Electronics (ELEC)

Courses

ELEC 120   Introduction to Electronics (3 Hours)
This is a beginning course in electronics technology that is appropriate for both electronic majors and other interested students. An overview of basic electronic theory, principles and components is presented. In addition, the laboratory exercises will emphasize the operation and use of the primary pieces of electronic test equipment and the fabrication of selected circuits.

ELEC 125   Digital Electronics I (4 Hours)
This is a beginning course in which students will study and practice the basic concepts of digital electronics. Topics will include digital number systems, logic gates, logic circuits, flip-flops, digital arithmetic, counters and registers.

ELEC 127   Robots for Humans (4 Hours)
This course is a general introduction to the rapidly growing field of robotics. The class will use lectures, demonstrations and lab work to teach the basics of robotics. This course is designed to assist new users in making use of this technology in their own lives and as an introduction for students wanting to proceed further into the field. 3 hrs lecture, 2 hrs open lab/wk.

ELEC 134   DC Circuits* (4 Hours)
Prerequisites or corequisites: ELEC 120.
This course covers resistive circuits having DC sources. Analysis topics include Ohm's law, Kirchoff's law, Watt's law, the superposition theorem, Thevenin's theorem and Norton's theorem. The current, voltage and resistance relationships in series, parallel and combination circuits will be studied.

ELEC 185   LAN Cabling and Installation (3 Hours)
This course is designed to provide specialized skills for installing and testing local area network cabling and wireless installation. Twisted-pair, coax and fiber cables will be introduced and contrasted based on their characteristics and applications. Laboratory exercises for terminating and testing network cables and installing wireless systems will accompany the lectures. Students will be trained how to use common wiring tools and testing instruments. Methods of documenting LAN systems will also be introduced.

ELEC 186   CompTIA A+ Essentials (3 Hours)
Students will gain the knowledge required to assemble components based on customer requirements, and to install, configure and maintain devices for end users. This course also covers the basics of networking and security/forensics, proper and safe diagnosis, and how to resolve and document common hardware issues while applying troubleshooting skills. 2 hrs lecture and 3 hrs. lab/wk.

ELEC 212   Fundamentals of Light and Lasers* (3 Hours)
Prerequisites : MATH 131 or higher.
This is the foundational course necessary for applying lasers and/or photonics to other technologies. It covers the basics of light and lasers that will allow a technician to continue his or her studies in any photonics-enabled technology. This course reviews the physics of light, geometrical and wave optics, light sources, basic optical material and lab equipment, laser principles, and laser safety.

ELEC 225   Digital Electronics II* (3 Hours)
Prerequisites : ELEC 125.
Students will continue their study of digital concepts and will learn how to build digital circuitry using digital integrated circuit chips and basic concepts of computer organization. In additional, emphasis will be placed on learning how to troubleshoot digital circuits and digital systems. Each student will build a digital computer through a series of laboratory projects.

ELEC 234   AC Circuits* (4 Hours)
Prerequisites : ELEC 134.
The analysis techniques presented in Electronics I will be applied to complex circuits driven by Alternating Current (AC) and pulsed sources. The responses of the circuits having resistance, impedance, inductive and capacitive reactance will be analyzed. Other topics will include transformers and electronic filters.

ELEC 235   Microprocessors* (4 Hours)
Prerequisites or corequisites: ELEC 225.
This course is designed to provide an introduction to advanced microcomputer concepts and applications. This course is a continuation of topics introduced in the Digital Electronics I and II classes. Included are hardware and software topics in operating systems, peripherals, displays, processors, storage media, maintenance, diagnostics and troubleshooting. Analog and digital data acquisition and processing will also be covered.

ELEC 236   Semiconductor Devices* (4 Hours)
Prerequisites or corequisites: ELEC 234.
Topics for this class include the analysis and understanding of diodes and transistors. Special purpose diodes, bipolar junction transistors (BJT) and field effect transistors (FET) will be examined. Additional topics include operational amplifiers (Op-Amps), four-layer semiconductor devices and voltage regulators. Op-Amp applications will cover comparators, summing amplifiers, integrators, differentiators and active filters.

ELEC 240   Electronic Communication Systems* (4 Hours)
Prerequisites or corequisites: ELEC 236.
This course provides a study of electronic communication systems used in today's world. Topics will include the electromagnetic spectrum, decibels, signal-to-noise ratio, AM and FM super-heterodyne radios, antennas, transmission lines and the Global Positioning System.

ELEC 250   Microcomputer Maintenance* (3 Hours)
Prerequisites : ELEC 186.
This course is a continuation of the study of personal computers and will further the student's ability to maintain and repair them. In addition, this course will assist the student in preparing for computer-maintenance certification. Topics will include interaction of hardware and operating systems, resource conflicts, networking capabilities, common hardware and software problems, hardware differences of portable computers and upgrading computers. The course topics will be supported by laboratory projects.

ELEC 251   Laser Systems and Applications* (3 Hours)
Prerequisites : ELEC 212.
Prerequisites or corequisites: ELEC 252.
Laser Systems and Applications covers more advanced concepts in photonics and the operating principles, output characteristics, diagnostics and applications for fiber- and diode-based lasers. These lasers will be classified according to their active medium, output wavelength and applications.

ELEC 252   Specialized Lasers and System Integration* (3 Hours)
Prerequisites : ELEC 251.
The advanced course will focus on the function on the Fiber Laser and the Diode (Semiconductor) Laser. Students will work with laser operation and safety procedures. Topics will also cover system integration and the subsystems required in today's industry that depend on Photonics.

ELEC 271   Electronics Internship I* (1-3 Hour)
Prerequisites : Department approval.
This course affords the student the opportunity to apply classroom knowledge to an actual work environment. It will provide selected advanced electronics technology students with appropriate on-the-job experience with area employers, under instructional oversight, that will promote the student's career goals. 18 hrs. approved and appropriate work activity/wk.

ELEC 291   Independent Study* (1-7 Hour)
Prerequisites : 2.0 GPA minimum and department approval.
Independent study is a directed, structured learning experience offered as an extension of the regular curriculum. It is intended to allow individual students to broaden their comprehension of the principles of and competencies associated with the discipline or program. Its purpose is to supplement existing courses with individualized, in-depth learning experiences. Such learning experiences may be undertaken independent of the traditional classroom setting, but will be appropriately directed and supervised by regular instructional staff. Total contact hours vary based on the learning experience.