

**Central Ohio Technical College  
Course Description Listing  
1999-2000 Academic Year**

**ENGINEERING TECHNOLOGIES: 3000**

**3001 Principles of Engineering Technologies**

2 credit hours, 3 contact hours (1 hours lecture and 2 hours lab). Prerequisite: None.

This course introduces different fields of engineering and their area(s) of specialization including the varying roles of engineering technicians in industry. Topics of study include the concepts and terminology used in the field of engineering, basic concepts of mathematics, use of scientific calculators, problem solving techniques, and units and dimensional analysis used in measuring force, power and energy.

**3012 Computers for Engineering Technicians**

3 credit hours, 5 contact hours (2 hours lecture and 3 hours lab). Prerequisite: None.

This course introduces the student to PC hardware and system software including recent versions of the DOS and the Windows operating systems. Laboratory exercises emphasize connecting the hardware subsystems, installing and using system software, customizing systems, and loading application software. The student is introduced to the use of printers, networks, and the Internet.

**3013 Drafting I**

3 credit hours, 5 contact hours (2 hours lecture and 3 hours lab). Prerequisite: None.

This is the first course of a series introducing the principles, techniques, and terminology of drafting. Emphasis is on the development of sketching techniques, multi-view drawings, dimensioning, sections, and blueprint reading.

**3017 Circuits I**

5 credit hours, 7 contact hours (3 hours lecture and 4 hours lab). Prerequisite: 1210 or score of at least 76 on COMPASS Elementary Algebra test.

This introductory course presents the terminology and concepts necessary for understanding electrical units and laws and circuit analysis. Topics of study include direct current sources, series and parallel circuits, Ohm's law, Kirchoff's Laws, resistance, power, capacitance and inductance. Laboratory sessions include experiments verifying the lecture material through the proper use of voltmeters, ammeters, ohmmeters, and dc power supplies.

**3018 PC Hardware: Troubleshooting and Maintenance**

3 credit hours, 5 contact hours (2 hours lecture and 3 hours lab). Prerequisite: 3012 (or equivalent computer operation experience).

This course offers a detailed study of microcomputer systems hardware modules. Combining theory and practice the course will cover module level maintenance, repair, replace, and retrofit and upgrading trade-off decision parameters; and introductory troubleshooting, with a focus on software troubleshooting. Students will remove and replace defective modules, perform hardware upgrades, and install software with attendant hardware boards. Students will gain experience in the assembly and disassembly of microcomputer stems.

### **3019 Electronic Drafting and Fabrication**

4 credit hours, 6 contact hours (3 hours lecture and 3 hours lab). Prerequisite: None.

This is a basic course that introduces electronic components, schematic symbols and basic drafting skills to electronic technology students. By assembling a small electronic instrument, students learn planning and design, component identification, breadboarding, printed circuit board technology, soldering, chassis assembly, troubleshooting approaches, calibration and meter use. Safety is emphasized throughout the course. Students are also introduced to software used for drawing schematics, circuit simulation, and PCB design. Fundamental drafting concepts and skills are also covered.

### **3020 Trigonometry**

5 credit hours, 5 contact hours (5 hours lecture and 0 hours lab). Prerequisite: 1210 or score of at least 76 on COMPASS Elementary Algebra test.

Concepts of trigonometry including the graphing of trigonometric functions. Radicals, exponential functions, and logarithms are discussed.

### **3025 Physics--Mechanics**

5 credit hours, 6 contact hours (4 hours lecture and 2 hours lab). Prerequisite: 3020, or concurrent enrollment in 3020, or score of at least 46 on COMPASS Trigonometry test.

Introduces the fundamental concepts of force, motion, statics, dynamics, and gravity. The study of energy, work, and power, with applications to basic machines and the practical effects of friction are included.

### **3026 General Physics**

5 credit hours, 6 contact hours (4 hours lecture and 2 hours lab). Prerequisite: C (2.00) grade or better in 1210.

This course will prepare the student for more complex courses in Forensic Science. The student will learn fundamental ideas of measurements, motion, energy, electricity, magnetism and heat. The student will be introduced to atomic and nuclear physics including basic protection. The student will apply these principles in a lab setting.

### **3027 Circuits II**

5 credit hours, 7 contact hours (3 hours lecture and 4 hours lab). Prerequisite: 3017 and 3020 (or score of at least 46 on COMPASS Trigonometry test).

The concepts introduced in 3017 are reviewed and applied to AC circuits. New concepts introduced include AC phasers, series and parallel AC networks, impedance, resonance, transformers, and 3 phase power. Laboratory experience emphasizes constructing circuits, troubleshooting, and using the oscilloscope to verify lecture material.

### **3031 Calculus**

3 credit hours, 4 contact hours (2 hours lecture and 2 hours lab). Prerequisite: 3020 or score of at least 46 on COMPASS Trigonometry test.

An introduction to the principles of Analytic Geometry to develop an understanding of graphic functions. These concepts are expanded to the calculus or rate of change expressed through algebraic functions, derivatives, maximum and minimum velocity, temperature, costs and the applications of the integral in areas, volumes, pressure, power, electrical charge, and work; with the emphasis on their application as related to the engineering technician.

### **3032 Physics of Heat, Light, Sound**

3 credit hours, 4 contact hours (2 hours lecture and 2 hours lab). Prerequisite: 3025.

Fundamental concepts of matter including the properties of solids, liquids and gases. Temperature scales and the effect of heat on matter. The gas laws and change of state. Simple harmonic motion and the nature of sound. The nature of light and illumination, including applications of light: reflection, refraction, and dispersion.

### **3043 Electric Fundamentals**

3 credit hours, 5 contact hours (2 hours lecture and 3 hours lab). Prerequisite: 3001 and 3020 (or score of at least 46 on the COMPASS Trigonometry test), or permission of the instructor or Division Chair).

This is a survey of basic electrical and electronic circuitry for non-electric majors. Elementary concepts of AC, DC, motors, transformers, power distribution, controls, rectifiers and wiring are presented. Emphasis is on practical applications. Laboratory exercises include connecting circuits and equipment, use of voltmeter, ohmmeter, oscilloscope, and troubleshooting.

### **3131 Electronics**

5 credit hours, 8 contact hours (3 hours lecture and 5 hours lab). Prerequisite: 3027.

Includes the theory and the operation of semiconductor diodes and transistor circuit configurations. Equivalent circuits, large and small signal analysis, and biasing circuits are also discussed. Laboratory sessions emphasize the use of the transistor as an audio amplifier.

### **3132 Communications Electronics I**

4 credit hours, 6 contact hours (2 hours lecture and 4 hours lab). Prerequisite: 3131.

Includes the theory and operation of power supplies, oscillators, AF and RF amplifiers, AM Transmitters and Receivers, SSB, Testing and Alignment, and Troubleshooting of Communication Systems. Laboratory experiences consist of construction of basic circuits, test and repair of commercial units, and the use of specialized test equipment.

### **3144 Linear Integrated Circuits**

4 credit hours, 6 contact hours (3 hours lecture and 3 hours lab). Prerequisite: 3031 and 3131.

Includes semi-conductor devices and circuits, junction field effect transistors, MOSFET, linear integrated circuits, operational amplifiers and optoelectronic devices.

### **3152 Communications Electronics II**

3 credit hours, 5 contact hours (2 hours lecture and 3 hours lab). Prerequisite: 3132.

Continues the concepts presented in 3132 and introduces AM-FM broadcasting, stereo, wave propagation, antennas, directional antennas, transmission lines and special communication techniques, satellite, fiber optic, microwave and data communications. The laboratory work consists of testing and troubleshooting existing equipment and systems.

### **3154 Digital Electronics I**

4 credit hours, 6 contact hours (3 hours lecture and 3 hours lab). Prerequisite: 3012 or (concurrent enrollment) or (permission of the instructor or the Division Chair).

Students pursue the study of digital logic elements such as logic gates, flip-flops, counters and shift registers. The study of math as used in digital circuits is covered in laboratory and lecture.

### **3164 Digital Electronics II**

4 credit hours, 6 contact hours (3 hours lecture and 3 hours lab). Prerequisite: 3012 and 3154 or equivalent.

The architecture of a microprocessor is studied in this course. The buss architecture of several common busses will be discussed. The programming of a microprocessor in both machine and assembly language will be introduced.

### **3167 Digital Electronics III**

4 credit hours, 6 contact hours (3 hours lecture and 3 hours lab). Prerequisite: 3164.

The study of circuit elements used in microprocessor systems. Includes the study of microprocessor busses, memory devices, series and parallel output devices and programmable peripheral interface devices. Laboratory projects focus on the application of these devices and the associated control software.

### **3243 Hydraulics and Pneumatics**

4 credit hours, 6 contact hours (2 hours lecture and 4 hours lab). Prerequisite: 3025.

This course covers hydraulic and pneumatic fluid power systems. First, basic principles and laws and their influence are described. Types of pressure, flow, and directional control valves are presented and analyzed. Students learn to select and size pumps and actuators for specific applications. Complete circuits are studied and analyzed, and basic electrical control of fluid power circuits is introduced.

### **3244 Industrial Power**

4 credit hours, 6 contact hours (3 hours lecture and 3 hours lab). Prerequisite: 3027.

This course covers the use and control of industrial electronic power. Control of AC loads with semiconductor devices used in conjunction with phase-shift, timing, and optoelectronics is explored and reinforced with laboratory experiments. Types of DC and AC single and three phase motors and their operating characteristics are studied. Basic motor control devices and circuits as well as current electronic motor control technology are studied and then used in the lab. During these laboratory experiences, students will also learn wiring practices and how to select and apply proper protection devices.

### **3252 Programmable Logic Controllers**

4 credit hours, 6 contact hours (2 hours lecture and 4 hours lab). Prerequisite: 3154.

This course includes electrical control of Fluid Power/Electrical systems with relay ladder diagrams, but concentrates mainly on PLC's and their use for control of on/off electrical devices. Sensing devices such as limit and temperature switches and control switches and their use in ladder circuits are reviewed. Timing and counting devices as well as event-driven and time-driven sequencing schemes are studied. Architecture, use, and programming of PLC's are covered and reinforced in practically oriented laboratory projects.

### **3253 Mechanical Components and Mechanisms**

3 credit hours, 5 contact hours (2 hours lecture and 3 hours lab). Prerequisite: 3020 (or score of at least 46 on the COMPASS Trigonometry test) and 3025.

Mechanical elements of power transmission including gears, levers, chains, belts, and pulleys are introduced and the student will learn basic design rules for these elements. The course also includes analysis of simple power trains and linkage devices, and the study of the nature of gear tooth contact.

### **3257 Statics and Strength of Materials I**

3 credit hours, 3 contact hours (3 hours lecture and 0 hours lab). Prerequisite: 3020 (or score of at least 46 on the COMPASS Trigonometry test) and 3025.

Includes the study of static forces and equilibrium and the resultant stress, strain, deformation, failure and strength requirements in straight line tension structures, compression and bearing members, shear elements, torsion elements, and angled structures.

### **3258 Statics and Strengths of Materials II**

3 credit hours, 3 contact hours (3 hours lecture and 0 hours lab). Prerequisite: 3257.

Includes the study of static forces and equilibrium and the resultant stress, strain, shear and bending considerations in the design and selection of trusses, rectangular beams, built up beams, and standard structural members.

### **3261 Electromechanical Systems**

5 credit hours, 9 contact hours (3 hours lecture and 6 hours lab). Prerequisite: 3252.

This is the capstone course for the Electromechanical Engineering Technology program. Concepts and applications of sensors, controllers, actuators, and industrial processes used in closed loop process control are studied. System stability and controller tuning are explored. The use of PLC's for analog process control is also covered. Students will make use of material from previous courses to complete design projects typical of industrial process control applications.

### **3262 Industrial Instrumentation**

4 credit hours, 6 contact hours (2 hours lecture and 4 hours lab). Prerequisite: 3017 or 3043 and 3032.

Students will measure various physical quantities by using industrial sensors. Specifications and suitable applications as well as calibration procedures for different types of sensors will be discussed. Process and Instrumentation Drawings (P&ID) are introduced.

### **3303 Project and Certification**

2 credit hours, 4 contact hours (0 hours lecture and 4 hours lab). Prerequisites: Second year standing in Electronic Engineering Technology.

This course is divided into two components; the first consists of information on various technician certification and licensing, application for testing and practice testing. The second component is the preparation and planning for the TET project. The project should involve original research, if possible, or design of a circuit or process to satisfy a data communication problem.

### **3304 Video Systems**

3 credit hours, 4 contact hours (2 hours lecture and 2 hours lab). Prerequisite: 3152.

This course emphasizes modern aspects of electronic communication systems and an in depth study of fiber optics, television systems, microwave equipment, satellite receiver equipment, CATV, DBS, HOTV, and systems design and analysis.

### **3306 Local Area Networks**

3 credit hours, 5 contact hours (2 hours lecture and 3 hours lab). Prerequisite: 3012 (or equivalent computer operation experience).

This course is an introduction to local area networking with personal computers in small

environments such as offices. Subjects covered includes planning a LAN, selecting hardware and software, net management, installation, troubleshooting, and Internet working. Laboratory exercises involve constructing and operating a LAN. No knowledge of electronics is necessary, but familiarity with personal computer operation would be helpful, particularly the IBM PC and DOS.

### **3308 Telecommunications Capstone Course**

1 credit hour, 3 contact hours (0 hours lecture and 3 hours lab). Prerequisite: 3303.

This course follows 3303 and is the implementation of the plan developed there. The student will construct, perfect, and demonstrate the project to the faculty and students and will submit a final report.

### **3316 Local Area Networks - Novel**

4 credit hours, 5 contact hours (3 hours lecture and 2 hours lab). Prerequisite: 3306.

This course teaches the student to set up and maintain Novel networks. The student will install a Novel network and set up the working environment. The student will also learn how to detect and correct software and hardware errors associated with the network components.

### **3320 Data Communications**

4 credit hours, 6 contact hours (3 hours lecture and 3 hours lab). Prerequisite: 3167 and 3306 or permission of the instructor.

This course introduces basic fundamentals related to data communication: analog and digital communication, multiplexing telephone systems, codes and formats, and error detection and correction.

### **3326 Local Area Networks - NT**

4 credit hours, 5 contact hours (3 hours lecture and 2 hours lab). Prerequisite: 3306.

This course teaches the student to set up and maintain Microsoft NT networks. The student will install a NT network and set up the working environment. The student will also learn how to detect and correct software and hardware errors associated with the network components and applications.

### **3411 Materials of Manufacturing**

2 credit hours, 3 contact hours (1 hours lecture and 2 hours lab). Prerequisite: None.

This course explores the properties and uses of various Ferrous and Non-Ferrous metals used in the manufacturing process. Some basic testing processes are introduced.

### **3416 Machine Tool Practices**

3 credit hours, 6 contact hours (1 hour lecture and 5 hours lab). Prerequisite: 1205 (or concurrent enrollment) with C grade [2.00] or better (or score of at least 10 on COTC

Algebra Skills, test or score of at least 43 on COMPASS Elementary Algebra test) and 3013 (or concurrent).

The student will learn to use precision and non-precision measurement tools and when each tool is appropriate to use, basic turning on a lathe, basic milling, drilling, hand threading, hand tools, saws, grinders. The student will develop skills through laboratory activities and project development.

### **3417 Forming Processes**

3 credit hours, 6 contact hours (1 hour lecture and 5 hours lab). Prerequisite: 3416 and 3712.

This course covers forming processes used in industry. In the plastics area; injection molding, extrusion, blow molding, thermoforming, and spray-up are studied. Students also study metal casting, bending and stamping processes.

### **3418 Welding**

2 credit hours, 4 contact hours (1 hour lecture and 3 hours lab). Prerequisite: 3013 or equivalent.

This course covers the basics of gas cutting and welding, inert gas (MIG,TIG) stick, and production welding. Also covered are weld symbols, basic design and testing.

### **3419 Production Planning and Control**

4 credit hours, 5 contact hours (3 hours lecture and 2 hours lab). Prerequisite: 3422.

This course covers systems and controls within the manufacturing process, which will provide the most efficient transformation of raw materials into useful goods. Specifically the student will learn to evaluate the manufacturing functions and learn how the elements can be integrated into the best possible system. The student will develop quantitative means for evaluating the manufacturing function.

### **3422 Production Management**

3 credit hours, 6 contact hours (1 hour lecture and 5 hours lab). Prerequisite: 3013, 3416, and 3712.

This course introduces the student to the industrial organization and technology of managing a production facility. The students will organize themselves into a production company and mass-produce a product.

### **3432 Manufacturing Management**

3 credit hours, 4 contact hours (2 hours lecture and 2 hours lab). Prerequisite: 3419.

This course explores the manufacturing organization, with specific emphasis on the basic skills required to practice successful management of people. It will provide the student with an understanding of labor/management relations and the influence of government regulations on issues concerning hiring, safety, health, and the environment.

### **3444 Building Mechanical Systems**

3 credit hours, 5 contact hours (2 hours lecture and 3 hours lab). Prerequisite: 3765 or permission of instructor.

Mechanical systems for residential buildings are the focus for this course. Topics covered include plumbing supply and drain, waste, vent design, heat loss and gain calculations, furnace and air conditioner sizing using the psychometric chart, and electric distribution including placement of service entrance, outlets, switches, and lighting. Students are also introduced to standard drawing symbols by adding these systems to house plans and reading sample prints.

### **3457 CNC Mill**

3 credit hours, 6 contact hours (0 hours lecture and 6 hours lab). Prerequisite: 3416, 3422 and 3020 or concurrent.

This course introduces the student to the basic processes needed to control a CNC mill for production using programming techniques including canned cycles. The student will also have introductory exercises in the use of a CAD/CAM system.

### **3458 CNC Lathe**

3 credit hours, 6 contact hours (0 hours lecture and 6 hours lab). Prerequisite: 3457.

This course introduces the student to the basic processes needed to control a CNC lathe for production using programming techniques including canned cycles. The student will also have introductory exercises in the use of a CAD/CAM system.

### **3502 Statistical Quality Control**

4 credit hours, 5 contact hours (3 hours lecture and 2 hours lab). Prerequisite: 1210 or score of at least 76 on COMPASS Elementary Algebra test.

A broad overview of the quality control function in industry. The philosophy of modern quality control, basic probability, control chart applications, acceptance sampling plans, frequency distributions, process capability studies, and other economic considerations are presented.

### **3701 Civil Cad**

2 Credit Hours, 3 contact hours (1 hour lecture and 2 hours lab). Prerequisite: 3708 and 3730 or 3724 or permission by instructor.

This course will introduce the student to the use of CAD in preparation of civil drawings and calculations. Includes subdivision layout, contours, profiles, highway layout, and earthwork.

### **3705 Basic Web Site Construction**

2 credit hours, 3 contact hours (1 hour lecture and 2 hours lab). Prerequisite: 3012 or equivalent computer experience.

In this course the student will learn the skills necessary to construct a basic Internet website for personal or business use. Hyper Text Mark-Up Language (HTML) coding fundamentals are described and each student will be able to explore these concepts by creating a site with their own material. Topics include: Introduction to the Internet; Text and Heading Formatting; Lists; Linking Documents and Other Objects; Using Backgrounds, Images and Animation and Sound; Tables; Frames; and Site Management.

### **3706 Introduction to CAD**

2 credit hours, 3 contact hours (1 hour lecture and 2 hours lab). Prerequisite: Previous drafting experience preferred.

This is the first course in a series of Computer Aided Drafting courses. The students will gain familiarity with the system hardware, peripherals and software. They will learn to construct a basic dimensioned orthographic drawing with the CAD system.

### **3707 Intermediate CAD**

2 credit hours, 3 contact hours (1 hour lecture and 2 hours lab). Prerequisite: 3013 (or previous drafting experience) and 3706 (or passing grade on pre-test).

This is the second in a series of CAD courses building on a foundation of Introduction to CAD. Advanced concepts in CAD will be explored including symbol libraries, isometric and 3D constructions, using the block commands, creation of bill of materials and MS-DOS usage.

### **3708 Advanced CAD**

2 credit hours, 3 contact hours (1 hour lecture and 2 hours lab). Prerequisite: 3707 within the last year (or passing grade on pre-test).

This course, the third in a series, builds on the concepts established in the first two CAD courses in which the student uses LISP routines to create custom menus, and to manipulate system variables. The concepts of 3-D drawing are taught include wire-frames, surfaced models, solid models, and rendering.

### **3710 Advanced Architectural Software**

2 credit hours, 3 contact hours (1 hour lecture and 2 hours lab). Prerequisite: 3708 within the last year (or passing grade on pre-test).

This advanced CAD course is the fourth in the CAD sequence, structured for students in the Drafting and Design Technology, Architectural Major. It focuses on the use of a third party software program which enhances the CAD program for use in architectural applications. The students will use the computer systems to produce both 2D and 3D architectural plans, details, schedules, roof forms, elevation drawings, and equipment layouts.

### **3712 Mechanical Design I**

3 credit hours, 4 contact hours (2 hours lecture and 2 hours lab). Prerequisite: 3013 (or

concurrent enrollment).

The drafting techniques required for the complete communication of the manufactured objects are presented. Basic machine detail drafting techniques are practiced and then applied to practical design problems. Basic design calculations and assembly drawings are also practiced.

### **3721 Herbaceous Ornamentals**

2 credit hours, 3 contact hours (1 hour lecture and 2 hours lab). Prerequisite: 3723.

The identification, culture, and indoor and outdoor use of herbaceous perennials; this course includes selection, growth habits pests, diseases and planting techniques.

### **3722 Landscape Design I**

5 credit hours, 10 contact hours (0 hours lecture and 10 hours lab). Prerequisite: 3721 and 3723.

A beginning course in landscape drafting, design ,and planning; emphasizing proper planning procedures, drafting techniques, and design representation, and the functional and aesthetic use of landscape material.

### **3723 Woody Ornamentals**

2 credit hours, 3 contact hours (1 hour lecture and 2 hours lab). Prerequisite: None.

The identification, cultural practices and use of woody trees, shrubs, and vines; this course includes selection, growth habits, pests, diseases, and planting techniques.

### **3724 Landscape Design II**

5 credit hours, 10 contact hours (0 hours lecture and 10 hours lab). Prerequisite: 3722.

The second course in a series of three, with emphasis on the drafting, design and planning of grading, construction, drainage and irrigation techniques.

### **3725 Landscape Design III**

5 credit hours, 10 contact hours (0 hours lecture and 10 hours lab). Prerequisite: 3724.

The third course in a series of three; which deals primarily with plan presentation, cost estimates, specifications and contracts.

### **3726 Plant Installation and Maintenance**

2 credit hours, 4 contact hours (0 hours lecture and 4 hours lab). Prerequisite: 3725 (or concurrent).

This course deals primarily with plant installation and maintenance in the field; and the construction of features such as decks, patios, steps, walks and streams.

### **3727 Landscape Design I**

4 credit hours, 7 contact hours (2 hours lecture and 5 hours lab). Prerequisite:

A beginning course in landscape drafting, design ,and planning; emphasizing proper planning procedures, drafting techniques, and design representation, and the functional and aesthetic use of landscape material.

### **3728 Drafting II**

3 credit hours, 6 contact hours (0 hours lecture and 6 hours lab). Prerequisite: 3013.

Developing the techniques learned in 3013, continues the study of drafting with the main emphasis on orthographic projection, sectioning, isometric drawings, perspectives, geometric constructions, auxiliary views, and lettering. Correct use of drafting instruments in the production of these types of drawings is stressed.

### **3729 Landscape Design II**

4 credit hours, 7 contact hours (2 hours lecture and 5 hours lab). Prerequisite: 3727.

The second course in landscape drafting, design ,and planning; with emphasis on the drafting, design and planning of grading, construction, drainage and irrigation techniques.

### **3731 Introduction to Civil Drafting/Design**

3 credit hours, 5 contact hours (2 hours lecture and 3 hours lab). Prerequisite: 1210 or concurrent enrollment in 1210 and 3013 or concurrent enrollment in 3013.

This course is an introduction to the methods and practices of civil drafting. Includes surveying fundamentals, mapping, plot plans, contours, profiles, and highway layouts.

### **3732 Civil Soils**

2 credit hours, 3 contact hours (1 hour lecture and 2 hours lab). Prerequisite: 3730.

This is a course in the identification and classification of soils. Topics covered include the Unified and American Association of State Highway and Transportation Officials methods.

### **3733 Civil Drafting/Design II**

4 credit hours, 7 contact hours (2 hours lecture and 5 hours lab). Prerequisite: 3707, 3731 and 3755.

This course, the second in a series of three civil drafting and design courses, focuses on site grading/earthwork and storm and wastewater systems.

### **3734 Civil Steel**

2 credit hours, 3 contact hours (1 hour lecture and 2 hours lab). Prerequisite: 3258, 3732, and 3748, or concurrent enrollment in 3258.

This is a course covering the fundamentals of structural steel drafting and design. Topics covered include practices and methods used in the graphical representation of steel structures. Basic stress calculations and design concepts are studied for use in either a simplified design, detailing, or inspection role.

### **3735 Civil Concrete**

2 credit hours, 3 contact hours (1 hour lecture and 2 hours lab). Prerequisite: 3258, 3732, 3748, or concurrent enrollment in 3258.

This is a course covering the fundamentals of reinforced concrete design and drafting. Topics covered include practices and methods used in the graphical representation of concrete structural elements. Basic stress calculations and design concepts are studied for use in either a simplified design, detailing, or inspection role.

### **3736 Civil Drafting/Design III**

4 credit hours, 7 contact hours (2 hours lecture and 5 hours lab). Prerequisite: 3733 and 3734.

This course, the third in a series of three civil drafting and design courses, focuses on transportation systems and subdivision design. Topics covered include highways, urban roadways and railroads, and survey controls used in the design and layout of subdivision plats.

### **3739 Drafting III**

3 credit hours, 6 contact hours (0 hours lecture and 6 hours lab). Prerequisite: 3706 and 3728 or concurrent.

This is the third in a series of drafting courses using both manual and CAD drafting methods. This course develops concepts in geometric dimensioning and tolerancing, threaded fastener designation and use. Also covered is welding symbols and joint design, structural steel detailing and piping layout.

### **3740 Graphics**

2 credit hours, 4 contact hours (1 hour lecture and 3 hours lab). Prerequisite: 3020 (or score of at least 46 on COMPASS Trigonometry test), 3708 and 3728.

This course introduces descriptive geometry to the students by presenting practical problems which are solved using this graphic method work on CAD. The methods of constructing shades and shadows are taught and applied to both mechanical and architectural drawing projects.

### **3743 Mechanical Design II**

5 credit hours, 10 contact hours (0 hours lecture and 10 hours lab). Prerequisite: 3416, 3707, 3712, and 3738.

The second in the series of Mechanical Design courses, this course specializes in mechanical design involving the principles of production, fasteners, with an emphasis on

tolerances in the design and detail drawings of basic machines. Computer Aided Design is introduced in this course and its use is carried through all the mechanical design courses.

### **3747 Landscape Design III**

4 credit hours, 7 contact hours (2 hours lecture and 5 hours lab). Prerequisite:

The third course in a series of three; which deals primarily with plan presentation, cost estimates, specifications and contracts.

### **3748 Materials of Construction**

5 credit hours, 6 contact hours (4 hours lecture and 2 hours lab). Prerequisite: 1210 (or score of at least 76 on COMPASS Elementary Algebra test) and 3755.

An overview of the fundamental characteristics of the most frequently used materials in modern construction is presented. Proper use of materials, construction methods, and detailing practices are investigated.

### **3749 Landscape Plants**

4 credit hours, 6 contact hours (2 hours lecture and 4 hours lab). Prerequisite: None.

The identification, cultural practices, and use of woody trees, shrubs, and vines and herbaceous perennial plants. Includes selection, growth habits, pests, diseases, and planting techniques.

### **3752 Mechanical Design III**

5 credit hours, 10 contact hours (0 hours lecture and 10 hours lab). Prerequisite: 3257, 3708 and 3743.

This course includes an introduction to the calculation and design of dies, jigs, fixtures, and the study of gauges for dimensional control. The design of a major machine project is required of each student.

### **3755 Architectural Design I**

5 credit hours, 10 contact hours (0 hours lecture and 10 hours lab). Prerequisite: 3001 (or concurrent enrollment in 3001), 3013 and 3728.

This course, the first in a series of four, presents the theories and practices used in architectural drafting and design. Emphasis is on developing skills required in the production of a set of architectural working drawings. The theories and techniques used in surveying are presented and practiced and survey drawings are produced. Detail design, basic structural design, and material's take-offs and cost estimating are also introduced.

### **3762 Mechanical Design IV**

5 credit hours, 10 contact hours (0 hours lecture and 10 hours lab). Prerequisite: 3752.

This is the final course in a series. This course includes product designs, solution of vector

and rotational forces, linkage and joint design, and bearing selection, through a format of real life projects.

### **3765 Architectural Design II**

5 credit hours, 10 contact hours (0 hours lecture and 10 hours lab). Prerequisite: 3706 and 3755.

In this course, the second of a series of four, students are given a sequence of drafting and design projects involving residential construction. Computer Aided Drafting is introduced and carried through the remaining Architectural Design series.

### **3775 Architectural Design III**

5 credit hours, 10 contact hours (0 hours lecture and 10 hours lab). Prerequisite: 3707 and 3765.

The focus of this course, the third in the Architectural Design sequence, is on commercial construction. Both manual and CAD drafting are employed to produce a series of working drawings representative of each type drawn for a commercial building. The Ohio Basic Building Code is reviewed as it relates to the design of a specific project.

### **3780 Advanced Design**

4 credit hours, 6 contact hours (2 hours lecture and 4 hours lab). Prerequisite: Second year standing, 45 credit hours in the Engineering Division, and 1505, 3257 and 3708.

This is a capstone course structured to aid the student in applying many of the skills they have learned to the solution of a real world engineering problem. The students must work in teams to design, build and test their solution. The culmination of the course is a report documenting the design, and testing of the prototype.

### **3785 Architectural Design IV**

5 credit hours, 10 contact hours (0 hours lecture and 10 hours lab). Prerequisite: 3708 and 3775.

The final in a series of four, this course reinforces the concepts and techniques covered in the preceding Architectural Design courses by providing the student the experience of working on an actual building project. Site investigation, building and site design, zoning and building code research, material selection, and production of architectural design and working drawings are all actively practiced by the student.

### **3790 Graphic Design Capstone**

2 credit hours, 4 contact hours (1 hour lecture and 3 hours lab). Prerequisite: 20 credit hours toward the Graphic Design Certificate and 2950 and 2963.

This course is an application course in which the student will complete several real world projects in graphic design.

### **3910 Cooperative Work Experience/Architectural**

5 credit hours, 20 contact hours (0 hours lecture and 0 hours lab, 20 hours co-op directed practice). Prerequisite: 3706, 3728, 3755 (or concurrent), grade point average of 2.75 or greater, and permission of faculty advisor.

This course, to be taken toward the end of the two-year Drafting and Design Technology, Architectural Major curriculum, is designed to give the student a real-world, office, work experience which uses the skills acquired earlier in the program. The course acts as a capstone, tying the concepts of the technology together and giving the student valuable job experience before graduation.

### **3990 Field Experience - Engineering**

1-3 credit hours depending on the amount of work experience per week (1 credit hour per 12 hours work experience). Repeatable up to 12 credit hours. Prerequisite: 1522, 45 credit hours completed, and permission of Division Chair. S/U Graded Course.

This flexible course offering is composed of a paid work experience coordinated by the student's advisor. The work experience must be related to the student's academic program. Elective credit is awarded on a satisfactory/unsatisfactory basis.

### **39XX Special Topics in Engineering**

1-5 credit hours. Prerequisite: Permission of instructor and Division Chair.

Special topic study is designed to provide a student with the opportunity to work on special topics within the field of engineering under the directive of the Engineering faculty. This course may be substituted for an engineering technical elective course if it is applicable. The course may be repeated.