

ENGINEERING & ELECTRONICS TECHNOLOGY (ELT)

ELT 102 (2 credit hours)

Blueprint Reading

A comprehensive study of current drafting standards and blueprint reading techniques are included. Topics include standard lines and symbols, sketching techniques, orthographic projection, auxiliary views, detail and assembly drawings, dimensions, tolerances, sectional views, title block information, machining, specifications, and specialized forms of engineering drawings. Lecture: 2.0 (30 contact hours).

Attributes: Technical

Components: LEC: Lecture

ELT 103 (3 credit hours)

Introduction to Engineering

Provides an introduction to the engineering profession, engineering disciplines, and technology. Emphasizes a problem-solving approach, engineering design process, and team projects. Includes an introduction to engineering graphics. Intended for students of all majors. Lecture/Lab: 3.0 credits (60 contact hours).

Pre- or co-requisite: Current Placement Scores for College Level Quantitative Reasoning or Consent of Instructor.

Attributes: Technical

Components: LEC: Lecture

ELT 106 (2 credit hours)

Mechanical Engineering Graphics

Includes basic technical sketching and working drawings as applied to mechanical engineering. Students will create or analyze multi-view drawings, symbols, schematics, and sketches typical of mechanical graphics drawings. Lab: 2.0 credits (90 contact hours).

Attributes: Technical

Components: LAB: Laboratory

ELT 107 (4 credit hours)

Computer Applications for Technicians

Introduces computer applications commonly used in technical occupations. Covers circuit analysis, computational, analytical, and other software packages. Lecture: 1.0 credit (15 contact hours). Lab: 3 credits (90 contact hours).

Attributes: Course Also Offered in Modules, Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 110 (5 credit hours)

Circuits I

Introduces application of basic DC and AC circuits, including circuit analysis techniques with discussion of introductory magnetism and transformer principles. Emphasizes design, construction, and troubleshooting of simple DC and AC circuits in laboratory exercises. Lecture: 3 credits (45 contact hours). Laboratory: 2 credits (60 contact hours).

Pre-requisite: MAT 61 or equivalent placement level or Consent of Instructor.

Attributes: Course Also Offered in Modules, Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 114 (5 credit hours)

Circuits II

Addresses theory and application of complex alternating current and direct current circuits. Emphasizes impedance, reactance, power and electrical energy, electrical measurement instruments, and circuit analysis. Lecture: 3.0 credits (45 contact hours). Laboratory: 2.0 credits (60 contact hours).

Pre-requisite: (ELT 110 with a grade of C or greater) or Consent of Instructor.

Attributes: Course Also Offered in Modules, Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 118 (3 credit hours)

Computer Numerical Control

Introduces computer numerical control technology, covering programming and metal removal techniques. Includes topics of controllable machine components, tools, programmable functions, control system components, physics of metal cutting, metal cutting data, coordinate systems, NC related dimensioning, and CNC programming. Lecture: 2.0 credits (30 contact hours), Lab: 1.0 credit (30 contact hours).

Pre-requisite: Consent of Instructor.

Attributes: Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 120 (3 credit hours)

Digital I

Introduces theory and application of digital logic methods. Includes Boolean algebra, combinational logic theory, sequential circuits, number systems and codes, and design and troubleshooting of digital logic circuits. Lecture: 2 credits (30 contact hours). Laboratory: 1 credit (30 contact hours).

Pre-requisite: MAT 61 or equivalent placement level or Consent of Instructor.

Attributes: Course Also Offered in Modules, Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 122 (3 credit hours)

Mechanical Power Transmission Systems

Introduces industrial mechanical systems and devices, which are commonly associated with Millwright and Industrial Maintenance functions. Includes topics of belt drives, gear drives, chain drives, couplings, packings/seals, bearings, mechanical fasteners, pipe fittings, pumps, and valves. Lecture: 3.0 credit (45 contact hours).

Co-requisite: ELT 124.

Attributes: Technical

Components: LEC: Lecture

ELT 124 (1 credit hours)

Mechanical Power Transmission Systems Lab

Introduces mechanical systems and devices common to the Millwright and Industrial Maintenance trades. Includes topics of belt drives, gear drives, chain drives, couplings, packings and seals, bearings, mechanical fasteners, pipe fittings, pumps, and valves. Lab: 1.0 credit (30 contact hours).

Co-requisite: ELT 122.

Attributes: Technical

Components: LAB: Laboratory

ELT 201 (4 credit hours)**Statics and Strength of Materials**

Introduces static equilibrium involving forces, moments, couples, and equivalent systems. Explores stresses, strains and deflections associated with trusses, frames, beams, columns, and joints. These devices are subjected to various loadings and environments, and are made of standard construction materials. Lecture: 2.0 credits (30 contact hours), Lab: 2.0 credits (30 contact hours).

Pre-requisite: (MAT 150 and MAT 155 or MAT 110) or consent of instructor.

Attributes: Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 210 (4 credit hours)**Devices I**

Provides basic theory and application of semi-conductor devices. Emphasizes design, construction and troubleshooting of diode and transistor circuits, amplifiers and power supplies. Lecture: 3.0 credits (45 contact hours), Lab: 1.0 credit (30 contact hours).

Pre-requisite: (ELT 110 with a grade of C or greater) or Consent of Instructor.

Attributes: Course Also Offered in Modules, Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 214 (4 credit hours)**Devices II**

Covers theory and application of advanced semiconductor devices. Emphasizes thyristors, FETs, integrated circuits, and other devices as applied to audio frequency amplifiers, feedback circuits, modulators, detectors, and other basic electronic circuits. Lecture: 3.0 credits (45 contact hours), Lab: 1.0 credit (30 contact hours).

Pre-requisite: (ELT 210 with a grade of C or greater) or Consent of Instructor.

Attributes: Course Also Offered in Modules, Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 220 (3 credit hours)**Digital II**

Provides theory and application of advanced digital logic methods. Includes small and medium scale integrated circuits logic families, interfacing techniques, arithmetic circuitry, programmable devices, and an introduction to microprocessors. Lecture: 2.0 credits (30 contact hours). Lab: 1.0 credit (30 contact hours).

Pre-requisite: (ELT 120 with a grade of C or greater) or Consent of Instructor.

Attributes: Course Also Offered in Modules, Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 222 (3 credit hours)**Mechanics of Telephony**

Covers history of the telephone and regulations that impact the telecommunications industry, analog and digital transmission mediums, and the evolution of wireless and digital services. Utilizes the graduated height method for developing climbing skills and confidence. Lecture: 2.0 credits (30 contact hours). Lab: 1.0 credit (30 contact hours).

Pre-requisite: Consent of Instructor.

Attributes: Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 224 (3 credit hours)**Basic Telecommunications Installation and Maintenance**

Provides an overview of concepts needed to complete the duties of a telecommunications service technician and provide the foundational basic skills and knowledge required to effectively perform the installation and maintenance job duties and functions. Introduces fiber optic transmissions and cable repair. Lecture: 1.0 credit (15 contact hours). Lab: 2.0 credits (60 contact hours).

Pre-requisite: Consent of Instructor.

Attributes: Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 232 (3 credit hours)**Computer Software Maintenance**

Includes maintenance of the personal computer with an emphasis on installation, upgrading, and configuration of the operating system. Covers memory management, boot sequences, printing subsystem, application software and networking with troubleshooting as a main focal point including viruses. When combined with ELT 234, this course will help prepare students to take CompTIA A+ certification tests. Lecture: 2.0 credits (30 contact hours). Laboratory: 1.0 credit (30 contact hours).

Pre-requisite: (Computer literacy course or demonstrate competency) or consent of instructor.

Attributes: Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 234 (3 credit hours)**Computer Hardware Maintenance**

Covers maintenance of the personal computer with an emphasis on installation, upgrading, and configuration of computer hardware. Covers network and Internet access, internal addressing, architecture, interrupts complete PC construction and basic troubleshooting. When combined with ELT 232, this course will help prepare students to take CompTIA A+ certification tests. Lecture: 2.0 credits (30 contact hours). Lab: 1.0 credit (30 contact hours).

Pre-requisite: (Computer literacy course or demonstrate competency) or consent of instructor.

Attributes: Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 240 (6 credit hours)**Communications Electronics**

Provides the theory of AM and FM, RF communications, transmission, reception, multiplexing, and modern data communications. Lecture: 4.0 credits (60 contact hours). Lab: 2.0 credits (60 contact hours).

Pre-requisite: (ELT 220 and ELT 214) or Consent of Instructor.

Attributes: Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 244 (4 credit hours)**Electrical Machinery and Controls**

Covers the study of theory and utilization of electrical motors and generators, including AC and DC motors and drives. Includes theory and utilization of limit switches, solenoids, relays, contactors, and solid state devices in control circuits. Provides application of digital and analog control techniques, ladder logic, and programming techniques to industrial and manufacturing processes. Lecture: 3.0 credits (45 contact hours) Lab: 1.0 credit (30 contact hours).

Pre-requisite: Consent of instructor.

Attributes: Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 250 (4 credit hours)**Programmable Logic Controllers**

Covers the study of Programmable Logic Controllers with an emphasis on the function and use of PLCs in an industrial environment. Lecture: 3.0 credits (45 contact hours). Lab: 1.0 credit (30 contact hours).

Pre-requisite: ELT 244 or Consent of instructor.

Attributes: Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 260 (5 credit hours)**Robotic and Industrial Automation**

Introduces theory of robots including terminology, components, and basic programming. Provides theory and application of servo and non-servo robots. Includes robot types, controllers, manipulators, and basic robotic programming. Provides the theory and operation of flexible and computer-integrated manufacturing and control systems. Provides the opportunity to develop, set up work cells, and integrate the work cells into a total computer-integrated manufacturing system at a beginning level. Lecture: 3.0 credits (45 contact hours). Lab: 2.0 credits (60 contact hours).

Pre-requisite: Consent of Instructor.

Attributes: Course Also Offered in Modules, Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 261 (3 credit hours)**Instrumentation and Measurements**

Provides a study of instruments used by the mechanical engineering technician and training in the techniques of their use. Lecture: 3.0 credits (45 contact hours).

Attributes: Technical

Components: LEC: Lecture

ELT 264 (4 credit hours)**Mechanical Design**

Covers study techniques associated with the design of machine elements, including structural members subjected to combined stresses resulting from shear or torsion coupled with axial and bending loadings. Includes material treatments, failure theories, failure prevention, and steady and variable (fatigue) elements, including rotating shafts, pressure vessels, power screws, and attachment schemes. Lecture: 4.0 credits (60 contact hours).

Pre-requisite: (ELT 201 and PHY 211) or Consent of Instructor.

Attributes: Technical

Components: LEC: Lecture

ELT 265 (3 credit hours)**Applied Fluid Power**

Covers the fundamental types of hydraulic and pneumatic devices and circuits used in industry. Includes basic fluid mechanics, industrial hydraulic components, pneumatic components, circuit design and analysis, electrical control of fluid power circuits, and fluid power maintenance and safety. Lecture: 2.0 credits (30 contact hours). Lab: 1.0 credit (30 contact hours).

Attributes: Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 289 (1 credit hours)**Engineering and Electronics Technology Capstone**

Serves as the capstone course for the Engineering and Electronics Technology degree program and all of its concentrations. Integrates prior learning outcomes into a single integrated learning experience. Includes an exit exam that all program graduates must take. Lecture: 1.0 credit (15 contact hours).

Pre-requisite: (ELT 120 and ELT 210) or Consent of Instructor.

Attributes: Technical

Components: LEC: Lecture

ELT 290 (1-4 credit hours)**Selected Topics in Engineering Technology: (Topic)**

Offers selected topics in engineering technology, due to rapidly changing technology or in response to local needs. Includes various topics semester to semester at the discretion of the instructor. Course may be repeated with different topics to a maximum of eight credit hours. Lecture: 1.0-4.0 credit hours (15- 60 contact hours); Laboratory: 0-3.0 credit hours (0-45 contact hours).

Pre-requisite: Consent of instructor.

Attributes: Technical

Components: LAB: Laboratory, LEC: Lecture

ELT 295 (1-2 credit hours)**Independent Problems**

Provides an objective for independent study for engineering and electronics technology students using a problem or special project approved by the instructor. This course may be repeated twice or to a maximum of four credit hours. Lecture: 1.0 - 2.0 credits (15- 30 contact hours). Laboratory: 1.0 - 2.0 (30-60 contact hours)

Pre-requisite: Consent of instructor.

Attributes: Technical

Components: LAB: Laboratory, LEC: Lecture