>0.5</b>
Provides information on selecting, sizing, and installing motor controllers. Also covers control circuit pilot devices and basic relay logic. (Replaces ELT-20078).			
<b>ELT 20404</b>	<b>Load Calculations - Feeder and Serv</b>	<b>(F,W,S)</b>	<b>0.8</b>
Topics include basic calculation procedures for commercial and residential applications. (Replaces ELT-20081).			
<b>ELT 20405</b>	<b>Health Care Facilities</b>	<b>(F,W,S)</b>	<b>0.4</b>
Covers the installation of electric circuits in health care facilities, including the requirements for life safety and critical circuits.			
<b>ELT 20406</b>	<b>Standby and Emergency Systems</b>	<b>(F,W,S)</b>	<b>0.4</b>
Explains the NEC® requirements for electric generators and storage batteries. (Replaces ELT-20083).			
<b>ELT 20407</b>	<b>Basic Electronic Theory</b>	<b>(F,W,S)</b>	<b>0.4</b>
Explains the function and operation of basic electronic devices, including semiconductors, diodes, rectifiers, and transistors. (Replaces ELT-20084).			
<b>ELT 20408</b>	<b>Fire Alarm Systems</b>	<b>(F,W,S)</b>	<b>0.6</b>
Covers fire alarm control units, Digital Alarm Communicator Systems (DACS), wiring for alarm initiating and notification devices, and alarm system maintenance. (Replaces ELT-20408).			
<b>ELT 20409</b>	<b>Specialty Transformers</b>	<b>(F,W,S)</b>	<b>0.4</b>
Covers various types of transformers and their applications. Also provides information on selecting, sizing, and installing these devices. (Replaces ELT-20086).			
<b>ELT 20410</b>	<b>Advanced Motor Controls</b>	<b>(F,W,S)</b>	<b>0.8</b>
Discusses applications and operating principles of solid-state controls, reduced-voltage starters, and adjustable frequency drives. Also covers basic troubleshooting procedures. (Replaces ELT-20087).			
<b>ELT 20411</b>	<b>HVAC Controls</b>	<b>(F,W,S)</b>	<b>0.6</b>
Provides a basic overview of HVAC systems and their controls. Also covers electrical troubleshooting and NEC® requirements. (Replaces ELT-20088).			
<b>ELT 20412</b>	<b>Heat Tracing and Freeze Protection</b>	<b>(F,W,S)</b>	<b>0.4</b>
Covers various heat tracing systems along with their applications and installation requirements. (Replaces ELT-20090).			
<b>ELT 20413</b>	<b>Motor Operation and Maintenance</b>	<b>(F,W,S)</b>	<b>0.4</b>
Covers motor cleaning, testing, and preventive maintenance. Also describes basic troubleshooting procedures.			
<b>ELT 20414</b>	<b>Medium Voltage Termination/Splices</b>	<b>(F,W,S)</b>	<b>0.4</b>
Offers an overview of the NEC® and cable manufacturers' requirements for medium-voltage terminations and splices.			

**ELT 20415 Special Locations (F,W,S) 0.8**

Describes the NEC® requirements for selecting and installing equipment, enclosures, and devices in various special locations including places of assembly, theaters, carnivals, agricultural buildings, marinas, temporary installations, wired partitions and swimming pools.

**ELT 20416 Introductory Skills for Crew Leader (F,W,S) 0.6**

Teaches the basic leadership skills required to supervise personnel. Discusses principles of project planning, scheduling, estimating, management, and presents several case studies for student participation.





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## ENGLISH & LITERATURE (ENG)

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- ENG 1000 Writing Lab (F,W,S) 1 (1-1)**  
This course provides personalized, competency-paced instruction in writing skills. Because this is part of the English composition requirement, most students will take this course while enrolled in ENG-10303. (Communication)
- ENG 10303 English Composition I w/Computers (F,W,S) 3 (3-0)**  
This course is a study, through extensive practice, of various modes of expression, organization, and development in expository essays, designed to develop the student's ability to think critically and write effectively. Students prepare their writing using microcomputers. Prerequisite: DEV-09000 or a satisfactory writing sample, and DEV-09601 or a satisfactory reading placement. (Communication)
- ENG 10403 English Composition II w/Computers (F,W,S) 3 (3-0)**  
A continuation of English Composition I, this course emphasizes writing analytical, critical, and argumentative essays and developing effective thinking skills. The course provides practice in library methods, research techniques, and the documented research essay. Students prepare their writing using microcomputers. Prerequisite: Satisfactory (C- or above) completion of ENG-10303. (Communication)
- ENG 10602 Technical Writing w/Computers (W) 3 (3-0)**  
A course which introduces effective organizational writing with a technical focus. Students write documents which meet the information needs of business, industrial, professional, and government organizations. Assignments include business letters, memorandums, job applications materials, technical descriptions, instructions, proposals, and short and long reports. The course provides practice in document design, library methods, research techniques, and documented research writing. Students prepare their writing using microcomputers. Prerequisite: Satisfactory (C- or above) completion of ENG-10303.
- ENG 12000 Journalism I (F,W) 3 (3-0)**  
This introduction to journalism includes techniques of news gathering and news writing as well as issues such as accuracy, fairness, laws, and ethics. Current newspaper, radio, television, and Internet news sources are also examined. Prerequisite: Satisfactory (C- or above) completion of ENG-10303 or permission of instructor. (Humanities Credit - Journalism)
- ENG 12100 Journalism II (F,W) 3 (3-0)**  
This course provides an in-depth look at journalistic news gathering and news writing. Special areas studied include police and courtroom news, sports reporting, environmental news, and opinion columns. Prerequisite: Satisfactory (C- or above) completion of ENG-10303 or permission of instructor. (Humanities Credit - Journalism)
- ENG 125-- Journalism Practicum (F,W) 1-4**  
Students work with the advisor as staff members of the college news magazine in one area of reporting, editing, photography, desktop publishing, advertising sales, or a combination of these areas. The course may be repeated up to a maximum of four credit hours. Prerequisites: ENG-12000 and ENG-12100 or permission of instructor. (Humanities Credit - Journalism)
- ENG 21400 Intro to Literature (W) 3 (3-0)**  
This course considers the expression in literature of such universal themes in human experience as the loss of innocence, the search for identity, the desire for happiness, and the confrontation with death through the study of selected essays, fiction, poetry, and drama. Prerequisite: Satisfactory (C- or above) completion of ENG-10303 or permission of instructor. (Humanities Credit - Literature)
- ENG 21500 Creative Writing (F,W) 3 (3-0)**  
This course provides study and practice of imaginative writing in poetry, fiction, and personal essay. Half the class time will be used in workshop format, sharing work for group comment and critique. The other half of class time will be used to discuss contemporary creative works and essays by writers. Prerequisite or corequisite: ENG-10303 or permission of instructor. (Humanities Credit - Creative Writing)

- ENG 22500 Contemporary Literature (S) 3 (3-0)**  
 Students will study works of selected authors of the 20th century. Prerequisite: Satisfactory (C- or above) completion of ENG-10303 or permission of instructor. (Humanities Credit - Literature)
- ENG 22800 Mythology (F) 3 (3-0)**  
 A cross-cultural and historical survey of the world's myths, the class will also consider such questions as the meaning of myth, the purposes and functions of myth, theories of how myths originate, and ways that myths have been analyzed and interpreted. Prerequisite: Satisfactory (C- or above) completion of ENG-10303. (Humanities Credit - Literature)
- ENG 23000 American Literature Before 1865 (F) 3 (3-0)**  
 This course surveys the growth and development of America's literature from its beginnings to the Civil War. Representative authors may include Bradstreet, Franklin, Irving, Cooper, Poe, Hawthorne, Thoreau, Melville, Whitman, and others. Prerequisite: Satisfactory (C- or above) completion of ENG-10303 or permission of instructor. (Humanities Credit - Literature)
- ENG 23100 American Literature After 1865 (W) 3 (3-0)**  
 This course is a survey of the growth and development of America's literature from the Civil War to the present day. Representative authors may include Twain, James, Frost, Eliot, O'Neill, Hemingway, Faulkner, Welty, Bellow, and others. Prerequisite: Satisfactory (C- or above) completion of ENG-10303 or permission of instructor. (Humanities Credit - Literature)
- ENG 23200 English Literature (F) 3 (3-0)**  
 This course will cover the major periods in English literature: Old English, Middle English, Sixteenth Century, Seventeenth Century, Restoration and Eighteenth Century, the Romantic Period, the Victorian Age, and the Modern Age. This course is designed for non-English majors, relying on class discussion with instructor lectures. Prerequisite: Satisfactory (C- or above) completion of ENG-10303 or permission of instructor. (Humanities Credit - Literature)
- ENG 251-- Topics in Literature (W) 3 (3-0)**  
 This course is a study of a significant literary topic and may cover genres, literary figures, subjects, or themes. The class may be repeated for credit if the topics are different. Prerequisite: Satisfactory (C- or above) completion of ENG-10303 or permission of instructor. (Humanities Credit - Literature)
- ENG 29100 Poetry Workshop I (W) 3 (3-0)**  
 This course is a workshop-oriented class for advanced poetry writing. Students will be expected to write poems in a variety of forms, discuss each other's work intelligently, and read contemporary poetry. Students are also expected to develop a manuscript of finished poems and work on Controlled Burn. Prerequisite: ENG-21500. (Humanities Credit - Creative Writing)
- ENG 29200 Fiction Workshop I (W) 3 (3-0)**  
 This course is a workshop-oriented class for advanced fiction writing. Students will be expected to write three to five stories in various voices or work on a novel, discuss each other's work intelligently, and read contemporary fiction. Students are also expected to develop a manuscript of fiction and work on Controlled Burn. Prerequisite: ENG-21500. (Humanities Credit - Creative Writing)
- ENG 29300 Poetry Workshop II (W) 3 (3-0)**  
 This course furthers students' pursuits in the study of poetry through workshop and in individual conferences with the instructor. Prerequisite: ENG-29100. (Humanities Credit - Creative Writing)
- ENG 29400 Fiction Workshop II (W) 3 (3-0)**  
 This course is designed to allow students to develop their craft in fiction writing through workshop and individual conferences. Prerequisite: ENG-29200. (Humanities Credit - Creative Writing)



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## **FIRE FIGHTER TRAINING (FFT)**

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**FFT 10500 Introduction to Fire Fighting (F) 3 (3-0)**

The student will review the historical practices of fire prevention; identify the roles of fire service in society, both in the public and private sector. The structure of fire service organizations and basic field equipment will be identified through lecture and discussion methods as well as field trips. Job opportunities and necessary qualifications will be addressed. Prerequisite: permission of criminal justice advisor.

**FFT 10600 Introduction to Arson Investigation (F) 3 (3-0)**

This course examines the theories of fire investigation and the role of the fire investigator. The methodology of fire investigation, motives of arsonists, fuel, incendiary fire, explosions and auto fires will be discussed, as will the formulation and testing of a hypothesis with regard to the origin and cause of a fire. Students will develop the basic knowledge of the methodology utilized by fire investigators. Prerequisite: permission of criminal justice advisor.

**FFT 10700 Fire Fighter Safety & Survival (W) 3 (3-0)**

This course introduces the basic principles and history related to the national firefighter life safety initiatives, focusing on the need for cultural and behavior change throughout the emergency services. It further broadens the scope of the national firefighter life safety initiative and emphasizes their importance at the supervisory and managerial levels.

**FFT 20500 Fire Fighter I (F) 10 (6-4)**

This course provides an introduction to basic fire suppression, prevention procedures and skill development, and is the first of two courses. This course is for students who are currently employed by a Michigan Fire Marshall recognized fire department, or currently seeking employment, and /or volunteer in a recognized fire district. This course meets the state-mandated requirements for preparing students to take the exam for state certification for entry-level on-call or volunteer fire fighters. Michigan Law mandates that persons taking this course must be at least 18 years of age and have a valid Michigan Driver's License. Prerequisites: 18 years of age; enrollment in Kirtland's fire science program; approval of director of CJ program.

**FFT 20600 Fire Fighter II (W) 10 (6-4)**

Fire Fighter II is the second of two courses. This course deals with advanced fire suppression techniques, including prevention procedures and skills development. This course is for students who are currently employed by a Michigan Fire Marshall recognized fire department, or currently seeking employment, and/or volunteer in a recognized fire district. This course meets the state-mandated requirements for preparing students to take the exam for state certification for entry-level on-call or volunteer fire fighters. Michigan Law mandates that persons taking this course must be at least 18 years of age and have a valid Michigan Driver's License. Prerequisites: Satisfactory completion of FFT-20500 Fire Fighter I; 18 years of age; enrollment in Kirtland's fire science program; approval of director of CJ program.

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## **GEOGRAPHY (GEO)**

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**GEO 1000 World Geography**

**(W,S)**

**4 (4-0)**

This course provides description and analysis of basic geographic concepts as they relate to the major world regions, and the distribution patterns of various social, economic, and cultural activities of man. Prerequisite or corequisite: ENG-10303. (Social Science Credit)

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## **GEOLOGY (GEL)**

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**GEL 10500 Physical Geology**

**(F)**

**4 (3-2)**

This lecture and laboratory course examines earth materials and the internal and external processes acting on them. Among the topics to be discussed are rocks and minerals, vulcanism, accretion, and the agents of erosion. Laboratory studies include rock and mineral identification and interpretation of topographic maps, geologic maps, and aerial photographs. (Science Credit)

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## **HEATING/VENTILATION/AC/REFRIGERATION (HVC)**

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<b>HVC 10200</b>	<b>Commercial Airside Systems</b>	<b>(F,W,S)</b>	<b>0.5</b>
Describes the systems, equipment, and operating sequences used in a variety of commercial airside system configurations, such as constant volume single-zone and multi-zone, VVT, VAV, and dual-duct VAV. (Replaces HVC-20149).			
<b>HVC 10201</b>	<b>Chimneys, Vents, and Flues</b>	<b>(F,W,S)</b>	<b>0.2</b>
Covers the principles of venting fossil-fuel furnaces and the proper methods for selecting and installing vent systems for gas-fired heating equipment. (Replaces HVC-10103).			
<b>HVC 10202</b>	<b>Intro to Hydronic Systems</b>	<b>(F,W,S)</b>	<b>0.4</b>
Introduces hot water heating systems, focusing on safe operation of the low-pressure boilers and piping systems commonly used in residential applications.			
<b>HVC 10203</b>	<b>Air Quality Equipment</b>	<b>(F,W,S)</b>	<b>0.2</b>
Covers the basic principles, processes, and devices used to control humidity and air clean-lines, as well as devices used to conserve energy in HVAC systems. (Replaces HVC-10109).			
<b>HVC 10205</b>	<b>Alternating Current</b>	<b>(F,W,S)</b>	<b>0.3</b>
Covers transformers, single-phase and three-phase power distribution, capacitors, the theory and operation of induction motors, and the instruments and techniques used in testing AC circuits and components. Also reviews electrical safety. (Replaces HVC-10105).			
<b>HVC 10206</b>	<b>Basic Electronics</b>	<b>(F,W,S)</b>	<b>0.2</b>
Explains the theory of solid-state electronics, as well as the operation, use, and testing of the various electronic components used in HVAC equipment. Includes an introduction to computers. (Replaces HVC-10106).			
<b>HVC 10207</b>	<b>Control Circuit Troubleshooting</b>	<b>(F,W,S)</b>	<b>1.2</b>
Covers the operation, testing, and adjustment of conventional and electronic thermostats, as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. Also explains how to analyze circuit diagrams for electronic and microprocessor-based controls used in comfort heating and cooling equipment and how to troubleshoot systems that use these controls. (Replaces HVC-10123).			
<b>HVC 10208</b>	<b>Troubleshooting Gas Heating</b>	<b>(F,W,S)</b>	<b>0.5</b>
Covers tools, instruments, and techniques used in troubleshooting gas heating appliances, including how to isolate and correct faults. (Replaces HVC-20141).			
<b>HVC 10209</b>	<b>Troubleshooting Cooling</b>	<b>(F,W,S)</b>	<b>0.8</b>
Covers the basic techniques and equipment used in troubleshooting cooling equipment, focusing on analyzing system temperatures and pressures in order to isolate faults. (Replaces HVC-20144).			
<b>HVC 10210</b>	<b>Heat Pumps</b>	<b>(F,W,S)</b>	<b>0.8</b>
Covers the principles of reverse cycle heating, describes the operation of the various types of heat pumps, and describes how to analyze heat pump control circuits. Includes heat pump installation and service procedures. (Replaces HVC-10112).			
<b>HVC 10211</b>	<b>Installation/Maintenance Practices</b>	<b>(F,W,S)</b>	<b>0.7</b>
Covers the application and installation of various types of fasteners, gaskets, seals, and lubricants, as well as the installation and adjustment of different types of belt drives, bearings, and couplings. Includes job documentation and customer relations. (Replaces HVC-10121).			
<b>HVC 10212</b>	<b>Sheet Metal Duct Systems</b>	<b>(F,W,S)</b>	<b>0.7</b>
Covers layout, fabrication, installation, and insulating sheet metal ductwork. Also includes selection and installation of registers, diffusers, dampers, and other duct accessories			

<b>HVC 10213</b>	<b>Fiberglass/Flex Duct Systems</b>	<b>(F,W,S)</b>	<b>0.2</b>
Covers the layout, fabrication, installation, and joining of fiberglass ductwork and fittings. Describes the proper methods for attaching and supporting flex duct.			
<b>HVC 11000</b>	<b>Intro to HVAC</b>	<b>(F,W,S)</b>	<b>0.3</b>
Covers the basic principles of heating, ventilating, and air conditioning, career opportunities in HVAC, and apprenticeship programs. (Replaces HVC-10093).			
<b>HVC 11001</b>	<b>Trade Mathematics</b>	<b>(F,W,S)</b>	<b>0.4</b>
Explains how to solve problems involving the measurement of lines, area, volume, weights, angles, pressure, vacuum, and temperature. Also introduces scientific notation, powers, roots, and basic algebra and geometry. (Replaces HVC-10094).			
<b>HVC 11002</b>	<b>Copper and Plastic Piping Practices</b>	<b>(F,W,S)</b>	<b>0.2</b>
Covers the selection, preparation, joining, and support of copper and plastic piping and fittings. (Replaces HVC-10096).			
<b>HVC 11003</b>	<b>Soldering and Brazing</b>	<b>(F,W,S)</b>	<b>0.3</b>
Covers tools, materials, and safety precautions and depicts step-by-step procedures for soldering and brazing piping. (Replaces HVC-10097).			
<b>HVC 11004</b>	<b>Ferrous Metal Piping Practices</b>	<b>(F,W,S)</b>	<b>0.2</b>
Covers various types of iron and steel pipe and fittings, and provides step-by-step instructions for cutting, threading, and joining ferrous piping. (Replaces HVC-10098).			
<b>HVC 11005</b>	<b>Basic Electricity</b>	<b>(F,W,S)</b>	<b>0.5</b>
Teaches power generation and distribution, electrical components, DC circuits, and electrical safety. (Replaces HVC-10099).			
<b>HVC 11006</b>	<b>Intro to Cooling</b>	<b>(F,W,S)</b>	<b>1.2</b>
Covers the basic principles of heat transfer, refrigeration, and pressure-temperature relationships and describes the components and accessories used in air conditioning systems. (Replaces HVC-10100).			
<b>HVC 11007</b>	<b>Intro to Heating</b>	<b>(F,W,S)</b>	<b>0.6</b>
Covers heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. (Replaces HVC-10101).			
<b>HVC 11008</b>	<b>Air Distribution Systems</b>	<b>(F,W,S)</b>	<b>0.4</b>
Describes air distribution systems and their components, air flow measurement, ductwork installation principles, and the use of instruments for measuring temperature, humidity, pressure, and velocity. (Replaces HVC-10120).			
<b>HVC 20300</b>	<b>Refrigerants and Oils</b>	<b>(F,W,S)</b>	<b>0.4</b>
Covers characteristics and applications of the current generation of refrigerants, including both pure and blended refrigerants. Also provides extensive coverage of lubricating oils used in refrigeration systems.			
<b>HVC 20301</b>	<b>Compressors</b>	<b>(F,W,S)</b>	<b>0.6</b>
Explains the operating principles of the different types of compressors used in comfort air conditioning and refrigeration systems, along with basic installation, service, and repair procedures for these compressors. (Replaces HVC-10111).			
<b>HVC 20302</b>	<b>Metering Devices</b>	<b>(F,W,S)</b>	<b>0.3</b>
Covers the operating principles, applications, installation, and adjustment of the various types of fixed and adjustable expansion devices used in air conditioning equipment. (Replaces HVC-10110).			
<b>HVC 20303</b>	<b>Retail Refrigeration</b>	<b>(F,W,S)</b>	<b>0.8</b>
Introduces the product refrigeration components and systems, such as the reach-in coolers and freezers commonly used in markets.			

<b>HVC 20304</b>	<b>Commercial Hydronic Systems</b>	<b>(F,W,S)</b>	<b>0.5</b>
Covers the various types of boilers, components, and piping systems used in commercial heating applications. Also introduces chilled water systems and their components.			
<b>HVC 20305</b>	<b>Steam Systems</b>	<b>(F,W,S)</b>	<b>0.4</b>
Covers operating principles, piping systems, components, and preventive maintenance requirements of steam systems and steam traps.			
<b>HVC 20306</b>	<b>Planned Maintenance</b>	<b>(F,W,S)</b>	<b>0.8</b>
Describes the purpose of planned maintenance and outlines the procedures for servicing gas and oil furnaces, electric heating equipment, cooling equipment, and heat pumps. (Replaces HVC-20140).			
<b>HVC 20307</b>	<b>Water Treatment</b>	<b>(F,W,S)</b>	<b>0.4</b>
Covers the kinds of water problems encountered in heating and cooling systems and identifies various water treatment methods. (Replaces HVC-20132).			
<b>HVC 20308</b>	<b>Troubleshooting Electronic Controls</b>	<b>(F,W,S)</b>	<b>0.3</b>
Explains how to analyze circuit diagrams for electronic and microprocessor-based controls used in comfort heating and cooling equipment and how to troubleshoot systems that use these controls and equipment. (Replaces HVC-20147).			
<b>HVC 20309</b>	<b>Troubleshooting Oil Heating</b>	<b>(F,W,S)</b>	<b>0.4</b>
Covers how to identify the common causes of problems in oil furnaces and offers hands-on experience in isolating and correcting oil furnace malfunctions. (Replaces HVC-20143).			
<b>HVC 20310</b>	<b>Troubleshooting Heat Pumps</b>	<b>(F,W,S)</b>	<b>0.5</b>
Reviews heat pump operation and heat pump control circuits, including how to isolate and correct faults in the heating, cooling, auxiliary heat, and defrost functions of heat pumps. (Replaces HVC-20145).			
<b>HVC 20311</b>	<b>Troubleshooting Accessories</b>	<b>(F,W,S)</b>	<b>0.4</b>
Provides hands-on lab sessions on how to troubleshoot humidifiers, electronic air cleaners, economizers, zone controls, and heat recovery ventilators. (Replaces HVC-20146).			
<b>HVC 20400</b>	<b>Construction Drawing/Specification</b>	<b>(F,W,S)</b>	<b>1</b>
Covers how to interpret the various drawings used in commercial construction, including mechanical drawings, specifications, shop drawings, and as-builts and to perform takeoff procedures for equipment, fittings, ductwork and other components. (Replaces HVC-20128).			
<b>HVC 20401</b>	<b>Air Properties and System Balancing</b>	<b>(F,W,S)</b>	<b>0.8</b>
Covers air properties and gas laws, as well as the use of psychrometric charts. It covers the tools, instruments, and methods used in balancing an air distribution system. (Replaces HVC-20150).			
<b>HVC 20402</b>	<b>Indoor Air Quality</b>	<b>(F,W,S)</b>	<b>0.6</b>
Defines the issues associated with indoor air quality and its affect on the health and comfort of building occupants. Provides guidelines for performing an IAQ survey and covers the equipment and methods used to monitor and control indoor air quality. (Replaces HVC-20129).			
<b>HVC 20403</b>	<b>Energy Conservation Equipment</b>	<b>(F,W,S)</b>	<b>0.4</b>
Covers the various heat recovery/reclaim devices, along with other energy recovery equipment used to reduce energy consumption in HVAC systems. (Replaces HVC-20130).			
<b>HVC 20404</b>	<b>Building Management Systems</b>	<b>(F,W,S)</b>	<b>0.7</b>
Explains how computers and microprocessors are used to manage zoned HVAC systems. This module has been updated to reflect new system architecture, advances in network protocols and systems controllers, and communication via Internet and wireless. (Replaces HVC-20131).			

<b>HVC 20406</b>	<b>Heating/Cooling System Design</b>	<b>(F,W,S)</b>	<b>1</b>
Identifies and explains the factors that affect heating and cooling loads, describes the process by which heating and cooling loads are calculated, and shows how load calculations are used in the selection of heating and cooling equipment. Covers types of duct systems and their selection, sizing, and installation requirements. (Replaces HVC-20134).			
<b>HVC 20407</b>	<b>Commercial/Industrial Refrigeration</b>	<b>(F,W,S)</b>	<b>0.9</b>
This module expands the study of product and process refrigeration begun in Level 3. It deals with the type of systems used in cold storage and food processing facilities, as well as transportation refrigeration. (Replaces HVC-20135).			
<b>HVC 20408</b>	<b>Alternative Heat/Cool Equipment</b>	<b>(F,W,S)</b>	<b>0.4</b>
Covers the variety of alternative devices that are used to reduce energy consumption, including wood, coal, and pellet-fired systems, waste-oil heaters, geothermal heat pumps, solar heating, in-floor radiant heating, and direct-fired makeup units.			
<b>HVC 20409</b>	<b>Introduction to Supervisory Skills</b>	<b>(F,W,S)</b>	<b>0.5</b>
Along with the principles of project planning, scheduling, and estimating, this module teaches the basic skills required for supervising personnel.			

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## HISTORY (HIS)

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**HIS 10500 History of World Societies to 1500 (F) 3 (3-0)**

This course provides a historical survey of the origins and development of human communities from their prehistoric origins to the 16th century. Emphasis is given to similarities, differences, and interrelationships among selected societies, cultures, and civilizations. Prerequisite or corequisite: ENG-10303. (Humanities Credit)

**HIS 10600 Hist of World Societies Since 1500 (W) 3 (3-0)**

This course is a historical survey of the human community from approximately 1500 to the present. Emphasis is given to the nature, cause, and consequences of the current phase of global integration. Prerequisite or corequisite: ENG-10303. (Humanities Credit)

**HIS 20100 United States History to 1865 (F) 3 (3-0)**

This course is a survey of the history of the United States from its European background through the Civil War, with special emphasis on the colonial period and the Revolution, the rise of the federal system of government, the growth of democracy, territorial expansion, sectionalism and the Civil War. Prerequisite: sophomore standing. Prerequisite or corequisite: ENG-10303. (Humanities Credit)

**HIS 20200 United States History Since 1865 (W) 3 (3-0)**

A continuation of HIS-20100, this is a survey of United States history from 1865 to the present, starting with the aftermath of the Civil War, emphasizing industrial growth, social changes, and reforms, 20th-century political trends, international commitments, and leadership. Recommended prerequisite: HIS-20100. Prerequisite or corequisite: ENG-10303. (Humanities Credit)

**HIS 20300 Michigan History (F) 3 (3-0)**

This course provides a survey of the history of Michigan from the coming of the white man. The history of the state is placed in its regional and national setting. Prerequisite or corequisite: ENG-10303 or permission of instructor. (Humanities Credit)

**HIS 20400 The American Civil War (W) 3 (3-0)**

This course examines the origins and outcomes of the sectional conflict that split the United States in two from 1861 to 1865. Emphasis is given to social, political, and military events from the 1840s to the end of Reconstruction. Prerequisite or corequisite: ENG-10303. (Humanities Credit)

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## HONORS (HON)

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**HON 225-- Honors Project**

(V)

**1-3**

A significant project over and above the typical course requirements which may be undertaken in connection with any regular Kirtland course, the Honors project may involve the student in primary or secondary research, writing, internship, service-learning opportunities, or other possible activities. All proposed honors projects must be approved by the Honors Program committee. Projects may earn from one to three credits. Students may achieve more than three credits in honors projects, but no more than three credits may be applied toward the honors degree. Prerequisites: admission to the Honors Program; permission of the instructor and the Honors Program committee.

**HON 250-- Honors Colloquium**

(W)

**3 (3-0)**

This is an interdisciplinary course that examines a significant topic or theme. Through such activities as reading, discussion, research, writing, and speaking, students will explore this topic from a variety of academic perspectives. Prerequisites: admission to the Honors Program and sophomore standing, or permission of instructor and the Honors Program committee.

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## HUMANITIES (HUM)

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**HUM 20500 The Individual and Society**

**(F,W)**

**3 (3-0)**

This course examines the perspectives of many social sciences and cultures in order to appreciate the mosaic of American and other societies from a variety of points of view. As several key current social issues and controversies are studied, students will work to illuminate an understanding of their own place in their communities, the larger society, and the modern world. Prerequisite or corequisite: ENG-10303. (Humanities Credit)

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## INDUSTRIAL MAINTENANCE (IND)

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<b>IND 10202</b>	<b>Electrical Safety</b>	<b>(F,W,S)</b>	<b>0.5</b>
<p>This course covers safety rules and regulations for electricians. Trainees learn the necessary precautions to take for various electrical hazards found on the job. This module also teaches the OSHA-mandated lockout/tagout procedure.</p>			
<b>IND 10203</b>	<b>Hand Bending</b>	<b>(F,W,S)</b>	<b>0.3</b>
<p>This course provides an introduction to conduit bending and installation. It covers the techniques for using hand-operated and step conduit benders, as well as cutting, reaming, and threading conduit.</p>			
<b>IND 10204</b>	<b>Fasteners and Anchors</b>	<b>(F,W,S)</b>	<b>0.2</b>
<p>This course covers the hardware and systems used by an electrician to mount and support boxes, receptacles, and other electrical components. It describes various types of anchors and supports, their applications, and how to install them safely.</p>			
<b>IND 10205</b>	<b>Electrical Theory One</b>	<b>(F,W,S)</b>	<b>0.3</b>
<p>This course provides a general introduction to the electrical concepts used in Ohm's Law applied to DC series circuits. Topics include atomic theory, electromotive force, resistance, and electric power equations.</p>			
<b>IND 10207</b>	<b>Electrical Test Equipment</b>	<b>(F,W,S)</b>	<b>0.3</b>
<p>This course focuses on proper selection, inspection, use, and maintenance of common electrical test equipment. Trainees get to practice using many of the instruments while learning the appropriate test procedures and safety rules.</p>			
<b>IND 10208</b>	<b>Introduction to the NEC</b>	<b>(F,W,S)</b>	<b>0.1</b>
<p>This course provides a navigational roadmap for using the NEC. Trainees are introduced to the layout of the NEC and the types of information found within the code book. Trainees are able to practice finding information using an easy-to-follow procedure.</p>			
<b>IND 10209</b>	<b>Conductors</b>	<b>(F,W,S)</b>	<b>0.6</b>
<p>This course focuses on the types and applications of conductors and covers proper wiring techniques. The appropriate NEC requirements are stressed.</p>			
<b>IND 10210</b>	<b>Intro to Electrical Blueprints</b>	<b>(F,W,S)</b>	<b>0.3</b>
<p>This course focuses on electrical prints, drawings, and symbols. Trainees learn the types of information they can find on schematics, one-lines, and wiring diagrams.</p>			
<b>IND 10211</b>	<b>Oxyfuel Cutting</b>	<b>(F,W,S)</b>	<b>0.7</b>
<p>This course explains the safety requirements for oxyfuel cutting. It identifies oxyfuel cutting equipment and setup requirements. It explains how to light, adjust, and shut down oxyfuel equipment. Trainees will perform cutting techniques that include straight line, piercing, bevels, washing, and gouging.</p>			
<b>IND 10212</b>	<b>Wiring: Commercial and Industrial</b>	<b>(F,W,S)</b>	<b>0.3</b>
<p>This course covers the electrical devices and wiring techniques common to commercial and industrial construction and maintenance. Mounting devices, making splices, and installing receptacles are all practiced in the process of learning. The appropriate NEC requirements are stressed.</p>			
<b>IND 10213</b>	<b>Alternating Current</b>	<b>(F,W,S)</b>	<b>0.6</b>
<p>This course focuses on forces that are characteristic of alternating-current (AC) systems and the application of Ohm's Law to AC circuits.</p>			
<b>IND 10214</b>	<b>Motors: Theory and Application</b>	<b>(F,W,S)</b>	<b>0.8</b>
<p>This course covers both AC and DC motors including the main parts, circuits, and connections.</p>			
<b>IND 10215</b>	<b>Grounding</b>	<b>(F,W,S)</b>	<b>0.5</b>
<p>This course focuses on the purpose of grounding and bonding electrical systems. NEC regulations are thoroughly covered.</p>			

<b>IND 10216</b>	<b>Boxes and Fittings</b>	<b>(F,W,S)</b>	<b>0.4</b>
This is an NEC-driven course that explains how to select and size outlet boxes, pull boxes, and junction boxes. Conduit bodies, as well as various types of fittings, are also covered.			
<b>IND 10218</b>	<b>Conductor Terminations and Splices</b>	<b>(F,W,S)</b>	<b>0.3</b>
This course describes methods of terminating and splicing conductors of all types and sizes, including the preparation and taping of conductors.			
<b>IND 10220</b>	<b>Circuit Breakers and Fuses</b>	<b>(F,W,S)</b>	<b>0.5</b>
This course describes fuses and circuit breakers along with their practical applications. The basis of short-circuit calculation is also covered.			
<b>IND 10221</b>	<b>Contactors and Relays</b>	<b>(F,W,S)</b>	<b>0.4</b>
This course gives basic descriptions of various types of contactors and relays, along with their practical applications.			
<b>IND 10222</b>	<b>Lubrication</b>	<b>(F,W,S)</b>	<b>0.8</b>
This course explains lubrication safety, storage, classifications, and selecting lubricants, additives, lubrication equipment, and lubricating charts.			
<b>IND 10223</b>	<b>Intro to Bearings</b>	<b>(F,W,S)</b>	<b>0.6</b>
This course introduces plain, ball, roller, thrust, guide, flanged, pillow block, and takeup bearings. It also explains bearing materials and bearing designation.			
<b>IND 10224</b>	<b>Copper and Plastic Piping Practices</b>	<b>(F,W,S)</b>	<b>0.2</b>
This course covers the selection, preparation, joining, and support of copper, plastic piping, and fittings.			
<b>IND 10225</b>	<b>Ferrous Metal Piping Practices</b>	<b>(F,W,S)</b>	<b>0.2</b>
This course covers various types of iron and steel pipe and fittings and provides step-by-step instructions for cutting, threading, and joining ferrous piping.			
<b>IND 10226</b>	<b>Piping Systems</b>	<b>(F,W,S)</b>	<b>0.2</b>
This course introduces chemical, compressed air, fuel oil, steam, and water systems, and explains how to identify piping systems according to their color codes.			
<b>IND 10227</b>	<b>SMAW Equipment and Setup</b>	<b>(F,W,S)</b>	<b>0.2</b>
This course describes shielded metal arc welding (SMAW) and welding safety. It explains how to connect welding current and set up arc welding equipment. It identifies and explains using tools for cleaning welds.			
<b>IND 20228</b>	<b>Overcurrent Protection</b>	<b>(F,W,S)</b>	<b>0.5</b>
This course stresses the use of fuses for overcurrent protection in all types of electrical systems.			
<b>IND 20230</b>	<b>Motor Controls</b>	<b>(F,W,S)</b>	<b>0.8</b>
This course begins with simple cord-and-plug motor controllers and continues through conventional controllers up to highly sophisticated electronic controls.			
<b>IND 20231</b>	<b>Motor Maintenance, Part One</b>	<b>(F,W,S)</b>	<b>0.5</b>
This course covers proper maintenance of motors in use and in storage. It includes a trouble-shooting and motor identification guide.			
<b>IND 20233</b>	<b>Installing Couplings</b>	<b>(F,W,S)</b>	<b>0.6</b>
This course identifies various types of couplings and covers installation procedures using the press-fit method and the interference-fit method. It also covers coupling removal procedures.			
<b>IND 20234</b>	<b>Installing Mechanical Seals</b>	<b>(F,W,S)</b>	<b>0.8</b>
This course covers function and advantages of mechanical seals, identifies parts and types of seals, and includes procedures for removing, inspecting, and installing mechanical seals.			

<b>IND 20235</b>	<b>Installing Belt and Chain Drives</b>	<b>(F,W,S)</b>	<b>0.4</b>
This course covers the sizes, uses, and installation procedures of six types of drive belts and two types of chain drives.			
<b>IND 20236</b>	<b>Installing Bearings</b>	<b>(F,W,S)</b>	<b>0.8</b>
This course explains how to remove, troubleshoot, and install tapered, thrust, spherical roller, pillow block, and angular contact ball bearings.			
<b>IND 20237</b>	<b>Gaskets and Packing</b>	<b>(F,W,S)</b>	<b>0.3</b>
This course teaches how to recognize various types of gaskets, gasket materials, packing, and O-rings, and how to properly install them.			
<b>IND 20238</b>	<b>Installing Seals</b>	<b>(F,W,S)</b>	<b>0.2</b>
This course covers the application, removal, and installation procedures for dynamic and static seals, O-rings, lip, cup, oil, and labyrinth seals.			
<b>IND 20239</b>	<b>Pumps</b>	<b>(F,W,S)</b>	<b>0.8</b>
This course explains centrifugal, rotary, reciprocating, metering, and vacuum pump operation and installation methods. It also covers net positive suction head and cavitation.			
<b>IND 20240</b>	<b>Basic Hydraulic Systems</b>	<b>(F,W,S)</b>	<b>0.4</b>
This course explains hydraulic system safety and basic principles of hydraulics, including Pascal's law and Bernoulli's principles. It also explains the function of fluids, parts, pumps, and motors.			
<b>IND 20241</b>	<b>Basic Pneumatic Systems</b>	<b>(F,W,S)</b>	<b>0.6</b>
This course covers pneumatic safety, characteristics of gases and how they are compressed, pneumatic transmission of energy, and compressor operation.			
<b>IND 20245</b>	<b>Advanced Controls</b>	<b>(F,W,S)</b>	<b>0.8</b>
This course explains operating principles of solid-state controls along with their practical applications. Motor braking, jogging, plugging, and safety interlocks are also covered.			
<b>IND 20246</b>	<b>Commercial &amp; Industrial Refrigerate</b>	<b>(F,W,S)</b>	<b>0.9</b>
This course covers components and operation of refrigeration systems, with emphasis on systems used in cold storage and other commercial food preservation applications. It also covers the components and operation of ice-making machines.			
<b>IND 20249</b>	<b>Conventional Alignment</b>	<b>(F,W,S)</b>	<b>1.2</b>
This course covers types of misalignment, aligning couplings using a straightedge and feeler gauge, adjusting face and OD alignment using a dial indicator, and eliminating coupling stress.			
<b>IND 20252</b>	<b>Steam Traps</b>	<b>(F,W,S)</b>	<b>0.4</b>
This course identifies types of steam traps, including mechanical, thermostatic, and thermodynamic steam traps, as well as strainers. It also explains how to install steam traps and troubleshoot steam trap systems.			
<b>IND 20253</b>	<b>Steam Systems</b>	<b>(F,W,S)</b>	<b>0.6</b>
This course covers safety procedures, turn-on, operation, and shut-down, as well as preventative maintenance procedures, piping systems associated with steam heating systems, and steam traps.			
<b>IND 20254</b>	<b>Programmable Logic Controllers</b>	<b>(F,W,S)</b>	<b>0.3</b>
This course enables the trainee to properly describe the general functions, parts, and uses of programmable logic controllers.			
<b>IND 20258</b>	<b>Preventive &amp; Predictive Maintenance</b>	<b>(F,W,S)</b>	<b>0.4</b>
This course covers nondestructive testing, ultrasonics, radiography, eddy current inspection, magnetic particle inspection, acoustic emissions, infrared testing, vibration analysis, and tribology.			
<b>IND 20259</b>	<b>Performing Reverse Alignment</b>	<b>(F,W,S)</b>	<b>1.2</b>
Using the reverse dial indicator method, trainees will identify improper pipe hanger placement, measure shaft runout, set up complex reverse dial indicator jigs, and chart alignment.			

<b>IND 20261</b>	<b>Troubleshoot &amp; Repair Pneumatic Eq</b>	<b>(F,W,S)</b>	<b>0.4</b>
This course covers how to perform preventative maintenance, inspect components, and read schematic diagrams. It also includes troubleshooting and repair procedures for pneumatic systems.			
<b>IND 20262</b>	<b>Troubleshooting &amp; Repairing Pumps</b>	<b>(F,W,S)</b>	<b>0.4</b>
This course covers how to inspect, troubleshoot, and prepare pumps for shutdown. It also includes removing pumps from the system, disassembly, and reassembly procedures.			
<b>IND 20263</b>	<b>Trbleshoot &amp; Repair Hydraulic Equip</b>	<b>(F,W,S)</b>	<b>0.4</b>
This course covers how to inspect, troubleshoot, and repair hydraulic systems and components. It also includes exercises on reading system schematic diagrams.			
<b>IND 20264</b>	<b>Troubleshooting &amp; Repair Gearboxes</b>	<b>(F,W,S)</b>	<b>0.8</b>
This course explains how to inspect, remove, reassemble, install, and maintain gearboxes. It also covers measuring and adjusting backlash and bearing clearance.			
<b>IND 20265</b>	<b>Programmable Logic Controllers</b>	<b>(F,W,S)</b>	<b>1.2</b>
This course covers the hardware and software used in modern programmable logic control systems. It also covers wiring and testing techniques.			
<b>IND 20267</b>	<b>Flow, Pressure, Level, Temperature</b>	<b>(F,W,S)</b>	<b>0.4</b>
This course presents devices used to measure flow, pressure, level, and temperature, along with their principles of operation.			
<b>IND 20269</b>	<b>Precision Measuring Tools</b>	<b>(F,W,S)</b>	<b>1</b>
This course explains how to select, inspect, use, and care for levels, feeler gauges, calipers, micrometers, height gauges and surface plates, dial indicators, protractors, parallels and gauge blocks, trammels, and pyrometers.			



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## MANUFACTURING TECHNOLOGY (MPT)

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<b>MPT 10272</b>	<b>Machine Tool Safety</b>	<b>0.17</b>
<p>Safety is the most important concern in the machine shop. This course will give you an overview of safe work practices, safe clothing, personal safety, fire prevention in the shop, hand tool safety, and machinery safety.</p>		
<b>MPT 10273</b>	<b>Identifying Surface Finishes</b>	<b>0.08</b>
<p>This course gives consideration to surface smoothness wherever two machined surfaces come into contact with each other. This packet will help the learner identify factors which contribute to the quality of surface finish and give the learner practice in identifying surface finishes.</p>		
<b>MPT 10274</b>	<b>Shop Math - Speeds and Feeds</b>	<b>0.21</b>
<p>This course will teach the learner how to accurately calculate cutting speeds, RPM, and feeds for the purpose of cutting metal.</p>		
<b>MPT 10275</b>	<b>Sharpening Drill Bits</b>	<b>0.25</b>
<p>In this course the learner will learn how to sharpen a drill bit by hand.</p>		
<b>MPT 10276</b>	<b>Drilling on a Press</b>	<b>0.17</b>
<p>In this course the learner will be taught how to drill holes in a work piece on the drill press.</p>		
<b>MPT 10277</b>	<b>Power Tap on the Drill Press</b>	<b>0.25</b>
<p>In this course the learner will be taught the proper steps and how to power tap on the drill press.</p>		
<b>MPT 10278</b>	<b>Drill Press Project</b>	<b>0.58</b>
<p>In this course the learner will use several drilling operations to complete a drill vise to print specifications.</p>		
<b>MPT 10279</b>	<b>Band Saw Blade Welding</b>	<b>0.25</b>
<p>In this course the learner will develop the skill of welding a band saw blade.</p>		
<b>MPT 10280</b>	<b>Vertical Band Saw Project</b>	<b>0.25</b>
<p>In this course the learner will be taught how to select, mount, cut and weld band saw blades. The student will also learn how to saw pieces to meet specifications.</p>		
<b>MPT 10281</b>	<b>Maintaining the Lathe</b>	<b>0.17</b>
<p>In this course the student will be introduced to the lathe, its basic parts and accessories. The student will also learn lathe safety procedures and maintenance.</p>		
<b>MPT 10282</b>	<b>Grinding Lathe Tools</b>	<b>0.25</b>
<p>In this course the student will learn how to sharpen lathe tools.</p>		
<b>MPT 10283</b>	<b>Facing on the Lathe</b>	<b>0.21</b>
<p>In this course the student will learn how to face the ends of a work piece to a specified length.</p>		
<b>MPT 10284</b>	<b>Aligning Lathe Centers</b>	<b>0.17</b>
<p>In this course the student will learn how to align the centers of the lathe using the trial cut method.</p>		
<b>MPT 10285</b>	<b>Cutting External Threads</b>	<b>0.5</b>
<p>In this course the student will learn about threads and thread forms and how to chase an external thread.</p>		
<b>MPT 10286</b>	<b>Dial In Vise/Tram in Head</b>	<b>0.21</b>
<p>In this course the student will learn the processes of a milling machine.</p>		
<b>MPT 10287</b>	<b>Fly Cutter &amp; End Mill/Square Block</b>	<b>0.21</b>
<p>In this course the student will learn how to square a block of material on all 6 sides.</p>		
<b>MPT 10288</b>	<b>Digital Read/Drill, Tap, &amp; Ream</b>	<b>0.25</b>
<p>This course will teach the learner how to use the digital readout to locate part coordinates to the print specifications.</p>		

<b>MPT 10289</b>	<b>Parallel Turning on the Lathe</b>	<b>0.21</b>
This course will instruct the learner in turning work on the lathe to "rough" and "finish" quality.		
<b>MPT 10290</b>	<b>Groove and Part on the Lathe</b>	<b>0.13</b>
This course will teach the student to cut grooves and cut off stock on the lathe.		
<b>MPT 10291</b>	<b>Cutting Internal Threads</b>	<b>0.42</b>
This course will instruct the student in how to cut internal screw threads.		
<b>MPT 10292</b>	<b>Knurling on the Lathe</b>	<b>0.13</b>
In this course the student will learn how to knurl on the lathe.		
<b>MPT 10293</b>	<b>Sharpen End Mills (End)</b>	<b>1</b>
This student will gain an understanding of the principles of sharpening the ends (of faces) of end milling cutters. This skill will be developed through reading and hands-on practice on a Cutter and Tool Grinding Machine using the associated tools and fixtures.		
<b>MPT 10295</b>	<b>Tilt Head and Turn Vise/Cut "V"</b>	<b>0.5</b>
This course will instruct the learner how to turn the swivel vise to cut a 30 degree "V" with a .250 radius and then tilt the head to cut a 90 degree "V" in a block of C.R.S. (Cold Rolled Steel), also referred to as "Mild Steel" or "Machine Steel."		
<b>MPT 10296</b>	<b>Turntable/Cut Radii</b>	<b>0.33</b>
This course will show the student how to "set-up" the turntable and cut radii.		
<b>MPT 10297</b>	<b>Sine Plate/Cut Angles</b>	<b>0.33</b>
This course will show the student how to use the sine plate accessory to cut angles on a piece of steel using the vertical milling machine.		
<b>MPT 10298</b>	<b>Boring Head/Bore 4 Holes</b>	<b>0.33</b>
This course will show how to use the boring head to bore holes into a piece of steel using the lay-out drilling machine (also called a "Jig Borer").		
<b>MPT 10299</b>	<b>Indexing Head/Key Ways</b>	<b>0.17</b>
This course will show the student how to use the indexing head to cut keyways and keyseats with a vertical milling machine. The indexing head locks in increments of 15 degrees with the locating pin, but can be set and locked at any degree with the lever lock.		
<b>MPT 10302</b>	<b>Square and Block (6 Sides)</b>	<b>0.25</b>
This course will teach the student safety precautions pertaining to grinders; how to select a grinding wheel, how to care for a grinding wheel; how to dress a grinding wheel; how to grind a magnetic chuck; how to grind a block square to print tolerances.		
<b>MPT 10303</b>	<b>Grind Angles and Radii</b>	<b>0.5</b>
This course will teach the student how to grind angles on a part by using a sine bar/sine plate; how to grind angles on a part by forming the grinding wheel; how to grind internal and external radii on a part by forming the grinding wheel with a radius dresser.		
<b>MPT 10304</b>	<b>Parallel Grind to Print</b>	<b>1</b>
This course will teach the student the proper way to parallel grind (on cylindrical grinders) by completing projects to print specifications.		
<b>MPT 10305</b>	<b>External/Internal Tapers</b>	<b>0.5</b>
This course will teach the student the proper way to grind external and internal tapers on a cylindrical grinder by completing two projects to print specifications within tolerance.		
<b>MPT 10306</b>	<b>CNC Fundamentals</b>	<b>0.83</b>
This module will provide the learner with knowledge of Computer Numerical Control (CNC) terminology and concepts.		

<b>MPT 10307</b>	<b>Geometric Dimensioning &amp; Tolerance</b>	<b>0.33</b>
This module will help the student to build the ability to read and interpret GD&T symbols which provide increased information about the function and relationship of part features.		
<b>MPT 10308</b>	<b>Micrometer</b>	<b>0.13</b>
This course will teach the student how to read micrometers, care for micrometers, name the parts which make up micrometers, know the different types of micrometers, and know the "feel" involved when using contact measuring tools.		
<b>MPT 10309</b>	<b>Calipers: Digital, Vernier, Dial</b>	<b>0.17</b>
This course will teach the student how to read calipers, how to care for calipers, the names for parts which make up callipers, and the "feel" involved when using contact measuring tools.		
<b>MPT 10310</b>	<b>Telescoping Gage</b>	<b>0.13</b>
This course will teach the learner the proper way to accurately measure holes using a telescoping gage.		
<b>MPT 10311</b>	<b>Depth Micrometer</b>	<b>0.13</b>
This course will teach the student to measure the depths of holes and steps with a depth micrometer within +/- .001.		
<b>MPT 10312</b>	<b>Dial Indicators</b>	<b>0.13</b>
This course will teach the student to use the dial indicator correctly in a machining environment.		
<b>MPT 10313</b>	<b>Gage Blocks</b>	<b>0.13</b>
This course will introduce the learner to and help use gage blocks.		
<b>MPT 10314</b>	<b>Machine Shop Trigonometry</b>	<b>0.67</b>
This course will instruct the learner in identifying different math procedures and calculations using trigonometry to solve problems.		
<b>MPT 10315</b>	<b>Height Gage</b>	<b>0.17</b>
This course will provide the learner with practice using a height gage.		
<b>MPT 10316</b>	<b>Sine Bar</b>	<b>0.17</b>
The sine bar is used to establish or check angles when an accuracy of 5 minutes or less is required. This course will teach the learner to use the sine bar for precision measurement of angles.		
<b>MPT 10317</b>	<b>CMM Fundamentals</b>	<b>0.25</b>
The student will gain an understanding of coordinate measuring machine applications and measuring techniques used in manufacturing and quality environments. The student will solve problems pertaining to coordinate systems, geometric elements, alignments, probe styles, coordinate measuring machine construction, and trends in metrology.		
<b>MPT 10318</b>	<b>CMM Part Inspection</b>	<b>0.67</b>
The student will gain an understanding of coordinate measuring machine applications and measuring techniques by performing inspections on various parts using the coordinate measuring machine, and will document dimensions of various part features. Student will practice and demonstrate measuring techniques on a manual CMM to identify numerous part geometries. Student will work with coordinate systems, geometric elements, alignments, touch probes, and CMM software.		
<b>MPT 10364</b>	<b>Cut Radius and External Tapers</b>	<b>0.5</b>
The student will learn to machine an external taper using the taper attachment.		
<b>MPT 10408</b>	<b>Math for Dividing Head</b>	<b>0.17</b>
This course will show the learner how to calculate simple and direct indexing.		
<b>MPT 10409</b>	<b>Dividing Head/Cut Gear</b>	<b>0.42</b>
This course will teach the student how to use the Dividing Head to cut a gear after preparing the work piece on the lathe and broach a keyway to fit an arbor.		

<b>MPT 20319</b>	<b>Prop of Metals/Physical Metallurgy</b>	<b>0.13</b>
This course will instruct the learner in examining and identifying the different properties of metals and their applications for different jobs.		
<b>MPT 20320</b>	<b>Constitution of Alloys</b>	<b>0.17</b>
This course will instruct the learner in examining and studying the purpose of alloys in a given material.		
<b>MPT 20321</b>	<b>Carbon and Alloy Steels</b>	<b>0.13</b>
This course will teach the student the range of possible types of steels, their properties, and their uses.		
<b>MPT 20322</b>	<b>Heat and Surface Treat for Steel</b>	<b>0.13</b>
This course will instruct the learner in examining and studying the heat treat process and what it does to metals properties.		
<b>MPT 20323</b>	<b>Cast Irons</b>	<b>0.13</b>
This course will instruct the learner in examining and identifying what makes cast iron desirable for machining and construction purposes.		
<b>MPT 20324</b>	<b>Light Metals and Alloys</b>	<b>0.13</b>
This course will provide the learner with knowledge of light metals and alloys and their applications.		
<b>MPT 20325</b>	<b>Lead, Tin, and Zinc</b>	<b>0.13</b>
This course will provide the learner with knowledge of lead, tin, and zinc, their properties, and their applications.		
<b>MPT 20326</b>	<b>Introduction to Metallurgy</b>	<b>0.46</b>
This course will assist the welding student in developing a solid background in metallurgy.		
<b>MPT 20327</b>	<b>Examining and Identifying Metals</b>	<b>0.13</b>
This course will provide information that the learner may use to examine and identify the metal being welded.		
<b>MPT 20328</b>	<b>Fund of Welding &amp; Brazing/Casting</b>	<b>0.13</b>
This course will provide information that the student may use to examine and identify cast iron.		
<b>MPT 20329</b>	<b>Fund of Welding Stainless Steel</b>	<b>0.13</b>
This course will provide information that the student may use to examine and identify stainless steel.		
<b>MPT 20330</b>	<b>Testing Metals</b>	<b>0.42</b>
This course will instruct the student in examining and identifying different inspection methods and metal processes.		
<b>MPT 20331</b>	<b>Machinery Handbook</b>	<b>0.17</b>
This module will familiarize the learner with the Machinery's Handbook.		
<b>MPT 20332</b>	<b>Machine Tool Blueprint Reading</b>	<b>0.83</b>
This module will introduce the learner to blueprints and drawing techniques which will be built upon with further modules in the program.		
<b>MPT 20333</b>	<b>Basic Shop Math</b>	<b>0.67</b>
This module will instruct the student in whole numbers, fractions, decimals, inch/millimeter conversions, and percentages.		
<b>MPT 20334</b>	<b>Machine Tool Math</b>	<b>0.75</b>
This course covers equations and formulas, exponents and roots, lines and angles, triangles, quadrilaterals, hexagons, circles, right triangles, special applications of trigonometry functions, and oblique triangles.		
<b>MPT 20335</b>	<b>Machinist Scale</b>	<b>0.08</b>
In this course the learner will develop skill in the use of the machinist's scale (rule) used for rough measurements and laying out work pieces for machining.		

<b>MPT 20336</b>	<b>Dividers</b>	<b>0.08</b>
<p>The dividers are a measuring device even though they have no scales to read. One of the important uses of the dividers is transferring measurements from a drawing to the work piece. Because of the methods used to reproduce drawings, you cannot use a machinist's scale or the dividers directly on the drawing. In this course, the learner will learn to transfer measurements from the scale to the work piece.</p>		
<b>MPT 20337</b>	<b>Spring Calipers</b>	<b>0.08</b>
<p>In this course, the learner will learn how to use the two common types of calipers, inside and outside calipers.</p>		
<b>MPT 20338</b>	<b>Combination Square</b>	<b>0.08</b>
<p>This course will instruct the learner in drawing angles and lines on a piece of metal and how to layout the center of a piece of round stock. The learner will use a set of tools called the combination square set to scribe angles and straight lines.</p>		
<b>MPT 20339</b>	<b>Legged Calipers (Hermaphrodite)</b>	<b>0.08</b>
<p>This course will teach the learner how to use the hermaphrodite caliper to scribe parallel lines and find the center of round stock.</p>		
<b>MPT 20340</b>	<b>Surface Gage</b>	<b>0.08</b>
<p>This course will instruct the learner in scribing lines on a vertical surface with a surface gauge.</p>		
<b>MPT 20366</b>	<b>EDM Fundamentals</b>	<b>0.29</b>
<p>This course examines and identifies the EDM process, applications, theory and various tooling components.</p>		
<b>MPT 20367</b>	<b>EDM Project</b>	<b>0.5</b>
<p>The student will design and build an electrode. After machining the electrode, the student will complete a project (using the electrode) in the EDM machine.</p>		
<b>MPT 20368</b>	<b>Universal Indexing Head</b>	<b>0.5</b>
<p>The milling machine has many accessories. This module will show you how to use the Universal Indexing Head. This Head can be turned 180 degrees around in increments of 15 degrees and from horizontal to perpendicular in increments of one degree.</p>		
<b>MPT 20369</b>	<b>CNC Turning</b>	<b>1.67</b>
<p>Upon completion of this module, you will be able to demonstrate competency in the following skills: safety with CNC lathes, CNC Lathe machine components, functions and operations, coordinate systems, axis addresses &amp; positioning, tooling identification, work holding, tool offsets, tool life data, operator controls, loading and editing part programs, establishing program zero, establishing the safe index point, reference point return, machine zero, machine set-up, machine start up, machine home, programming methods, modal and non-modal codes, on-line and off-line programming, reading and writing EIA/ISO part programs, reading and writing conversational part programs, cutter diameter compensation, canned cycles, circular interpolations, writing various programs and producing quality parts.</p>		
<b>MPT 20370</b>	<b>CNC Milling</b>	<b>1.67</b>
<p>Upon completion of this module, you will be able to demonstrate competency in the following skills: safety with CNC Mills, CNC Mill machine components, functions and operations, coordinate systems, axis addresses &amp; positioning, tooling identification, work holding, tool offsets, tool life data, operator controls, loading and editing part programs, establishing program zero, establishing the safe index point, reference point return, machine zero, machine set-up, machine start up, machine home, programming methods, modal and non-modal codes, on-line and off-line programming, reading and writing EIA/ISO part programs, reading and writing conversational part programs, cutter diameter compensation, canned cycles, circular interpolations, writing various programs and producing quality parts.</p>		
<b>MPT 20371</b>	<b>Precision Vise</b>	<b>2.08</b>
<p>This course will prepare you to demonstrate all of the machining skills needed to produce a precision vise that meets print specifications.</p>		
<b>MPT 20372</b>	<b>1-2-3 Blocks</b>	<b>1</b>
<p>This module will instruct the learner in all of the machining skills needed to produce 1-2-3 blocks.</p>		

<b>MPT 20373</b>	<b>Tool Makers V-Blocks</b>	<b>1.67</b>
This module will instruct the learner in all of the machining skills needed to produce Toolmakers V-Blocks.		
<b>MPT 20374</b>	<b>Transformation of American Ind. #1</b>	<b>0.33</b>
In this course the student will gain an understanding of the principles of Statistical Process Control (SPC).		
<b>MPT 20375</b>	<b>Deming on Quality &amp; Productivity #2</b>	<b>0.33</b>
In this course the student will gain an understanding of Deming's principles on quality and productivity.		
<b>MPT 20376</b>	<b>Model for Quality/Product Impvmt #3</b>	<b>0.33</b>
In this course the student will gain an understanding of the principles of a model for quality/productivity improvement.		
<b>MPT 20377</b>	<b>Project Selection #4</b>	<b>0.33</b>
In this course the student will gain an understanding of some of the principles used in project selection.		
<b>MPT 20378</b>	<b>Data Gathering &amp; Problem Solving #5</b>	<b>0.33</b>
In this course the student will gain an understanding of the principles of data gathering and problem solving.		
<b>MPT 20379</b>	<b>Data Analysis and Interpretation #6</b>	<b>0.33</b>
In this course the student will gain an understanding of data analysis and interpretation.		
<b>MPT 20380</b>	<b>Process Control X-Bar &amp; R-Charts #7</b>	<b>0.33</b>
In this course the student will gain an understanding of process control x-bar and r charts.		
<b>MPT 20381</b>	<b>Process Capability #8</b>	<b>0.33</b>
In this course the student will gain an understanding of the project implementation: process capability.		
<b>MPT 20382</b>	<b>Median and Individual Charts #9</b>	<b>0.33</b>
In this course the student will gain an understanding of the proper use of median and individual charts.		
<b>MPT 20383</b>	<b>Attribute Charts #10</b>	<b>0.33</b>
In this course the student will gain an understanding of the proper use of attribute charts.		
<b>MPT 20384</b>	<b>Project Evaluation #11</b>	<b>0.33</b>
In this course the student will gain an understanding of the principles of the project evaluation format.		
<b>MPT 20385</b>	<b>Continuing Improvement Strategy #12</b>	<b>0.33</b>
In this course the student will gain an understanding of some continuing improvement strategies.		
<b>MPT 20386</b>	<b>Reaming on the Drill Press</b>	<b>0.13</b>
This course will teach the learner to ream holes using a drill press and reamer.		
<b>MPT 20387</b>	<b>Counterbore/Sink, Spot-Face</b>	<b>0.21</b>
In this course, the learner will receive instruction in counterboring and spot facing.		
<b>MPT 20388</b>	<b>Hand Tap on the Drill Press</b>	<b>0.21</b>
In this course the learner will receive instruction on hand tapping on the drill press.		
<b>MPT 20389</b>	<b>Boring Internal Tapers</b>	<b>0.67</b>
In this course the learner will be instructed on how to bore and cut a tapered hole on the lathe.		
<b>MPT 20390</b>	<b>Lathe Project</b>	<b>1.25</b>
In this course, the learner will have an opportunity to apply the skills in lathe operation gained in previous lathe modules.		
<b>MPT 20391</b>	<b>Horizontal Milling/Saw Slot</b>	<b>0.17</b>
This course will show the learner how to set-up the horizontal attachment on a vertical milling machine and saw a slot in a piece of steel using the horizontal milling method.		

<b>MPT 20392</b>	<b>5C Collet Holders/Cut Square &amp; Hex</b>	<b>0.33</b>
This course will instruct the learner in machining a set of T-bolts to print specifications.		
<b>MPT 20393</b>	<b>Make Dove Tails</b>	<b>0.67</b>
This course will help you learn to machine external and internal dovetails.		
<b>MPT 20394</b>	<b>Mill Project</b>	<b>1.25</b>
This course will provide the learner with an opportunity to perform a variety of milling machine operations on a work piece.		
<b>MPT 20395</b>	<b>Complete Two Projects to Print</b>	<b>1.58</b>
In this course the learner will develop the skills necessary to grind complex parts to print specifications using various machines, tooling and fixturing.		
<b>MPT 20397</b>	<b>Sine Bar Project</b>	<b>0.83</b>
Upon completion of this course the learner will be able to demonstrate all of the machining skills needed to produce a Sine Bar.		
<b>MPT 20398</b>	<b>CNC Advanced Programming</b>	<b>2.08</b>
This course will instruct the learner in the proper way to successfully program a CNC machine.		
<b>MPT 20399</b>	<b>Sharpen End Mills (Sides)</b>	<b>1</b>
In this course the student will gain an understanding of the principles of sharpening the sides (or periphery) of end milling cutters.		

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## MARKETING (MKT)

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- MKT 11000 Prin of Selling** (F) 3 (3-0)  
This course covers principles and techniques employed by successful salesmen, with emphasis on how to sell rather than how to manage.
- MKT 11500 Customer Relations** (W) 3 (3-0)  
This course examines the role of Customer Relations in the economy with emphasis on customer relations in business and organizations that have considerable dealings with the public. The class addresses the four C's of excellent customer service, dealing with difficult people, handling angry customers, developing service strategies, customer service habits to develop, do's and don'ts of customer service, customer service on the web, and culminates with the student's development of a customer relations policy and program for their 'chosen' organization.
- MKT 20000 Principles of Marketing** (F) 3 (3-0)  
This course covers the managerial approach to the marketing process. This includes marketing and business management, the role of the consumer, marketing structure, merchandising, support functions, and product flow.
- MKT 20100 Prin of Retailing** (F) 3 (3-0)  
This course emphasizes the theory of retailing and its application to business problems. The course covers retail structure, consumer analysis, store operation (organization, management, and control), personnel, merchandising, and sales promotion. Students are required to complete a retail store plan.
- MKT 20200 Internet Marketing** (W) 3 (3-0)  
This course focuses on marketing in electronic environments primarily on the Internet, on one or more of its services (WWW, email), or offline by enterprises that produce and sell Internet-related products. The focus is on the synergy created when traditional marketing is performed in electronic environments and greatly reduce or eliminate time and space constraints, facilitate personalization and customization and allow the interoperability of computers and other devices.
- MKT 20400 Advertising** (W) 3 (3-0)  
This course addresses the social value of advertising and its role in marketing. Analysis of behavioral scientists' findings in regard to customer appeals and motivations, window display techniques, and principles of advertising copy and layout are conducted.
- MKT 21000 Market Research** (V) 3 (3-0)  
This course is designed to introduce the student to the problem-oriented nature of marketing research. Emphasis is given to how marketing research activities are actually implemented by professional marketing researchers. Students will be encouraged to involve themselves in a research project. Prerequisite: sophomore status or permission of advisor.

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## MASSAGE THERAPY (MAS)

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<b>MAS 10000</b>	<b>Intro to Massage Therapy</b>	<b>(F,W)</b>	<b>1 (1-0)</b>
<p>This introductory course provides the student with a basic overview of massage therapy. Through lecture, discussion, demonstration, and hands-on practice, the student will learn the benefits of massage, basic massage strokes, contraindications, and an overview of different bodywork systems. Time will also be devoted to the history and trends of massage therapy.</p>			
<b>MAS 10200</b>	<b>Intro to Clinic Operations</b>	<b>(W)</b>	<b>1 (1-0)</b>
<p>This course will prepare the student to practice in the KCC Clinic as both a massage therapist and as a receptionist. Upon completion of this course, the students will demonstrate the physical, bookkeeping, time management, client processing, and sanitation and hygiene requirements of the KCC clinic operation.</p>			
<b>MAS 10300</b>	<b>Swedish Massage I</b>	<b>(W)</b>	<b>2 (1.5-1.5)</b>
<p>Swedish massage is considered to be the foundation of most modern massage techniques. This course focuses on applying the anatomy and physiology knowledge gained in BIO-10701 and BIO-10702, as well as building skills in manipulations and the necessary support skills. These include body mechanics; positioning and draping; communication; hygiene, safety, and sanitation; sequence and flow; range of motion; and preparation for the Kirtland clinic experience. Prerequisite: BIO-10701 and BIO-10702.</p>			
<b>MAS 10400</b>	<b>Swedish Massage II</b>	<b>(S)</b>	<b>2 (1.5-1.5)</b>
<p>Swedish Massage II is a continuation of Swedish Massage I. This course is designed to build skills in manipulation and necessary support skills as described in Swedish I. This course focuses on applying the anatomy and physiology knowledge gained in ALH-12401, BIO-10701, BIO-10702, and MAS-10300 in building skills in manipulations and the necessary support skills, including body mechanics; positioning and draping; communication; hygiene, safety, and sanitation; sequence and flow; range of motion; and preparation for the KCC clinic experience.</p>			
<b>MAS 11000</b>	<b>Massage Skills Lab</b>	<b>(W)</b>	<b>1 (0-1)</b>
<p>This is a massage laboratory course designed to enable the student to practice massage skills and meet the requirements for graduation. The modular approach allows for individualized self-paced instruction. Corequisite: MAS-10300.</p>			
<b>MAS 12200</b>	<b>Clinic I</b>	<b>(S)</b>	<b>2 (0-2)</b>
<p>This laboratory experience enables the student to practice Swedish and structural-based techniques in a supervised setting. Prerequisite: MAS-10200 and MAS-12300.</p>			
<b>MAS 12300</b>	<b>Structural Based Bodywork I</b>	<b>(W)</b>	<b>1 (1-0)</b>
<p>This course will introduce the massage therapist to one of the most popular and versatile techniques—on-site, or chair, massage. Topics will include benefits of this type of massage, common conditions, special equipment and its use, techniques, managing the on-site environment, and business development. This course is recommended to professional massage therapists and individuals who have completed at least 100 hours of training. Corequisite: MAS-10200.</p>			
<b>MAS 12401</b>	<b>Structural Based Bodywork II</b>	<b>(S)</b>	<b>3 (3-0)</b>
<p>This course will introduce students to the specialty of sports/performance massage. Topics will include the benefits of sports massage, basic applications, specific techniques, and common conditions and injuries. Participation includes providing massage at the AuSable Canoe marathon. This course is recommended to professional massage therapists and individuals who have completed at least 100 hours of training. Prerequisite: MAS-12300.</p>			
<b>MAS 12500</b>	<b>Structural Based Bodywork III</b>	<b>(F)</b>	<b>1 (1-0)</b>
<p>Participants will learn patterns of body movement that promote grace and ease of movement, as well as the reduction of body stress. Prerequisite: MAS-12401.</p>			
<b>MAS 12600</b>	<b>Energy Based Bodywork I</b>	<b>(F)</b>	<b>2 (1-1)</b>
<p>This course introduces the student to energy-based bodywork techniques and their applications. Students will have an opportunity to explore systems such as reflexology, shiatsu, acupressure, therapeutic touch, and healing touch. Prerequisite: MAS-10200.</p>			

- MAS 12700 Energy Based Bodywork II (F) 2 (1-1)**  
 This course further develops the student's skill in using and integrating energy-based systems. The course includes an introduction to cranio-sacral techniques, as well as lecture, demonstration, and hands-on practice. The student will be assigned a client for a case study. Corequisite: MAS-12600.
- MAS 12801 Integrated Structural Dynamics (W) 2 (1-1)**  
 This course is designed to assist the student in gaining greater knowledge of the human musculoskeletal systems via muscle identification, palpation, and assessment of movement. The material will be integrated into the coursework throughout the program. Prerequisites: ALH-10101, BIO-10701, and BIO-10702.
- MAS 13004 Topics I (W) 1 (1-0)**  
 This course examines the issues of special populations served by the massage therapist (the elderly, the pregnant, infants, children, the disabled, survivors of abuse). Topics include appropriate techniques, common conditions, contraindications, marketing and professional development, identifying the special needs of the various populations, and practical experience under supervision.
- MAS 13005 Topics II (F) 1 (1-0)**  
 This course will familiarize the student with modalities that can be integrated into the massage treatment. Students will explore the use of aromatherapy, hot and cold treatments, hydrotherapy, and specific techniques for specific conditions. Prerequisite: MAS-10400.
- MAS 13100 Clinic II (F) 2 (0-2)**  
 This advanced laboratory experience provides an opportunity for the student to practice Swedish, structural, and energy-based massage techniques in a supervised environment. Prerequisite: MAS-12200.
- MAS 13500 Massage Practice (F) 1.5 (1.5-0)**  
 This course examines career choices as a massage therapist. Topics include employment options, client retention, record keeping, marketing, and community education.
- MAS 27500 DS-Massage Therapy I (V) 2 (2-0)**  
 This course enables the student to focus on his or her individual area of interest. Specialized areas of study and methods of study must be approved by the instructor. Prerequisite: MAS-10400 or permission of instructor.

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## MATHEMATICS (MTH)

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- MTH 11700 Mathematics / Elementary Teachers I (F) 3 (3-0)**  
A Mathematical course designed for prospective elementary teachers and for non-mathematics majors in the liberal arts curriculum. The course covers the modern concepts of mathematics taught in grades K-8. It places emphasis on set theory, problem-solving, numeration systems, operations on natural numbers and rational numbers, elementary number theory, and exercises using manipulatives. Prerequisite: ENG-10303. Corequisite: MTH12000. (Math Credit)
- MTH 12000 Intermediate Algebra (F,W,S) 4 (4-0)**  
This course includes the study of the properties of real numbers, basic concepts of algebraic operations, solving and graphing linear and nonlinear functions, systems of equations, complex numbers, quadratic functions, factoring, rational expressions, and basic interpretations of tables and graphs of data. A graphing calculator is required. Prerequisite: requisite COMPASS test scores or MTH-10100. (Math Credit)
- MTH 13000 College Algebra (F,W) 4 (4-0)**  
This is a one semester course designed to prepare students for the study of calculus. The topics to be covered include review of the fundamentals of algebra, relations, functions, solutions, of first- and second degree equations and inequalities, systems of equations, determinants, binomial theorem, mathematical induction, polynomial functions and theory of equations, analytic geometry and conic sections, geometric and arithmetical sequences and series, and miscellaneous topics. Calculators will be used for selected topics. Prerequisite: MTH-12000 or requisite COMPASS test scores. (Math Credit)
- MTH 14000 Trigonometry (F,W) 3 (3-0)**  
This course includes the study of functions and their graphs, trigonometric functions, analytic trigonometry, applications of trigonometric functions, parametric and polar functions, vectors, and analytic geometry. Prerequisite: MTH-12000. (Math Credit)
- MTH 20600 Application in Statistics (F,W) 4 (4-0)**  
This is an introductory course in statistics for any field in which the collection, analysis, interpretation, and presentation of numerical data are important. Topics include organization of data, types of distributions (binomial, normal, student t, chi-square), sampling, testing of hypotheses, confidence intervals, correlation, and regression. Additionally, the students will choose a project that will allow them to gain experience and demonstrate understanding of some of the statistical techniques or methods. A calculator is required. Computer software will be utilized. Prerequisite: MTH-12000 or higher. (Math Credit)
- MTH 21700 Mathematics/Elementary Teachers II (W) 3 (3-0)**  
The second mathematical course designed for prospective elementary teachers and for non-math majors in the liberal arts curriculum. The course covers Decimals, percent, ratio/proportions, geometry (concepts and measurement), probability, statistics, introduction to Algebra, and exercises using manipulatives. Prerequisites: ENG-10303 and MTH-12000.
- MTH 22002 Calculus I (F) 4 (4-0)**  
This is the first of a three-semester sequential course in analytic geometry and calculus. Topics include functions, limits, continuity, derivatives, integrals, and their applications. A graphing calculator is required. Prerequisite: MTH-13000 and MTH-14000; or requisite COMPASS test scores. (Math Credit)
- MTH 22102 Calculus II (W) 4 (4-0)**  
This course is a continuation of MTH-22002. Topics include applications of integration, techniques of integration, L'Hopital's Rule, improper integrals, infinite series, conic section, plane curves, parametric equations, and polar coordinates. A graphing calculator is required. Prerequisite: MTH- 22002. (Math Credit)
- MTH 22202 Calculus III (V) 4 (4-0)**  
This course is a continuation of MTH-22102. Topics include vector-valued functions, functions of several variables, multiple integration, and vector analysis. A graphing calculator is required. Prerequisite: MTH-22102. (Math Credit)

**MTH 23000 Differential Equations**

**(V)**

**4 (4-0)**

This course includes the study of exact solutions of common types of first-order ordinary differential equations, linear equations of higher order, power series solutions, Laplace transforms, linear systems including matrix methods, graphical and numerical techniques, and applications of differential equations. Prerequisite: MTH-22102. (Math Credit)

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## MUSIC (MUS)

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**MUS 10100 Music History & Appreciation (F) 3 (3-0)**

This course is a guide to listening, with emphasis on understanding and experiencing the fundamentals of music to increase the enjoyment and knowledge of music and to cultivate the art of intelligent and perceptive listening. Prerequisite or corequisite: ENG-10303. (Humanities Credit)

**MUS 10400 Piano I (W) 3 (1.5-1.5)**

This course is designed for group instruction on electronic piano. It will develop proficiency in piano playing in students who have had no experience at the keyboard. Other musical experience such as MUS-10100 is helpful but not essential. (Humanities Credit)

**MUS 10802 Contemp Acoustic Guitar Styles I (F) 2 (1-1)**

This class will teach beginners in an ensemble setting the basics of guitar styles used by today's musicians. Students will learn strumming and picking techniques along with simple major, minor and 7th chords that will allow them to accompany themselves and/or others. (Humanities Credit)

**MUS 10901 Contemp Acoustic Guitar Styles II (F) 2 (1-1)**

This class is a continuation of MUS-10802 and will teach more advanced chords, strumming and picking techniques, along with more complex chord progressions. Both rhythm and lead techniques are taught in an ensemble setting. Prerequisite: MUS-10802 or permission of instructor. (Humanities Credit)

**MUS 11500 Beginning Voice (F) 3 (3-0)**

This course provides classroom instruction in singing and vocal technique, including posture breathing, tone, song preparation, and performance. Some individual instruction, choral training, and general musicianship are also provided. The course is required of all students seeking a concentration in acting. (Humanities Credit)

**MUS 12300 Jazz History & Appreciation (W) 3 (3-0)**

This course is an in-depth study of America's only original art form through a historical and social perspective beginning with Blues and including Dixieland, swing, BeBop, and modern jazz. (Humanities credit)

**MUS 27503 DS-Intermediate Voice (F) 3 (3-0)**

This course is a continuation of MUS-11500. It provides classroom instruction in singing and vocal technique, including articulation, resonance, vocal health, vocal problem-solving, and performance. Some individual instruction, choral training, and general musicianship are also provided. Prerequisite: MUS-11500 or permission of instructor. (Humanities Credit)

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## NURSING (NUR)

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<b>NUR 10300</b>	<b>Nursing Essentials</b>	<b>(V)</b>	<b>2 (2-0)</b>
<p>A course designed to facilitate student success and progression in the nursing program and prepare Level I Nursing students for success in the pharmacology course. Prerequisite: admission into the Level I nursing program.</p>			
<b>NUR 10502</b>	<b>Foundations of Nursing</b>	<b>(V)</b>	<b>3 (3-0)</b>
<p>This is the basic course in the nursing curriculum, which provides the foundation upon which other courses will build and expand. It is designed to introduce the beginning nursing student to the philosophy and objectives of practical nursing. Content includes the scientific principles and skills concerned with basic nursing practice, with emphasis on areas of nursing skills in respect to safety, comfort, coping, and adaptation. The student is introduced to the nursing process, basic communication skills, general assessment, death and dying, and spiritual and transcultural issues. Prerequisite: admission into the nursing program.</p>			
<b>NUR 10700</b>	<b>Mental Health Concepts</b>	<b>(V)</b>	<b>1 (1-0)</b>
<p>This course is designed to assist the student nurse to develop knowledge and skills in providing basic psychiatric nursing care. The student will achieve psychosocial adaptation competencies in assisting the client with an acute or chronic mental illness, substance abuse issue, or crisis/violence need. Students will apply scientific process to problem solve client's needs. Prerequisite: admission into the nursing program.</p>			
<b>NUR 10803</b>	<b>Nursing Practice Lab</b>	<b>(V)</b>	<b>3 (0-4)</b>
<p>This course consists of guided learning lab practice. The focus is acquisition of basic nursing skills. Prerequisite: admission into the nursing program.</p>			
<b>NUR 10804</b>	<b>Nursing Clinical I</b>	<b>(V)</b>	<b>2 (0-6)</b>
<p>This course consists of guided learning clinical experience in selected health care facilities/settings. Emphasis is placed on the principles and activities concerned with basic nursing techniques that are common to the client within the health care facility. Prerequisite: admission into the nursing program.</p>			
<b>NUR 10900</b>	<b>Pharmacology I</b>	<b>(V)</b>	<b>2 (2-0)</b>
<p>A course designed to introduce the nurse to advanced concepts of drug therapy, principles and methods of drug administration and related nursing activities and responsibilities. The course is based on the pharmaco/physiological concept. Continual association to clinical experience and physiology principles serve as the foundation of the course. Prerequisite: Admission into the Nursing program. Corequisite or Prerequisite: NUR10300 Nursing Essentials.</p>			
<b>NUR 12304</b>	<b>Nursing Clinical II</b>	<b>(V)</b>	<b>5 (0-15)</b>
<p>This is a clinical course designed to introduce the student to basic concepts of using the nursing process to deliver care to adults with well-defined nursing diagnoses. Safe administration of medications will be integrated. Medical, surgical, and physiology principles serve as the foundation for the course. Application will occur in selected acute care and community sites. Prerequisite: admission into the nursing program.</p>			
<b>NUR 12503</b>	<b>Adult Medical-Surgical Nursing</b>	<b>(V)</b>	<b>4 (4-0)</b>
<p>This course introduces students to concepts focusing on how the adult responds to alterations in health. Emphasis is placed on using the nursing process as the student explores disease entities and the physiological responses of the body to these problems. This course presumes a basic understanding of normal anatomy and physiology, nutrition, and nursing foundations. Prerequisite: admission into the nursing program.</p>			
<b>NUR 12800</b>	<b>Maternal-Child Nursing Care</b>	<b>(V)</b>	<b>2 (2-0)</b>
<p>This course is designed to introduce the student to the concepts of obstetrical/pediatric nursing care. The course will include the health concerns confronting the following populations: women, pregnant client, the infant, child, and adolescent and their families, caretakers, and the community. The course presumes a basic understanding of normal anatomy and physiology. Basic concepts and principles of growth and development from conception through infancy, childhood and adolescence will be integrated throughout. Nutritional needs of these client groups and variations of diet therapy will be included. Prerequisite: admission into the nursing program. Corequisite: NUR-12304.</p>			

- NUR 13302 Current Issues in Nursing (V) 1 (1-0)**  
 This is a course designed to emphasize the responsibilities and concerns associated with a graduate practical nurse. The course will focus on employment opportunities, continuing education, professional issues, and role. Prerequisite: admission into the nursing program.
- NUR 13402 Nursing Clinical III (V) 2 (0-6)**  
 This course consists of guided learning clinical experience in selected health care facilities. Continued emphasis is placed on meeting the biopsychosocial developmental needs of the client. Role transition to graduate status is fostered. Prerequisite: admission into the nursing program.
- NUR 20900 Pharmacology II (V) 2 (2-0)**  
 A course designed to introduce the nurse to advanced concepts of drug therapy, principles and methods of drug administration and related nursing activities and responsibilities. The course is based on the pharmaco/physiological concept. Continual association to clinical experience and physiology cellular principles will be emphasized through the course. This course is designed to continue the concepts of Pharmacology I. Prerequisite: Pharmacology I.
- NUR 21400 Nursing Pharmacology (V) 2 (2-0)**  
 This course is designed to introduce the nurse to advanced concepts of drug therapy, principles and methods of drug administration, and related nursing activities and responsibilities. The course is based on the pharmaco/physiological concept. Continual association to clinical experience and physiology cellular principles will be emphasized throughout the course. Prerequisite: admission into the Level II nursing program, or permission of department.
- NUR 22001 Nursing Assessment (V) 3 (3-0)**  
 This course is designed to explore the nursing process in depth as a foundation for professional nursing practice. Methods for eliciting a sound health history and techniques for physical assessment will be introduced as a means of providing essential information for care planning. This course is designed to build on previous knowledge of the body's anatomy and physiology. Prerequisite: admission into the Level II nursing program, or permission of department.
- NUR 22201 Critical Thinking in Adult Care (V) 5 (5-0)**  
 This is a critical thinking course designed to aid the students in the use of the nursing process as it relates to adult clients with acute, chronic, and multiple health care problems. Emphasis is on a holistic approach that focuses on the adaptation of clients and significant others to alterations in the wellness-illness continuum and nursing's role in this process. Prerequisite: admission into the Level II nursing program, or permission of department.
- NUR 22300 Adult Nursing Clinical (V) 5 (0-15)**  
 This course provides the student with clinical experiences that emphasize care for adult clients with acute and chronic health care problems. Nursing interventions focus on meeting the needs of clients with multiple health problems from a holistic perspective-wellness to illness. Application of theory to practice is critical to the learning process of students in this course. Prerequisite: admission into the Level II nursing program, or permission of department.
- NUR 23200 Family Centered Pediatrics (V) 2 (2-0)**  
 This is a lecture course regarding applying the nursing process to pediatric clients and their families. The student will learn to facilitate the child and family in building, mobilizing, and using their resources in health promotion and maintenance, and managing illness. Prerequisite: admission into the Level II nursing program, or permission of department.
- NUR 24201 Community Mental Health Nursing (V) 2 (2-0)**  
 This is a course designed to develop knowledge to provide psychiatric nursing care to select clients in the hospital or community who demonstrate patterns of maladaptive behavior. The student will explore methods of prevention, maintenance, and treatment of individuals with a mental illness. Prerequisite: admission into the Level II nursing program, or permission of department.
- NUR 24302 Community Mental Health Clinical (V) 1.5 (0-4.5)**  
 Hospital and community clinical experiences are utilized to provide students opportunities to apply the nursing process to clients with maladaptive behavior. The focus is on one-to-one interpersonal relationships through which the nursing process is applied and analyzed. Prerequisite: admission into the Level II nursing program, or permission of department.

- NUR 24600 Nursing Care of Women & Families (V) 2 (2-0)**  
 This course is designed to assist the student in applying the nursing process in giving care to women, newborns, and their families, primarily during the period of childbearing. This course focuses on home care, complications of childbearing, and reproductive health. Emphasis is placed on the nurse's role in disease prevention, health promotion and maintenance, and teaching. Prerequisite: admission into the Level II nursing program, or permission of department.
- NUR 24900 Pediatric/Women's Health Clinical (V) 1.5 (0-4.5)**  
 The focus of this clinical course is to aid the student in applying the nursing process to the needs of obstetrical, female, newborn, and pediatric families. Nursing intervention in assisting the client and family to promote maximum holistic health through continuous adaptation, growth, and development in their responses to illness and stress is demonstrated. Emphasis is placed on the nurse's role of nurturing and facilitating the obstetrical, female, newborn, child, and families in building, mobilizing and using their resources in health promotion, health maintenance and managing illness. This course presumes the student has previously attained a basic level of clinical experience in obstetrical, female, newborn, and pediatric nursing and is designed to build upon that experience base. Application of obstetrical, female, newborn and family-centered pediatrics nursing care will occur in selected hospital or community based settings. Prerequisite: admission into the Level II nursing program. Corequisite: NUR23200 and NUR24600.
- NUR 25201 Professional Practice (V) 2 (2-0)**  
 This course is designed to assist the transition of the student nurse to graduate nurse. Professional nursing behaviors and attitudes are explored. Health care systems, nursing personnel and roles, staffing, and other professional issues are examined and evaluated. Prerequisite: admission into the Level II nursing program, or permission of department.
- NUR 26001 Nursing Care of Adults (V) 8 (8-0)**  
 This course is designed to facilitate the student in using the nursing process to give care to adults who are acutely or chronically ill or who have multiple health problems. Nursing interventions to assist the client and family in their holistic adaptive responses to illness and stress are discussed. Emphasis is placed on the nurse's role in health care management (disease prevention, health promotion and maintenance, and teaching). Information is designed to build upon the theory learned in all completed coursework and will enable the student to apply previously learned knowledge and skills. Prerequisite: admission into program.
- NUR 27200 Nursing Care of Special Pops - OB (V) 2 (2-0)**  
 This is a course designed to facilitate the student in using the nursing process to give care to special populations (mental illness, childbearing family, and childrearing family). Nursing interventions to assist the client and family in their holistic adaptive responses to growth and development, illness, and stress are discussed. Emphasis is placed on the nurse's role in health care management (disease prevention, health promotion and maintenance, and teaching). Knowledge is demonstrated by the safe and effective clinical care to clients in various settings. Prerequisite: admission into program and PSY-10100.
- NUR 27400 Nursing Care of Special Pops - Peds (V) 2**  
 This is a course designed to facilitate the student in using the nursing process to give care to special populations (mental illness, childbearing family, and childrearing family). Nursing interventions to assist the client and family in their holistic adaptive responses to growth and development, illness, and stress are discussed. Emphasis is placed on the nurse's role in health care management (disease prevention, health promotion and maintenance, and teaching). Knowledge is demonstrated by the safe and effective clinical care to clients in various settings. Prerequisite: admission into program and PSY-10100.
- NUR 27600 Nursing - Special Pops/Mental Hlth (V) 4**  
 This is a course designed to facilitate the student in using the nursing process to give care to special populations (mental illness, childbearing family, and childrearing family). Nursing interventions to assist the client and family in their holistic adaptive responses to growth and development, illness, and stress are discussed. Emphasis is placed on the nurse's role in health care management (disease prevention, health promotion and maintenance, and teaching). Knowledge is demonstrated by the safe and effective clinical care to clients in various settings. Prerequisite: admission into program and PSY-10100.

**NUR 28000 Clinical Application / Nursing Care (V) 8 (8-0)**

This is a clinical course that focuses on the practice of nursing in selected settings (in-patient, out-patient, and community settings) and with varying client populations. Students apply nursing process to assist clients and families to achieve maximum holistic health through continuous adaptation and growth and development. Students will manage care for increasing numbers of clients within selected settings. Communication skills with clients, peers, and the health care team are emphasized, as are professional nursing behaviors. Knowledge is demonstrated by the safe and effective clinical care to clients in the mental health, childbearing, childrearing, and medical-surgical settings over 15 weeks of clinical experience. Prerequisites: NUR-22001, NUR-26001, NUR-27000, and Nursing Leadership (NURS 290.L1)

**NUR 29000 Nursing Leadership (W) 3 (3-0)**

This course explores the professional nurse's role in management including priority setting, delegation, supervision, and resource management in the health care setting. Content includes leadership issues, career development, and current health care trends. Prerequisites: NUR26001 & NUR22001. Corerequisites: NUR27200, NUR27400, and NUR27600.

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## OFFICE INFORMATION SYSTEMS (OIS)

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<b>OIS 10100</b>	<b>Basic Keyboarding</b>	<b>(F,W,S)</b>	<b>1</b>
This course is for those who have not had any previous keyboarding instruction.			
<b>OIS 10401</b>	<b>Keyboarding I-A</b>	<b>(F,W,S)</b>	<b>1</b>
Students will be using a microcomputer and appropriate software to develop touch-type operation of the keyboard and drill work to develop their keyboarding skills.			
<b>OIS 10402</b>	<b>Keyboarding I-B</b>	<b>(F,W,S)</b>	<b>1</b>
Students will be using a microcomputer and appropriate software to develop touch-type operation and basic skills in keyboarding, including the numeric keypad and the ability to prepare memorandums and business letters. Review and drill work are also incorporated into the course.			
<b>OIS 10403</b>	<b>Keyboarding I-C</b>	<b>(F,W,S)</b>	<b>1</b>
Students will be using a microcomputer and appropriate software to develop basic skills in keyboarding, including touch-type operation of the keyboard, and the ability to prepare simple business letters, reports, manuscripts, and outlines. Review and drill work are available for those students who have previously developed some keyboarding skill.			
<b>OIS 10500</b>	<b>Business Correspondence</b>	<b>(F,W,S)</b>	<b>3</b>
Detailed examination of methods of communication in business. Instruction and practice in writing and constructing rough drafts, finished letters and forms used in business. Includes grammatical and mechanical foundation for preparing business correspondence with emphasis on successful human relations. Employability skill, including letters of appreciation, application forms, and interview techniques are presented. The course also includes a documented research paper. Prerequisite: ENG-10303.			
<b>OIS 10600</b>	<b>Intro to Health Information Systems</b>	<b>(F,W,S)</b>	<b>3</b>
This course is designed to introduce the student to health information systems from a broad view of the health care industry to the basic elements of health information technology, through the physician's office, acute care setting, and other health care environments. A complete integration of computer-based terminology and concepts will be addressed as it relates to health information technology. The course includes the practical application of various health information functions.			
<b>OIS 10701</b>	<b>Medical Office Transcription-A</b>	<b>(F,W,S)</b>	<b>1</b>
This introductory course is designed to expose the student to the beginning stages of medical transcription. The student will learn the different tools of transcription, how to operate the different types of dictation and transcription equipment, how to use the reference materials in terms of punctuation and transcribing numbers. Basic transcription will be introduced. Corequisites: ALH-10101; OIS-11401 or OIS-18201 or equivalent; or permission of advisor.			
<b>OIS 10702</b>	<b>Medical Office Transcription-B</b>	<b>(F,W,S)</b>	<b>1</b>
This course is designed to expose the student to formatting transcription letters and to developing proofreading skills. Guidelines will be introduced for style, grammar, and specific medical transcription mechanics such as editing, spelling, and formatting of medical reports. Intermediate transcription skills will be developed upon completion of this course. Prerequisites: OIS-10701.			
<b>OIS 10703</b>	<b>Medical Office Transcription-C</b>	<b>(F,W,S)</b>	<b>1</b>
This course exposes the student to identifying the various mechanical formats used to prepare the diverse medical reports used in transcribing. Upon completion of this course, the student will be typing reports, memos, minutes, and agendas. Advanced transcription skills will be developed upon completion of this course. Prerequisites: OIS-10702 or equivalent.			
<b>OIS 10800</b>	<b>Medical Transcription I</b>	<b>(F,W,S)</b>	<b>3</b>
Transcription of authentic physician-dictated reports organized by body systems or medical specialties. Emphasis on development of accuracy, speed, and medical knowledge for transcription of letters, chart notes, history and physical examination reports, consultations, emergency room reports, operative reports, discharge summaries, laboratory reports, diagnostic studies, radiology and pathology reports. Using reference materials and other resources efficiently. Editing and proofreading techniques. Grammar and punctuation review. Prerequisites: ENG-10303, and OIS-10703 or equivalent.			

<b>OIS 11201</b>	<b>Business Calculations</b>	<b>(F,W,S)</b>	<b>3</b>
The student will learn how to add, subtract, multiply, and divide to complete various business application problems using an electronic calculator and the microcomputer ten-key pad.			
<b>OIS 11300</b>	<b>Medical Coding I</b>	<b>(F,W)</b>	<b>3</b>
This course includes the study and practical application of coding medical diagnoses and procedures from medical record documentation using CPT-4 coding systems. The student will review medical records to identify the key components of documentation that are used in the coding and documentation process. Prerequisite: ALH-10101.			
<b>OIS 11401</b>	<b>Keyboarding II-A</b>	<b>(F,W,S)</b>	<b>1</b>
This course is designed to increase speed and accuracy in the preparation of keyed projects. The student will be introduced to memorandums and e-mail, personal and business letters, and tables. Prerequisite: OIS-10403 or equivalent, or permission of advisor.			
<b>OIS 11402</b>	<b>Keyboarding II-B</b>	<b>(F,W,S)</b>	<b>1</b>
This course is designed to increase speed and accuracy in the preparation of business reports and letters. The student will be introduced to various letter styles, forms, manuscripts, and tabulation problems. Prerequisite: OIS-11401 or equivalent.			
<b>OIS 11403</b>	<b>Keyboarding II-C</b>	<b>(F,W,S)</b>	<b>1</b>
This course is designed to increase speed and accuracy in the preparation of business reports and letters. The student will be introduced to various letter styles, forms, manuscripts, and tabulation problems. Prerequisite: OIS-11402 or equivalent.			
<b>OIS 11500</b>	<b>Medical Billing &amp; Coding</b>	<b>(F,W)</b>	<b>3</b>
This course provides students with the knowledge and skills necessary to perform the duties of an Insurance Billing Specialist. This includes reviewing and completing health insurance forms properly and accurately abstracting with the appropriate diagnoses and procedure codes. Students will prepare and organize patient charts, bills, ledgers, and encounter forms. Prerequisite: ALH-10101 or permission of advisor.			
<b>OIS 17000</b>	<b>Legal Terminology &amp; Transcription</b>	<b>(F,W)</b>	<b>3</b>
This course is designed to give the student a background in basic legal terminology including spelling, pronunciation, and meaning. The student will develop transcription skills by transcribing from taped dictation documents dealing with the courts, legal systems, and litigation procedures. Prerequisites: ENG-10303 and OIS-10403. Corequisites: OIS11401 or higher.			
<b>OIS 18201</b>	<b>Word Processing I-Word-A</b>	<b>(F,W,S)</b>	<b>1</b>
This course is designed to provide students with a knowledge of word processing concepts, equipment, and the ability to perform word processing operations using a word processing system. The student will perform basic word processing functions including inputting, formatting, editing, and printing.			
<b>OIS 18202</b>	<b>Word Processing I-Word-B</b>	<b>(F,W,S)</b>	<b>1</b>
This course is designed to provide students with a knowledge of word processing concepts, equipment, and the ability to perform word processing operations using a word processing system. The student will perform basic word processing functions including inputting, formatting, editing, saving, retrieving, creating, printing, maintaining files, using writing tools, using tabs, and manipulating text. Prerequisite: OIS-18201.			
<b>OIS 18203</b>	<b>Word Processing I-Word-C</b>	<b>(F,W,S)</b>	<b>1</b>
This course is designed to provide students with a knowledge of word processing concepts, equipment, and the ability to perform word processing operations using a word processing system. The student will perform basic word processing functions including inputting, formatting, editing, printing, maintaining files, using writing tools, using tabs, and manipulating text. Prerequisite: OIS-18202.			
<b>OIS 19001</b>	<b>Machine Transcription-A</b>	<b>(F,W,S)</b>	<b>1</b>
This is an introductory course, which teaches the basic skills needed to operate a transcribing machine. Emphasis is placed on listening skills, proofreading, and applying the principles of correct grammar to the transcription of letters and memorandums. Prerequisites: ENG-10303; OIS-11401 or OIS-18201 or equivalent. Corequisites: OIS11401 or OIS18201.			

<b>OIS 19002</b>	<b>Machine Transcription-B</b>	<b>(F,W,S)</b>	<b>1</b>
This intermediate course introduces dictation of documents requiring document-formatting decisions. Emphasis continues to be placed on listening skills, use of proper punctuation, and accurate proofreading techniques. Prerequisites: OIS-19001 or equivalent.			
<b>OIS 19003</b>	<b>Machine Transcription-C</b>	<b>(F,W,S)</b>	<b>1</b>
This course requires the student to apply the basic skills acquired in OIS-19001 and OIS-19002 to dictation of increasing difficulty. Grammar, spelling, formatting, and editing decisions will be more challenging. Prerequisites: OIS-19002 or equivalent.			
<b>OIS 20501</b>	<b>Records Management-A</b>	<b>(F,W,S)</b>	<b>1</b>
This course is an introduction to the basic principles, procedures, and methods of records storage, control, retrieval, and management. Practical applications of manual filing are utilized to assist students in mastering the rules and principles of alphabetic filing.			
<b>OIS 20502</b>	<b>Records Management-B</b>	<b>(F,W,S)</b>	<b>1</b>
This course expands on the introductory course by reviewing the basics of alphabetic filing through additional practical applications. Emphasis is placed on procedures for efficient records retention, retrieval, and transfer procedures. Prerequisite: OIS-20501.			
<b>OIS 20503</b>	<b>Records Management-C</b>	<b>(F,W,S)</b>	<b>1</b>
This course provides the student with advanced training in records management, which includes principles and practical applications of subject, numeric, and geographic filing. For enhancement of records management techniques, an interview with a records manager in an off-campus business will be conducted by the student. Prerequisite: OIS-20502.			
<b>OIS 20600</b>	<b>Medical Transcription II</b>	<b>(F,W,S)</b>	<b>3</b>
This course will expand the transcription skills of the student by the use of dictation in the specialty areas of medicine and will include dictation by heavily accented English-speaking people. The students will further develop their skill in efficient usage of reference materials.			
<b>OIS 20700</b>	<b>Medical Transcription III</b>	<b>(F,W,S)</b>	<b>3</b>
This machine transcription course will required the student to develop an employable production speed while transcribing a variety of medical documents dealing with the specialty areas of medicine and advanced terminology. Dictation by persons with foreign accents will be incorporated into this class.			
<b>OIS 21000</b>	<b>Office Procedures</b>	<b>(F,W,S)</b>	<b>3</b>
This course provides the application and combination of previously learned skills. It introduces the application of standard office procedures and practices. Emphasis is on the production of quality materials suitable for actual use, with further emphasis on the development of acceptable personal attitudes and personality. The course also includes a review of employability skills. Prerequisites: ENG-10303; and OIS-11403 and OIS-18203 and OIS-19003, or equivalent.			
<b>OIS 21100</b>	<b>Medical Office Procedures</b>	<b>(F,W,S)</b>	<b>3</b>
This course is a concentrated application of various tasks that a medical clerk/secretary performs, including administrative responsibilities, preparing and organizing patient charts, medical ethics and law, Internet projects, telephone procedures, appointments, and records management. The use of the computer is emphasized in each of these applications. Prerequisites: ALH-10101 and ENG-10303; or equivalent.			
<b>OIS 21300</b>	<b>Medical Coding II</b>	<b>(F,W,S)</b>	<b>3</b>
This course includes the advanced study and practical application of coding medical diagnoses and procedures from medical record documentation using ICD-9-CM and CPT-4. The student will achieve a thorough understanding of the impact of coding on all aspects of the reimbursement process. Prerequisite: OIS-11300.			
<b>OIS 21400</b>	<b>Keyboarding III</b>	<b>(F,W,S)</b>	<b>3</b>
This course provides application and study in the preparation of common and specialized letters, business forms, legal papers, and correct office methods and procedures. Also, typing of specialized forms in accounting, government, and professional and technical fields is taught. Prerequisite: OIS-11403 and OIS-18203, or equivalent.			

- OIS 21500 Desktop Publishing for the Office (F,W,S) 3**  
 This is a course designed to study the technology of desktop publishing. A word processing program will be used to create documents such as reports, brochures, advertisements, newsletters, flyers, and correspondence. Advanced features will also be taught; therefore, the student will acquire a skill that is valuable in both small and large offices. Prerequisites: CIS-10500 and OIS-22200 or equivalent; or permission of advisor. Corequisites: OIS11403.
- OIS 22100 Office Pharmacology (W) 2**  
 This course is designed for the medical secretary or transcriptionist and will focus on drugs prescribed and/or dispensed in the office setting, patient instructions, reporting reactions, and storage. Emphasis will be placed on correct spelling and transcription of prescribed medications. Prerequisites: ALH-10101, BIO-10701, and BIO-10702, or permission of advisor. Prerequisite or corequisite: ALH-11201.
- OIS 22200 Word Processing II-Word (F,W,S) 3**  
 This course is designed to provide advanced applications of the word processing system and program used in OIS-18203. The student will demonstrate proficiency in advanced word processing applications including power typing, creation of documents, and enhancement to promote efficiency. Prerequisite: OIS-18203.
- OIS 22500 Legal Office Procedures (F,W) 3**  
 This course is designed to provide students with fundamental concepts of American jurisprudence, and practical application of tasks that will be required in a legal office setting. Prerequisites: BUS-10100, BUS-21500, and OIS-17000 with a grade of "C" or better. Corequisites: OIS11403.
- OIS 24101 Internship-Administrative Asst (F,W,S) 3**  
 The externship consists of 128 hours of directed office work experience consisting of supervised secretarial duties in a suitable office facility either on or off campus. Prerequisites: completion of all courses required for program, a GPA of 2.0 or better, and permission of advisor.
- OIS 24102 Internship-Legal Secretary (F,W,S) 3**  
 The externship consists of 128 hours of directed office work experience consisting of supervised legal secretarial duties in a suitable legal office. Prerequisites: completion of all courses required for program, a GPA of 2.0 or better, and permission of advisor.
- OIS 24103 Internship-Medical Secretary (F,W,S) 3**  
 The externship consists of 128 hours of directed office work experience consisting of supervised medical secretarial duties in a suitable medical facility. Prerequisites: completion of all courses required for program, a GPA of 2.0 or better, and permission of advisor.
- OIS 24106 Internship-Medical Transcription (F,W,S) 4**  
 This externship consists of coordinated, directed, on-site training under the supervision of a qualified medical record administrator in an office specializing in medical transcription. The externship will involve 144 hours of work experience transcribing the basic four reports (history and physical, consultation, operative report, and discharge summary), as well as other specialty area transcription. A transcription project will be developed along with a transcription procedures manual. Prerequisites: completion of all courses required for program, a GPA of 2.0 or better, and permission of advisor.
- OIS 24107 Internship-Adv Word Processing Spec (F,W,S) 3**  
 The externship consists of 128 hours of directed office work experience consisting of supervised advanced word processing duties in a suitable facility. Prerequisite: completion of all courses required for program, a GPA of 2.0 or better, and permission of advisor.
- OIS 24108 Internship-Medical Clerk (F,W,S) 3**  
 The externship consists of 128 hours of directed office work experience consisting of supervised medical office assistant duties in a suitable medical facility. Prerequisite: completion of all courses required for program, a GPA of 2.0 or better, and permission of advisor.
- OIS 24109 Internship-Medical Billing/Coding (F,W,S) 4**  
 The externship consists of 144 hours of directed office work experience consisting of supervised billing and coding duties in a suitable medical facility. Prerequisite: completion of all courses required for program, a GPA of 2.0 or better, and permission of advisor.



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## **PHILOSOPHY (PHL)**

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**PHL 20100 Intro to Philosophy**

**(F)**

**3 (3-0)**

An introduction to not only the study of philosophy, but also its active and systematic practice. While the course explores such topics as the origin and development of philosophy, the ideas of major philosophers, and significant philosophical issues and problems, students are encouraged, above all, to practice the methods of philosophy as a life skill. Prerequisite or corequisite: ENG-10303 or permission of instructor. (Humanities Credit)

**PHL 21000 Introduction to Ethics**

**(W)**

**3 (3-0)**

An introduction to the study of moral philosophy. Through reading, writing, and discussion, students will explore moral values and the major ethical theories, practice effective moral reasoning, and apply ethical thinking to issues and problems in various fields and their own lives. Prerequisite or corequisite: ENG-10303 or permission of instructor. (Humanities Credit)

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## PHYSICS (PHY)

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<b>PHY 10501</b>	<b>Physical Science</b>	<b>(W)</b>	<b>3 (3-0)</b>
This is a lecture and virtual laboratory classroom course in physical science. The course investigates fundamental matter and energy concepts in the physical universe through the use of selected materials from the areas of astronomy, chemistry, and physics. Attention is given to the methods of scientific inquiry and applications in technology. This course may be elected to meet the science requirement by those not majoring in science. Corequisite: MTH-12000 and PHY-10502. (Science Credit)			
<b>PHY 10502</b>	<b>Physical Science Lab</b>	<b>(W)</b>	<b>1 (0-2)</b>
This is a laboratory course to accompany PHY-10501. Corequisite: PHY-10501. (Science Credit)			
<b>PHY 20101</b>	<b>Physics I with Trigonometry</b>	<b>(W)</b>	<b>4 (4-0)</b>
This is an algebra-trigonometry-based lecture course in introductory physics. Topics will include general properties of energy and matter with emphasis on mechanics, heat and thermodynamics, and sound. Prerequisite: MTH-12000 or permission of instructor. Corequisite: MTH-14000 and PHY-20102. (Science Credit)			
<b>PHY 20102</b>	<b>Physics I with Trigonometry Lab</b>	<b>(W)</b>	<b>1 (0-3)</b>
This is a laboratory course to accompany PHY-20101. Corequisite: PHY-20101.			
<b>PHY 20201</b>	<b>Physics II with Trigonometry</b>	<b>(F)</b>	<b>4 (4-0)</b>
This is a continuation of General Physics I. Topics will include principles of electricity and magnetism, optics, and concepts of modern physics such as relativity and nuclear physics. Prerequisite: PHY-20100 or permission of instructor. Corequisite: PHY-20202. (Science Credit)			
<b>PHY 20202</b>	<b>Physics II with Trigonometry Lab</b>	<b>(F)</b>	<b>1 (0-3)</b>
This is a laboratory course to accompany PHY-20201. Corequisite: PHY-20201. (Science Credit)			
<b>PHY 22101</b>	<b>Physics I with Calculus</b>	<b>(W)</b>	<b>4 (4-0)</b>
This is an introductory lecture course that will provide a calculus-based background of basic principles and theories with practical applications; topics will include general properties of matter with emphasis on mechanics and waves; heat and thermodynamics, and sound. Prerequisite: MTH-22002. Corequisite: MTH-22102 and PHY-22102. (Science Credit)			
<b>PHY 22102</b>	<b>Physics I with Calculus Lab</b>	<b>(W)</b>	<b>1 (0-3)</b>
This is a laboratory course to accompany PHY-22101. It will provide the student with a background of basic laboratory skills and experimental experience in approaching physical principles and theories with practical applications; topics will include electricity and magnetism, optics and light, modern physics, and nuclear physics. Emphasis will be placed on proper laboratory procedures and utilization of the Scientific Method. Corequisite: PHY-22101. (Science Credit)			
<b>PHY 22201</b>	<b>Physics II with Calculus</b>	<b>(F)</b>	<b>4 (4-0)</b>
This is a continuation of PHY-22101 that will provide a calculus-based background of basic principles and theories with practical applications; topics will include electricity and magnetism, optics and light, modern physics, and nuclear physics. Prerequisite: PHY-22101. Corequisite: PHY-22202. (Science Credit)			
<b>PHY 22202</b>	<b>Physics II with Calculus Lab</b>	<b>(F)</b>	<b>1 (0-3)</b>
This is an laboratory course that should be taken in tandem with the PHY-22201 physics lecture course. It will provide the student with a background of basic laboratory skills and experimental experience in approaching physical principles and theories with practical applications; topics will include electricity and magnetism, optics and light, modern physics, and nuclear physics. Emphasis will be placed on proper laboratory procedures and utilization of the Scientific Method. Prerequisite: PHY-22101 and PHY-22102. Corequisite: PHY-22201. (Science Credit)			

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## PLUMBING (PLB)

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<b>PLB 10301</b>	<b>Intro to the Plumbing Profession</b>	<b>(F,W,S)</b>	<b>0.2</b>
<p>Introduces trainees to the many career options available in today's plumbing profession. Provides a history of plumbing and also discusses the current technology, industries, and associations that make up the modern plumbing profession. Also reviews human relations and safety skills.</p>			
<b>PLB 10302</b>	<b>Plumbing Safety</b>	<b>(F,W,S)</b>	<b>0.8</b>
<p>Discusses the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. Reviews the types and proper use of personal protective equipment (PPE). Instructs trainees in the use of critical safety information conveyed in hazard communication (HazCom), safety signs, signals, lockout/tagout, and emergency response. Covers confined-space safety, and reviews safety issues related to hand and power tools.</p>			
<b>PLB 10303</b>	<b>Plumbing Tools</b>	<b>(F,W,S)</b>	<b>0.3</b>
<p>Instructs trainees in the care and use of the different types of hand and power tools they will use on the job. Gives trainees the information they need to select the appropriate tools for different tasks, and reviews tool maintenance and safety issues.</p>			
<b>PLB 10304</b>	<b>Intro to Plumbing Math</b>	<b>(F,W,S)</b>	<b>0.3</b>
<p>Reviews basic math concepts, such as whole numbers, fractions, decimals, and squares, and demonstrates how they apply to on-the-job situations. Teaches trainees how to measure pipe using fitting tables and framing squares and how to calculate 45-degree offsets.</p>			
<b>PLB 10305</b>	<b>Intro to Plumbing Drawings</b>	<b>(F,W,S)</b>	<b>0.5</b>
<p>Introduces trainees to the different types of plumbing drawings they will encounter on the job and discusses how to interpret and apply them when laying out and installing plumbing systems. Discusses the symbols used in plumbing and mechanical drawings and reviews isometric, oblique, orthographic, as well as schematic drawings. Requires trainees to render plumbing drawings and to recognize how code requirements apply to plumbing drawings.</p>			
<b>PLB 10306</b>	<b>Plastic Pipe and Fittings</b>	<b>(F,W,S)</b>	<b>0.4</b>
<p>Introduces trainees to the different types of plastic pipe and fittings used in plumbing applications, including ABS, PVC, CPVC, PE, PEX, and PB. Describes how to measure, cut, join, and support plastic pipe according to manufacturer's instructions and applicable codes. Also discusses pressure testing of plastic pipe once installed.</p>			
<b>PLB 10307</b>	<b>Copper Pipe and Fittings</b>	<b>(F,W,S)</b>	<b>0.4</b>
<p>Discusses sizing, labeling, and applications of copper pipe and fittings and reviews the types of valves that can be used on copper pipe systems. Explains proper methods for cutting, joining, and installing copper pipe. Also addresses insulation, pressure testing, seismic codes, and handling and storage requirements.</p>			
<b>PLB 10308</b>	<b>Cast Iron Pipe and Fittings</b>	<b>(F,W,S)</b>	<b>0.5</b>
<p>Introduces trainees to hub-and-spigot and no-hub cast iron pipe and fittings and their applications in DWV systems. Reviews material properties, storage and handling requirements, and fittings and valves. Covers joining methods, installation, and testing.</p>			
<b>PLB 10309</b>	<b>Carbon Steel Pipe and Fittings</b>	<b>(F,W,S)</b>	<b>0.4</b>
<p>Discusses threading, labeling, and sizing of carbon steel pipe and reviews the differences between domestic and imported pipe. Also covers the proper techniques for measuring, cutting, threading, joining, and hanging carbon steel pipe.</p>			
<b>PLB 10310</b>	<b>Corrugated Stainless Steel Tubing</b>	<b>(F,W,S)</b>	<b>0.1</b>
<p>Reviews flexible plastic-coated steel tubing. Discusses piping system components and the various connection and installation options. Also reviews applicable safety and code requirements.</p>			
<b>PLB 10311</b>	<b>Fixtures and Faucets</b>	<b>(F,W,S)</b>	<b>0.2</b>
<p>Discusses the proper applications of code-approved fixtures and faucets in plumbing installations. Reviews the different types of fixtures and faucets and the materials used in them. Also covers storage, handling, and code requirements.</p>			

<b>PLB 10312</b>	<b>Intro to Drain/Waste/Vent (DWV) Sys</b>	<b>(F,W,S)</b>	<b>0.4</b>
Explains how DWV systems remove waste safely and effectively. Discusses how system components, such as pipe, drains, traps, and vents, work. Reviews drain and vent sizing, grade, and waste treatment. Also discusses how building sewers and sewer drains connect the DWV system to the public sewer system.			
<b>PLB 10313</b>	<b>Intro to Water Distribution Systems</b>	<b>(F,W,S)</b>	<b>0.4</b>
Identifies the major components of water distribution systems and describes their functions. Reviews water sources and treatment methods and covers supply and distribution for the different types of systems that trainees will install on the job.			
<b>PLB 10314</b>	<b>Plumbing Math Two</b>	<b>(F,W,S)</b>	<b>0.6</b>
Explains the Pythagorean theorem and reviews methods for finding angles. Discusses the techniques used to calculate simple and rolling offsets, as well as offsets on parallel runs of pipe.			
<b>PLB 10315</b>	<b>Reading Commercial Drawings</b>	<b>(F,W,S)</b>	<b>0.8</b>
Teaches trainees how to interpret and use civil, architectural, structural, mechanical, plumbing, and electrical drawings when installing plumbing systems. Covers how to create and use isometric drawings, material takeoffs, and approved submittal data.			
<b>PLB 10316</b>	<b>Hanger/Support/Struc Pen/Fire Stop</b>	<b>(F,W,S)</b>	<b>0.4</b>
Introduces trainees to methods for attaching and running DWV and water supply piping in relation to structural elements, including pipe hangers and supports, modifications to structural members, and fire stopping.			
<b>PLB 10317</b>	<b>Installing &amp; Testing DWV Piping</b>	<b>(F,W,S)</b>	<b>1</b>
Explains how to locate, install, connect, and test a complete drain, waste, and vent (DWV) system.			
<b>PLB 10318</b>	<b>Installing Roof/Floor/Area Drains</b>	<b>(F,W,S)</b>	<b>0.2</b>
Covers the proper techniques for locating, installing, and connecting roof, floor, and area drains according to code. Also discusses waterproof membranes and flashing, drain components, and proper drain applications.			
<b>PLB 10319</b>	<b>Types of Valves</b>	<b>(F,W,S)</b>	<b>0.2</b>
Reviews the many types of valves, their components, and valve applications. Also covers valve repair and replacement.			
<b>PLB 10320</b>	<b>Install &amp; Test Water Supply Piping</b>	<b>(F,W,S)</b>	<b>0.8</b>
Explores the proper techniques for locating, installing, and testing complete water supply systems, including piping, meters, water heaters, water softeners, and hose bibs. Reviews common code requirements for water supply systems.			
<b>PLB 10321</b>	<b>Installing Fixtures/Valves/Faucets</b>	<b>(F,W,S)</b>	<b>0.8</b>
Covers the installation of basic plumbing fixtures, including bathtubs, shower stalls, lavatories, sinks, water closets, and urinals. Also reviews the installation of associated valves, faucets, and components.			
<b>PLB 10322</b>	<b>Intro to Electricity</b>	<b>(F,W,S)</b>	<b>0.6</b>
Introduces trainees to the principles of electricity, including voltage, current, resistance, and power. Includes important electrical formulas, circuitry, and common plumbing-related electrical applications.			
<b>PLB 10323</b>	<b>Installing Water Heaters</b>	<b>(F,W,S)</b>	<b>0.2</b>
Discusses gas-fired, electric, solar, instantaneous, and indirect water heaters, components, and applications. Reviews proper installation and testing techniques and covers the latest federal guidelines that apply to water heaters.			
<b>PLB 10324</b>	<b>Fuel Gas Systems</b>	<b>(F,W,S)</b>	<b>0.8</b>
Introduces the techniques for safe handling of natural gas, liquefied petroleum gas, and fuel oil. Reviews fuel gas and fuel oil applications, systems installation, and testing.			
<b>PLB 10325</b>	<b>Servicing Fixtures/Valves/Faucets</b>	<b>(F,W,S)</b>	<b>0.2</b>
Covers the troubleshooting and repair of fixtures, valves, and faucets in accordance with code and safety guidelines.			



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## PSYCHOLOGY (PSY)

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**PSY 10100 Intro to Psychology (F,W,S) 3 (3-0)**

This course is a study of human and animal behavior with reference to perception, learning memory, thinking, emotions, intelligence, aptitude, and personality. The need for scientific investigation of behavior is stressed throughout the course. In addition, the behavioral neuroscience, psychodynamic, social/behavioral, cognitive, and humanistic viewpoints are considered for analysis of psychological phenomena. Prerequisite or corequisite: ENG-10303. (Social Science Credit)

**PSY 20200 Abnormal Psychology (F,W,S) 3 (3-0)**

Abnormal psychology provides examination of the main psychological disorders manifested by individuals across the life span. This includes a descriptive and theoretical survey of the major forms of psychopathology in children, adolescents, and adults, and will also explore current trends and research in the fields of mental health and psychopathology. The course will provide an historical overview of mental illness followed by exploration into the eating disorders, schizophrenia, mood disorders, suicide, anxiety disorders, dissociative disorders, sexual and gender identity disorders and the insanity defense. Prerequisite: PSY-10100. (Social Science Credit)

**PSY 24000 Lifespan Developmental Psychology (W) 3 (3-0)**

This is a course designed to introduce the basic principles of developmental psychology from conception to death (life-span). The course, while pursuing a chronological approach (life-stages) and examining basic developmental tasks appropriate to each stage, will explore the factors that influence growth and development. Prerequisite: PSY-10100 or permission of instructor. (Social Science Credit)

**PSY 26001 Human Sexuality (F) 3 (3-0)**

This course will examine the effect of human sexuality and sex roles upon human behavior. Additionally, findings in contemporary sexual research and therapy will be emphasized. Prerequisite: PSY-10100 or SOC-10100. (Social Science Credit)

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## SOCIOLOGY (SOC)

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- SOC 10100 Intro to Sociology (F,W,S) 3 (3-0)**  
This course is an introduction to the nature of society, culture, group relations, social processes, and institutions. Prerequisite or corequisite: ENG-10303. (Social Science Credit)
- SOC 24000 Criminology (W,S) 3 (3-0)**  
This course provides an analysis of crime, criminal behavior, and punishment through a variety of historical and contemporary theoretical perspectives. Prerequisite or corequisite: ENG-10303 or permission of instructor. (Social Science Credit)
- SOC 24500 Social Deviant Behavior (W) 3 (3-0)**  
This course provides a study of social deviant behavior, including social and ethnic bias, sociopath, cult behavior and ethical behaviors within the criminal justice process. Prerequisite: PSY-10100 or SOC-10100. (Social Science Credit)
- SOC 26001 Human Sexuality (F) 3 (3-0)**  
This course will examine the effect of human sexuality and sex roles upon human behavior. Additionally, findings in contemporary sexual research and therapy will be emphasized. Prerequisite: PSY-10100 or SOC-10100. (Social Science Credit)

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## SONOGRAPHY (SON)

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<b>SON 10000</b>	<b>Intro to Sonography Patient Care</b>	<b>(F,W,S)</b>	<b>2 (1-1)</b>
<p>This course consists of theory and guided learning lab practice. Focus is acquisition of basic skills and an understanding of cardiac medical terminology, pharmacology, and monitoring along with the basics of IV therapy, vital signs, patient transfer, O2 maintenance and medical ethics (including HIPPA).</p>			
<b>SON 10500</b>	<b>Cardiac Anatomy &amp; Physiology</b>	<b>(F, W)</b>	<b>3 (3-0)</b>
<p>A complete study and explanation of the heart and its associated structures. This class is vital to an understanding of the anatomy and function of the heart, as well as the basic cardiac physiology as it relates to cardiac anatomy and function.</p>			
<b>SON 11000</b>	<b>Ultrasound Physics</b>	<b>(F,W)</b>	<b>3 (3-0)</b>
<p>This course is designed to teach the fundamentals of Ultrasound Physics and instrumentation. This includes review of different transducer models, the propagation of sound waves, and the Ultrasound's effect on the body.</p>			
<b>SON 11600</b>	<b>Cardiac Principles I</b>	<b>(F,W)</b>	<b>3 (3-0)</b>
<p>This course applies the knowledge of cardiovascular anatomy and physiology to the fundamentals of ultrasound imaging and the knowledge to obtain the standard basic views required for an echocardiographic examination. Prerequisite: program progression. Corequisite: SON11700 - Cardiac Lab I.</p>			
<b>SON 11700</b>	<b>Cardiac Lab I</b>	<b>(F,W)</b>	<b>4 (0-8)</b>
<p>This course is the application of theory to practice related to the fundamentals of ultrasound imaging and the standard basic views required for an echocardiographic examination. Prerequisite: program progression. Corequisite: SON11600 - Cardiac Principles I.</p>			
<b>SON 12500</b>	<b>Echo I</b>	<b>(W,S)</b>	<b>3 (3-0)</b>
<p>This course presents cardiovascular related conditions and diseases. Their etiology and symptoms are discussed and correlated to cardiovascular imaging and techniques required to assist the physician in diagnosis of these conditions. Prerequisite: program progression.</p>			
<b>SON 13100</b>	<b>Cardiac Principles II</b>	<b>(W,S)</b>	<b>3 (3-0)</b>
<p>This course provides further knowledge related to cardiac anatomy and physiology to the principles of cardiac imaging techniques and procedures. Prerequisite: program progression. Corequisite: SON13200 - Cardiac Lab II.</p>			
<b>SON 13200</b>	<b>Cardiac Lab II</b>	<b>(W,S)</b>	<b>4 (0-8)</b>
<p>This course applies theory to practice of Cardiac Principles II and integrates the knowledge of anatomy, physiology and hemodynamics with clinical skills. Prerequisite: program progression. Corequisite: SON13100 - Cardiac Principles II.</p>			
<b>SON 13500</b>	<b>Clinical Practice I</b>	<b>(W,S)</b>	<b>2 (0-6)</b>
<p>This course is an arranged off campus clinical experience at a variety of facilities. Prerequisite: program progression.</p>			
<b>SON 15000</b>	<b>Echo II</b>	<b>(F,S)</b>	<b>3 (3-0)</b>
<p>This course relates further knowledge of cardiac anatomy and physiology and cardiac pathology and abnormalities that may be encountered in a clinical setting.</p>			
<b>SON 15500</b>	<b>Cardiac Principles and Lab III</b>	<b>(F,W)</b>	<b>4 (1-6)</b>
<p>This course focuses on the skills necessary to perform complete cardiac exams and correlate cardiac disease processes and pathology that may be present in order to aid the physician in the appropriate disease diagnosis. Students increase in knowledge and skills as this course integrates advanced cardiovascular imaging techniques to investigate various cardiac disease states.</p>			
<b>SON 15600</b>	<b>Cardiac Principles III</b>	<b>(F,W)</b>	<b>3 (3-0)</b>
<p>This course focuses on correlating cardiac disease processes and pathophysiology to aid the physician in the appropriate disease diagnosis. The students increase in knowledge as this course integrates advanced cardiac imaging techniques to investigate various cardiac disease states. Prerequisite: program progression. Corequisite: SON15700 - Cardiac Lab III.</p>			

**SON 15700 Cardiac Lab III (F,W) 4 (0-8)**

This course applies theory to practice related to pathophysiology of cardiac disease, advanced cardiac imaging techniques and procedures with doppler flow and measurements of patients with advanced cardiac disease.

**SON 16000 Clinical Practice II (F,W) 2 (0-6)**

This course is an arranged off-campus clinical experience at a variety of facilities. Prerequisite: program progression.

**SON 22000 Externship (W) 15.5 (0-15.5)**

Students will be assigned to an off campus, remote site in order to complete 697.5 clock hours of practice with a preceptor. Prerequisite: program progression.

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## **SPEECH (SPE)**

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**SPE 10500 Fund of Speech (F,W) 3 (3-0)**

Fundamentals of Speech addresses the basic principles of speech construction and delivery. During the course, the student will give various kinds of speeches, including impromptu and extemporaneous. (Communication)

**SPE 11400 Intro to Interpersonal/Public Comm (F,W,S) 3 (3-0)**

Introduction to Interpersonal and Public Communication is a course aimed at understanding and applying communication theory. Communication skills will be developed through small group activities, public speaking, and personal assessment assignments. (Communication)

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## SURGICAL TECHNOLOGY (SUR)

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<b>SUR 10000</b>	<b>Fundamentals of Surgical Technology</b>	<b>(F)</b>	<b>3 (3-0)</b>
This course introduces the role of the surgical technician as well as the procedures, skills, and protocol to work in the operating room environment. Prerequisite: acceptance into the surgical technology program. Corequisite: SUR-10100.			
<b>SUR 10100</b>	<b>Surgical Asepsis</b>	<b>(F)</b>	<b>2 (2-0)</b>
This course defines and describes pathogenic microorganism as well as hospital infections causes and prevention. The student will learn methods of controlling these microorganisms through sterilization and disinfection. Corequisite: SUR-10000.			
<b>SUR 10200</b>	<b>The Surgical Patient</b>	<b>(F)</b>	<b>2 (2-0)</b>
This course provides knowledge related to care and safety of the surgical patient pre, post and during their surgical experience. The introduction of the technicians role and responsibilities related to legal and ethical dilemmas faced in the healthcare field are explored. Prerequisite: program progression.			
<b>SUR 10300</b>	<b>Surgical Pharmacology</b>	<b>(F)</b>	<b>2 (2-0)</b>
This course provides knowledge related to different types of anesthesia and their indications as well as their contraindications. The student will learn mathematical calculations as well as the commonly used medications for the surgical patient. Prerequisite: program progression.			
<b>SUR 10400</b>	<b>Basic Operative Procedures</b>	<b>(F)</b>	<b>2 (2-0)</b>
The student will learn the basic types of surgical procedures with an emphasis on maintaining sterile technique. With these procedures the anatomy, physiology and pathophysiology will be reviewed. Prerequisite: program progression. Corequisite: SUR-10000, SUR-10500, and SUR-10600.			
<b>SUR 10500</b>	<b>Surgical Techniques I</b>	<b>(F)</b>	<b>2 (0-4)</b>
This course will apply theory to practice related to the use of procedures, protocols, and skills learned in Fundamentals and the surgical procedures learned in Basic Operating Procedures. An emphasis is placed on maintaining surgical asepsis during these procedures as well as anticipatory guidance. Prerequisite: program progression. Corequisite: SUR-1000 and SUR-10400.			
<b>SUR 10600</b>	<b>Surgical Techniques II</b>	<b>(F)</b>	<b>3 (0-6)</b>
This course applies theory to practice with mock surgical procedures and simulation with principles, protocols and skills learned in Fundamentals of Surgical Technology and Basic Operative Procedures. Prerequisite: program progression, SUR-10500. Corequisite: SUR-10000 and SUR-10400.			
<b>SUR 20000</b>	<b>Advanced Surgical Procedures</b>	<b>(W)</b>	<b>3 (0-6)</b>
This course advances the students knowledge and skills with more complex and advanced surgical procedures focusing on the sequential aspect of the procedure with specialized instrumentation. Anatomy and physiology of these complex cases is reviewed as well as biomedical components in the surgical environment. Prerequisite: program progression. Corequisite: SUR-20100 and SUR-20200.			
<b>SUR 20100</b>	<b>Surgical Techniques III</b>	<b>(W)</b>	<b>5 (0-15)</b>
This course provides for application of theory in the clinical environment of a hospital with the application of skills in basic and advanced surgical procedures. Prerequisite: program progression. Corequisite: SUR-20000.			
<b>SUR 20200</b>	<b>Surgical Techniques IV</b>	<b>(W)</b>	<b>5 (0-15)</b>
This course provides for application of theory in the clinical environment of a hospital with the application of skills in basic and advanced surgical procedures while incorporating the biomedical resources in surgical specialty areas. Prerequisite: program progression. Corequisite: SUR-20000.			
<b>SUR 20300</b>	<b>Surgical Professional Practice</b>	<b>(W)</b>	<b>2 (2-0)</b>
This course provides knowledge related to future advances in surgical technology in specialty surgeries and telesurgery. Preparation for the national certification exam is provided and an emphasis on professional practice responsibilities is reviewed. Prerequisite: program progression.			

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## THEATRE (THE)

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**THE 12000 Intro to Theatre (F) 3 (3-0)**

This course is a survey of the evolution of world theatre forms, from the cave drawings of prehistoric man to the most recent shows on the Broadway stage. Classroom discussions will cover the major producers, playwrights, performers, directors, and designers of each era covered, as well as the body of literature that has come to represent that era. Classroom sessions will be augmented by readings from these periods. (Humanities Credit)

**THE 121-- Theatre Workshop I (F,W) 1-3**

The workshop provides practical experience in mounting a theatrical production. The student will gain familiarity with one or more of the following areas: acting, directing, costuming, scenery construction, properties, lighting and sound, and stage management. A weekly time commitment will be a requirement during the semester. The student will be required to work 30 hours or more for one credit hour, 60 hours or more for two credit hours, and 90 hours or more for three credit hours. (Humanities Credit)

**THE 12200 Stagecraft I (W) 3 (3-0)**

This course studies and applies the basic techniques of set construction, theatrical lighting, sound technology, stage rigging, and backstage organization. This "basics" course will introduce the student to the various technical elements that make a theatre run. The class will cover various theatre disciplines outlined above and provide actual hands-on experience with theatre lighting and sound equipment, maneuvering theatre catwalks, and building basic theatrical scenery. This course is required for admission to upper-level design and technology courses. (Humanities Credit)

**THE 12300 Acting I (F) 3 (3-0)**

This class is an introduction to the art of acting. The student walks the path of the actor from developing an acting technique to the performance of short scenes. The actor learns to get beyond the limits of self and explore the freedom of creating a character. Along the way, time will be spent exploring the creative process and developing an ensemble approach to acting. Acting I can work in conjunction with the semester's theatrical production. (Humanities Credit)

**THE 21000 Theatre Makeup (W) 3 (3-0)**

The student will become familiar with the art and profession of stage makeup. This course will involve hands-on experience in the principles of the art and technique of designing and applying theatrical makeup. Makeup textbooks will be provided as reference material. The course will cover character analysis, facial anatomy, makeup supplies, and professional makeup application. (Humanities Credit)

**THE 221-- Theatre Workshop II (F,W) 1-3**

This course is a continuation of Theatre Workshop I. Students concentrate their efforts in different areas than they did in Workshop I. A weekly time commitment will be a requirement during the semester. The student will be required to work 45 hours or more for one credit hour, 90 hours or more for two credit hours, and 135 hours or more for three credit hours. Prerequisite: THE-12100 or permission of instructor. (Humanities Credit)

**THE 27000 Audition/Resume Workshop (W) 3 (3-0)**

This course prepares the student to audition and/or interview for professional employment in theatre or for admission into a B.F.A. training program. Students will develop theatrical résumés, portfolios, and/or audition books specific to the field they wish to pursue. Students will also learn how to modify and update their audition/interview materials as changes in their circumstances dictate. Prerequisites: sophomore status, successful completion of THE-12000 or permission of instructor. (Humanities Credit)

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## WELDING (WLD)

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<b>WLD 10120</b>	<b>Welding Safety</b>	<b>(F,W,S)</b>	<b>0.13 (0-3)</b>
<p>Safe working conditions and job performances happen as a result of knowledgeable workers with positive attitudes. A safe worker knows the safety regulations are important to his or her employment. He/she uses the safeguards, personal protection devices, and other equipment required for safe working conditions for all employees. Students will demonstrate and practice the safety guidelines of the welding lab.</p>			
<b>WLD 10121</b>	<b>AWS Joints/Positions/Welds/Symbols</b>	<b>(F,W,S)</b>	<b>0.13 (0-3)</b>
<p>In all welding processes there are several types of joints, welds and positions. Metal preparation varies as well as the technique of making a weld. The welder should know the differences and be able to identify these variables by using the American Welding Society numbering system. Given the necessary materials and equipment the student will demonstrate the ability to read and measure with basic types of rules.</p>			
<b>WLD 10122</b>	<b>OAW Terms &amp; Equipment Setup</b>	<b>(F,W,S)</b>	<b>0.17 (0-4)</b>
<p>In this module the student will learn oxyacetylene welding, safety terms and definitions acceptable to American Welding Society standards and how to effectively set-up and shut-down an oxyacetylene welding station properly. In order to safely begin oxyacetylene welding, it is first necessary to know how to set the equipment up in a safe and proper manner. Setting up and shutting down of an oxyacetylene welding station improperly could cause serious damage or injury to yourself, the people working near you, and the equipment.</p>			
<b>WLD 10123</b>	<b>OAW Stringer Beads &amp; Joints 1G-1F</b>	<b>(F,W,S)</b>	<b>0.36 (0-9)</b>
<p>The welder does more work in the flat position than in any other position. Welding the various joints in the flat position is the basis for all other welding procedures. In this module, the student will demonstrate how to run stringer beads with and without a filler rod, in the flat position.</p>			
<b>WLD 10124</b>	<b>BW Stringer Beads &amp; Joints</b>	<b>(F,W,S)</b>	<b>0.29 (0-7)</b>
<p>Brazing and braze welding are two non-fusion metal joining processes that require much less heat than any of the fusion welding processes. In brazing, you coat the surface of the base metal with a brazing alloy. This process is called adhesion. In this module, the student will demonstrate how to braze the basic joints in the flat position.</p>			
<b>WLD 10125</b>	<b>Cutting OA/Plasma Cutting/Carbn Arc</b>	<b>(F,W,S)</b>	<b>0.45 (0-11)</b>
<p>Cutting metal is a very common occurrence among welders. There are many ways to accomplish this. The oxyacetylene torch and plasma are two ways to do this. Plasma arc cutting can cut different metals, such as stainless, aluminum, and other hard to cut alloy steels. In this module, the student will demonstrate how to cut both ferrous and non-ferrous metals by manual and automatic means by using Plasma and Oxyacetylene. Air carbon arc cutting is a method of removing unsatisfactory welds in a short period of time. In this module the student will identify terms and definitions of the process, as well as utilize the process to remove an unacceptable weld from metal.</p>			
<b>WLD 10126</b>	<b>Identifying Good Welds per AWS</b>	<b>(F,W,S)</b>	<b>0.13 (0-3)</b>
<p>To produce good welds you must not only know how to manipulate the electrode, but you must know certain weld characteristics, types of electrode characteristics, and types of machines and their settings. Knowledge of what constitutes an acceptable weld and what constitutes an unacceptable weld is also important. In this module the student will explain the difference between good weld characteristics and bad.</p>			
<b>WLD 10127</b>	<b>SMAW Terms/Identify Electrodes</b>	<b>(F,W,S)</b>	<b>0.17 (0-4)</b>
<p>With any trade, there is a language which relates only to that trade and has special meaning for persons involved with that occupation. This module contains the most common terms important to arc welding. Also S.M.A.W. electrodes have a core of metal to supply filler metal to the weld. They also have a covering of flux that is burned to supply a gas shield around the arc and slag over the molten puddle. In this module the student will explain some of the American Welding Society (A.W.S.) terms and what the electrode numbering system means for identifying the different covered electrodes.</p>			
<b>WLD 10128</b>	<b>SMAW Set-up &amp; Weld Stringer Beads</b>	<b>(F,W,S)</b>	<b>0.42 (0-10)</b>
<p>Learning to stick weld involves mastery of a specific series of operations. Skill in performing these operations requires a lot of practice. Once this skill has been acquired, the operations can be applied on any welding job. In this module, the student will demonstrate how to strike and maintain an arc to run stringer beads on a plate of metal.</p>			

<b>WLD 10129 SMAW Welding Joints/Flat Pos/1G-1F</b>	<b>(F,W,S)</b>	<b>0.33 (0-8)</b>
In this module the student will demonstrate how to effectively weld joints in the flat position (1G & 1F) using the S.M.A.W. process on a base metal, according to American Welding Society Standards.		
<b>WLD 10130 GMAW Set-up &amp; Weld Stringer Beads</b>	<b>(F,W,S)</b>	<b>0.42 (0-10)</b>
The gas metal arc welding process (abbreviated G.M.A.W.) uses a continuously fed wire for the electrode and filler metal. G.M.A.W. is a semiautomatic welding operation that is especially useful where making long, continuous welds and fast welding speeds are required. In this module the student will explain the general principles of G.M.A.W., some of the advantages and disadvantages of G.M.A.W., and how the wire electrode is applied or transferred to the parent metal being welded. Also in this module the student will demonstrate how to actually establish the arc and make weld beads using the G.M.A.W. equipment correctly.		
<b>WLD 10131 GMAW Welding Joints/Flat Pos/1G-1F</b>	<b>(F,W,S)</b>	<b>0.29 (0-7)</b>
In this module the student will demonstrate how to effectively weld joints in the flat position (1G & 1F) using the G.M.A.W. process on a base metal, according to American Welding Society Standards.		
<b>WLD 10132 FCAW Set-up &amp; Weld Stringer Beads</b>	<b>(F,W,S)</b>	<b>0.42 (0-10)</b>
The flux cored arc welding process (abbreviated F.C.A.W.) uses a continuously fed wire for the electrode that has a flux coating and filler metal. F.C.A.W. is a semiautomatic welding operation that is especially useful where making long, continuous welds and fast welding speeds are required and where more weld strength and/or penetration is required. In this module the student will explain the general principles of F.C.A.W., some of the advantages and disadvantages of F.C.A.W., and how the wire electrode is applied or transferred to the parent metal being welded. Also in this module the student will demonstrate how to actually establish the arc and make weld beads using the F.C.A.W. equipment correctly.		
<b>WLD 10133 FCAW Welding Joints/Flat Pos/1G-1F</b>	<b>(F,W,S)</b>	<b>0.29 (0-7)</b>
In this module the student will demonstrate how to effectively weld joints in the flat position (1G & 1F) using the F.C.A.W. process on a base metal, according to American Welding Society Standards.		
<b>WLD 10240 GMAW Welding Joints/Hor Pos/2G-2F</b>	<b>(F,W,S)</b>	<b>0.17 (0-4)</b>
In this module the student will demonstrate how to effectively weld joints in the horizontal position (2G & 2F) using the G.M.A.W. process on a base metal, according to American Welding Society Standards.		
<b>WLD 10241 FCAW Welding Joints/Hor Pos/2G-2F</b>	<b>(F,W,S)</b>	<b>0.17 (0-4)</b>
In this module the student will demonstrate how to effectively weld joints in the horizontal position (2G & 2F) using the F.C.A.W. process on a base metal, according to American Welding Society Standards.		
<b>WLD 10242 GMAW Welding Joints/Ver Pos/3G-3F</b>	<b>(F,W,S)</b>	<b>0.17 (0-4)</b>
In this module the student will demonstrate how to effectively weld joints in the vertical position (3G & 3F) using the G.M.A.W. process on a base metal, according to American Welding Society Standards.		
<b>WLD 10243 FCAW Welding Joints/Ver Pos/3G-3F</b>	<b>(F,W,S)</b>	<b>0.17 (0-4)</b>
In this module the student will demonstrate how to effectively weld joints in the vertical position (3G & 3F) using the F.C.A.W. process on a base metal, according to American Welding Society Standards.		
<b>WLD 10244 GMAW Welding Joints/Ovhd Pos/4G-4F</b>	<b>(F,W,S)</b>	<b>0.21 (0-5)</b>
In this module the student will demonstrate how to effectively weld joints in the overhead position (4G & 4F) using the G.M.A.W. process on a base metal, according to American Welding Society Standards.		
<b>WLD 10245 FCAW Welding Joints/Ovhd Pos/4G-4F</b>	<b>(F,W,S)</b>	<b>0.21 (0-5)</b>
In this module the student will demonstrate how to effectively weld joints in the overhead position (4G & 4F) using the F.C.A.W. process on a base metal, according to American Welding Society Standards.		
<b>WLD 10246 GMAW Pulse Arc/Flat Pos/1G-1F</b>	<b>(F,W,S)</b>	<b>0.17 (0-4)</b>
In this module the student will demonstrate how to effectively weld joints in the flat position (1G & 1F) using the G.M.A.W. Pulse Arc process on a base metal, according to American Welding Society Standards.		

<b>WLD 10247</b>	<b>GMAW Metal Core Arc Wld/Flat/1G-1F</b>	<b>(F,W,S)</b>	<b>0.17 (0-4)</b>
In this module the student will demonstrate how to effectively weld joints in the flat position (1G & 1F) using the G.M.A.W. Pulse Arc process on a base metal, according to American Welding Society Standards.			
<b>WLD 10248</b>	<b>GMAW Welding Joints Aluminum/All Ps</b>	<b>(F,W,S)</b>	<b>0.33 (0-8)</b>
In this module the student will demonstrate how to effectively weld joints in all positions (flat, horizontal, vertical & overhead) using the G.M.A.W. process with a Aluminum wire, on a base metal, according to American Welding Society Standards.			
<b>WLD 10249</b>	<b>Welding Blueprint Reading</b>	<b>(F,W,S)</b>	<b>0.17 (0-4)</b>
Practically all welding blueprints are incorporated with weld symbols and notations to give the welder needed information to complete a job. A welder must know how to use these symbols and notations to assure that welded assemblies meet design requirements. In this module the student will be able to identify different American Welding Society welding symbols.			
<b>WLD 10250</b>	<b>Fab. Project Using GMAW or FCAW</b>	<b>(F,W,S)</b>	<b>0.5 (0-12)</b>
In this module the student will fabricate a project using the G.M.A.W. or F.C.A.W. process, from a set of prints provided from the instructor. The prints will include a cut list, dimensions, and the appropriate American Welding Society welding symbols needed to complete the project. The instructor must approve all projects before they are started.			
<b>WLD 10251</b>	<b>SMAW Multi-Pass Stringer/Flat/1F</b>	<b>(F,W,S)</b>	<b>0.42 (0-10)</b>
In this module the student will demonstrate how to effectively run stringer beads in the flat position (1G & 1F) using the S.M.A.W. process on a base metal, according to American Welding Society Standards.			
<b>WLD 10252</b>	<b>SMAW Multi-Pass Weave/Flat/1F</b>	<b>(F,W,S)</b>	<b>0.42 (0-10)</b>
In this module the student will demonstrate how to effectively run stringer beads in the flat position (1G & 1F) using the S.M.A.W. process and weave technique, on a base metal, according to American Welding Society Standards.			
<b>WLD 10253</b>	<b>SMAW Welding Joints/Hor Pos/2G-2F</b>	<b>(F,W,S)</b>	<b>0.36 (0-9)</b>
In this module the student will demonstrate how to effectively run stringer beads in the horizontal position (2G & 2F) using the S.M.A.W. process on a base metal, according to American Welding Society Standards.			
<b>WLD 10254</b>	<b>SMAW Welding Joints/Ver Pos/3G-3F</b>	<b>(F,W,S)</b>	<b>0.36 (0-9)</b>
In this module the student will demonstrate how to effectively run stringer beads in the vertical position (3G & 3F) using the S.M.A.W. process on a base metal, according to American Welding Society Standards.			
<b>WLD 10351</b>	<b>Braze Welding V-Groove Butt Joint</b>	<b>(F,W,S)</b>	<b>0.21</b>
This course will teach the learner the proper way to braze a V-groove butt joint using oxyacetylene.			
<b>WLD 10370</b>	<b>SMAW Welding Joints/Ovhd Pos/4G-4F</b>	<b>(F,W,S)</b>	<b>0.5 (0-12)</b>
In this module the student will demonstrate how to effectively run stringer beads in the overhead position (4G & 4F) using the S.M.A.W. process on a base metal, according to American Welding Society Standards.			
<b>WLD 10371</b>	<b>Fabricate Project Using SMAW</b>	<b>(F,W,S)</b>	<b>0.5 (0-12)</b>
In this module the student will fabricate a project using the S.M.A.W. process, from a set of prints provided from the instructor. The prints will include a cut list, dimensions, and the appropriate American Welding Society welding symbols needed to complete the project. The instructor must approve all projects before they are started.			
<b>WLD 10372</b>	<b>Welding Metallurgy</b>	<b>(F,W,S)</b>	<b>0.9 (0-22)</b>
In this module the student will be able to explain the effects welding has on different metals and what takes place on a molecular level to the different metals when welding is performed on these metals. The student will perform micro-etch inspections to weld joints to identify and measure, penetration, weld size and the heat affected zone, on a variety of different welds performed in several different welding positions and processes.			

<b>WLD 10373</b>	<b>GTAW Setup &amp; Weld Stringer Beads</b>	<b>(F,W,S)</b>	<b>0.42 (0-10)</b>
The gas tungsten arc welding process (abbreviated G.T.A.W.) uses a tungsten electrode and shielding gas for welding metal. In the G.T.A.W. process the weld is produced by the arc maintained between the end of a metal (tungsten) electrode and the part to be welded. In this module the student will demonstrate how to actually establish the arc and make weld beads using the G.T.A.W. equipment correctly.			
<b>WLD 10374</b>	<b>GTAW Weld Joints/Steel/Flat/1G-1F</b>	<b>(F,W,S)</b>	<b>0.42 (0-10)</b>
In this module the student will demonstrate how to effectively weld joints in the flat position (1G & 1F) using the G.T.A.W. process on steel, according to American Welding Society Standards.			
<b>WLD 10375</b>	<b>GTAW Weld Jts/StainSteel/Flat/1G-1F</b>	<b>(F,W,S)</b>	<b>0.42 (0-10)</b>
In this module the student will demonstrate how to effectively weld joints in the flat position (1G & 1F) using the G.T.A.W. process on stainless steel, according to American Welding Society Standards.			
<b>WLD 10376</b>	<b>GTAW Weld Joints/Alum/Flat/1G-1F</b>	<b>(F,W,S)</b>	<b>0.42 (0-10)</b>
In this module the student will demonstrate how to effectively weld joints in the flat position (1G & 1F) using the G.T.A.W. process on aluminum, according to American Welding Society Standards.			
<b>WLD 10377</b>	<b>GTAW Weld Joints/Steel/Hor/2G-2F</b>	<b>(F,W,S)</b>	<b>0.42 (0-10)</b>
In this module the student will demonstrate how to effectively weld joints in the horizontal position (2G & 2F) using the G.T.A.W. process on steel, according to American Welding Society Standards.			
<b>WLD 20450</b>	<b>GTAW Weld Jts/Stain Steel/Hor/2G-2F</b>	<b>(F,W,S)</b>	<b>0.5 (0-12)</b>
In this module the student will demonstrate how to effectively weld joints in the horizontal position (2G & 2F) using the G.T.A.W. process on stainless steel, according to American Welding Society Standards.			
<b>WLD 20451</b>	<b>GTAW Weld Joints/Alum/Hor/2G-2F</b>	<b>(F,W,S)</b>	<b>0.5 (0-12)</b>
In this module the student will demonstrate how to effectively weld joints in the horizontal position (2G & 2F) using the G.T.A.W. process on aluminum, according to American Welding Society Standards.			
<b>WLD 20452</b>	<b>GTAW Weld Joints/Steel/Ver/3G-3F</b>	<b>(F,W,S)</b>	<b>0.5 (0-12)</b>
In this module the student will demonstrate how to effectively weld joints in the vertical position (3G & 3F) using the G.T.A.W. process on steel, according to American Welding Society Standards.			
<b>WLD 20453</b>	<b>GTAW Weld Jts/Stain Steel/Ver/3G-3F</b>	<b>(F,W,S)</b>	<b>0.5 (0-12)</b>
In this module the student will demonstrate how to effectively weld joints in the vertical position (3G & 3F) using the G.T.A.W. process on stainless steel, according to American Welding Society Standards.			
<b>WLD 20454</b>	<b>GTAW Weld Joints/Alum/Ver/3G-3F</b>	<b>(F,W,S)</b>	<b>0.5 (0-12)</b>
In this module the student will demonstrate how to effectively weld joints in the vertical position (3G & 3F) using the G.T.A.W. process on aluminum, according to American Welding Society Standards.			
<b>WLD 20455</b>	<b>GTAW Weld Joints/Steel/Ovhd/4G-4F</b>	<b>(F,W,S)</b>	<b>0.5 (0-12)</b>
In this module the student will demonstrate how to effectively weld joints in the overhead position (4G & 4F) using the G.T.A.W. process on steel, according to American Welding Society Standards.			
<b>WLD 20456</b>	<b>GTAW Weld Jts/StainSteel/Ovhd/4G-4F</b>	<b>(F,W,S)</b>	<b>0.5 (0-12)</b>
In this module the student will demonstrate how to effectively weld joints in the overhead position (4G & 4F) using the G.T.A.W. process on stainless steel, according to American Welding Society Standards.			
<b>WLD 20457</b>	<b>GTAW Weld Joints/Alum/Ovhd/4G-4F</b>	<b>(F,W,S)</b>	<b>0.5 (0-12)</b>
In this module the student will demonstrate how to effectively weld joints in the overhead position (4G & 4F) using the G.M.A.W. process on aluminum, according to American Welding Society Standards.			

<b>WLD 20510</b>	<b>Introduction to Pipe Welding</b>	<b>(F,W,S)</b>	<b>0.21 (0-5)</b>
Pipe welding has much in common with welding plate, sheet metal, or castings. They are made from the same metals, and the metals have the same welding characteristics and welding processes. In this module the student will describe some of the codes governing pipe welding, and the tests you must take to qualify those welds. The student will also explain pipe joint design criteria, edge preparation, welding methods, and accessories needed for pipe welding.			
<b>WLD 20511</b>	<b>Pipe Welding 2G Fixed Position</b>	<b>(F,W,S)</b>	<b>0.67 (0-16)</b>
In this module the student will demonstrate how to effectively weld joints in the 2G Fixed position using multiple processes, on different pipe metals, according to American Welding Society Standards.			
<b>WLD 20512</b>	<b>Pipe Welding 5G Fixed Pos/Vert Up</b>	<b>(F,W,S)</b>	<b>1.04 (0-25)</b>
In this module the student will demonstrate how to effectively weld joints in the 5G Fixed position, vertical up, using multiple processes, on different pipe metals, according to American Welding Society Standards.			
<b>WLD 20513</b>	<b>Pipe Welding 5G Fixed Pos/Vert Down</b>	<b>(F,W,S)</b>	<b>1.04 (0-25)</b>
In this module the student will demonstrate how to effectively weld joints in the 5G Fixed position, vertical down, using multiple processes, on different pipe metals, according to American Welding Society Standards.			
<b>WLD 20514</b>	<b>Pipe Welding 6G Fixed Position</b>	<b>(F,W,S)</b>	<b>1.04 (0-25)</b>
In this module the student will demonstrate how to effectively weld joints in the 6G Fixed position, using multiple processes, on different pipe metals, according to American Welding Society Standards.			
<b>WLD 20606</b>	<b>6 Welder Qualifications &amp; Projects</b>	<b>(F,W,S)</b>	<b>4 (0-96)</b>
In this module the student will demonstrate the ability to pass up to 6 welding qualifications according to the American Welding Society Standards, including all necessary documentation such as WPS, PQR & WPQR's and complete designated projects with the Instructor's approval.			
<b>WLD 207--</b>	<b>Directed Study-Welding Techniques</b>	<b>(V)</b>	<b>1-4</b>
This course is designed to meet special occupational needs for the individual student. Prerequisite: recommendation of an advisor. All proposals designed for purposes of directed study must be approved by the Welding instructor prior to starting.			

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## WORLD LANGUAGES (LAN)

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<b>FRE 11000</b>	<b>French I</b>	<b>(F,W)</b>	<b>4 (4-0)</b>
This course concentrates on functional communication. Communication is a primary goal with grammar to support this goal. This course will also introduce the student to the cultures associated with the language. (Humanities Credit)			
<b>FRE 12000</b>	<b>French II</b>	<b>(W)</b>	<b>4 (4-0)</b>
A continuation of Language I with further development of oral and written skills. The goal is to increase confidence and comfort with the cultures and language. Prerequisite: FRE-11000 or permission of instructor - NOTE: Students who have taken French in high school are encouraged to contact the instructor for permission to take this level II course. (Humanities Credit)			
<b>SGN 10200</b>	<b>Fingerspelling</b>	<b>(W)</b>	<b>2</b>
Students will learn the use of hand shapes to represent letters of the alphabet used in American Sign Language. The course will focus on reading "words" and not letters. (Humanities Credit)			
<b>SGN 11000</b>	<b>American Sign Language I</b>	<b>(F)</b>	<b>4</b>
This course covers the beginning level of the native language of the deaf. Students will develop receptive and expressive skills in fingerspelling, vocabulary, and short sentences. Objectives are met through use of drills, videos, and occasional guests who are deaf. NOTE: There is no prerequisite, but prior knowledge of ASL is helpful. (Humanities Credit)			
<b>SGN 12000</b>	<b>American Sign Language II</b>	<b>(W)</b>	<b>4</b>
This course is a continuation of American Sign Language I. Prerequisite: SGN-10000 or permission of instructor. (Humanities Credit)			
<b>SGN 13000</b>	<b>American Sign Language III</b>	<b>(V)</b>	<b>4</b>
This course is a continuation of American Sign Language II. Prerequisite: SGN-10100. (Humanities Credit)			
<b>SPN 11000</b>	<b>Spanish I</b>	<b>(F)</b>	<b>4 (4-0)</b>
This course concentrates on functional communication. Communication is a primary goal with grammar to support this goal. This course will also introduce the student to the cultures associated with the language. (Humanities Credit)			
<b>SPN 12000</b>	<b>Spanish II</b>	<b>(W)</b>	<b>4 (4-0)</b>
A continuation of Language I with further development of oral and written skills. The goal is to increase confidence and comfort with the cultures and language. Prerequisite: SPN-11000 or permission of instructor - NOTE: Students who have taken Spanish in high school are encouraged to contact the instructor for permission to take this level II course. (Humanities Credit)			