ELECTRONICS TECHNOLOGY (ELECT)

ELECT 1100
Electricity and Electronics Fundamentals
3 Credit Hours
Basic concepts in electronics are studied. An overview of direct and alternating current, circuit laws, components, troubleshooting, and use of test equipment. Hands-on experience, projects, and practical applications are included. (2 lecture hours, 2 lab hours)

ELECT 1101
Circuits I
3 Credit Hours
Introduction to basic concepts in electronics and electricity. Topics include direct and alternating current, circuit laws, components, troubleshooting, and use of test equipment. Teamwork, critical thinking, and problem solving are emphasized. Hands-on experience and practical applications are included. (2 lecture hours, 2 lab hours)
Prerequisite: ELECT 1100 with a grade of C or better, or equivalent or consent of instructor.

ELECT 1102
Circuits II
4 Credit Hours
Advanced concepts in circuit electronics. Topics include filtering, resonance, time and frequency response, troubleshooting, and use of test equipment. Hands-on experience, practical applications, and projects are included. Teamwork, critical thinking, and problem solving are emphasized. (2 lecture hours, 4 lab hours)
Prerequisite: ELECT 1101 with a grade of C or better, or equivalent or consent of instructor.

ELECT 1110
Introduction to Technology
2 Credit Hours
Students will develop an understanding of the fields of technology such as computers, telecommunications, electronics, mechanics and other related fields. Through project based hands-on learning activities, students will have an opportunity to apply theory to real problems as they develop skills in solving technological problems. (1 lecture hour, 2 lab hours)

ELECT 1111
Introduction to Robotics
3 Credit Hours
Introduction to fundamental robotic concepts, basic robot characteristics, and review of robotic applications. Hands-on experience, practical applications and projects. Teamwork, critical thinking and problem solving are emphasized. (2 lecture hours, 2 lab hours)
Prerequisite: ELECT 1100 or equivalent, or consent of instructor.

ELECT 1118
Calculus for Electronics
2 Credit Hours
Basic principles of differential and integral calculus and differential equations applicable to circuit analysis. (2 lecture hours)
Prerequisite: MATH 1432 (or college equivalent) or qualifying score on the mathematics placement test or qualifying A.C.T. math score and ELECT 1102 or consent of instructor.

ELECT 1120
Electronic Documentation and Fabrication
3 Credit Hours
Introduction to electronic drafting and documentation. Topics include electronic schematics and documentation, printed circuit board documentation, drafting techniques using Computer Assisted Drafting and Design (CADD) software, and electronic manufacturing methods. (2 lecture hours, 2 lab hours)

ELECT 1130
Electronics Materials and Fabrication
2 Credit Hours
Electronic equipment construction, assembly, repair, cable soldering techniques and fabrication. Coverage of the fundamentals of electronic design, fabrication and documentation, delineating various troubleshooting and test procedures, hands-on experience with connectors, fasteners, troubleshooting and testing of electronic systems. Testing of integrated circuits and personal computer boards. Concepts reinforced through student projects. (1 lecture hour, 2 lab hours)
Prerequisite: ELECT 1100 with a grade of C or better or equivalent or consent of instructor.

ELECT 1141
Digital Fundamentals
3 Credit Hours
Introduction to basic concepts in digital electronics. Basic discrete electronics, digital logic, circuit laws, components, troubleshooting and use of test equipment. Hands-on experience, practical applications and projects. Teamwork, critical thinking and problem solving are emphasized. (2 lecture hours, 2 lab hours)

ELECT 1151
Electronic Devices and Applications
4 Credit Hours
Basic concepts in electronic devices. Topics include diode and transistor fundamentals and applications, operational amplifier circuits, measurement and control circuits troubleshooting, and use of test equipment. Hands-on experience, practical applications, and projects. Teamwork, critical thinking, and problem solving are emphasized. (2 lecture hours, 4 lab hours)
Prerequisite: ELECT 1100 or consent of instructor.

ELECT 1152
Electronic Devices and Applications 2
4 Credit Hours
A continuation of Electronic Devices and Applications I. Advanced concepts in electronic devices. Topics include diode and transistor applications, troubleshooting and use of test equipment. Hands-on experience, practical applications and projects. Teamwork, critical thinking and problem solving are emphasized. (2 lecture hours, 4 lab hours)
Prerequisite: ELECT 1151 with a grade of C or better or equivalent, or consent of instructor.

ELECT 1161
Modern Communications
3 Credit Hours
Introduces basic concepts in wireless telecommunication electronics and circuits. Covers fundamentals of analog, and digital communications, and modern wireless communication techniques. (2 lecture hours, 2 lab hours)

ELECT 1162
Electronic Communication 2
4 Credit Hours
A continuation of Electronic Communication 1. Advanced concepts in analog and digital communications and digital telecommunication circuits. Transmission lines, antennas, cell systems, networks, fiber-optics, troubleshooting and use of telecommunication test equipment. Hands-on experience, practical applications and projects. Teamwork, critical thinking and problem solving are emphasized. (2 lecture hours, 4 lab hours)
Prerequisite: ELECT 1161 or equivalent, or consent of instructor.

ELECT 1201
Renewable Energy Fundamentals
2 Credit Hours
Survey of renewable energy technology including wind turbines and solar photovoltaic (PV) power technology. (1 lecture hour, 3 lab hours)

ELECT 1221
Introduction to Biomedical Instrumentation Technology
3 Credit Hours
Introduction to operation and maintenance of biomedical equipment and instrumentation. Basic terminology, fundamental measurements, recording and monitoring of medical instrumentation will be covered. (2 lecture hours, 2 lab hours)
Prerequisite: ELECT 1100 with a grade of C or better, or equivalent is recommended.

ELECT 1820
Selected Topics I
1-4 Credit Hours
Introductory exploration and analysis of selected topics with a specific theme indicated by course title listed in college class schedule. This course may be taken four times for credit as long as different topics are selected. (1 to 3 lecture hours, 2 to 4 lab hours)

ELECT 1840
Independent Study
1-4 Credit Hours
Exploration and analysis of topics within the discipline to meet individual student-defined course description, goals, objectives, topical outline and methods of evaluation in coordination with and approved by the instructor. This course may be taken four times for credit as long as different topics are selected. (1 to 4 lecture hours)
Prerequisite: Consent of instructor is required.

ELECT 2001
Green Energy Systems
3 Credit Hours
Advanced study of principles of operation, testing, and diagnosis of green energy systems. These systems are evaluated both with discussion of theory, hands-on lab analysis and alternative energy systems feasibility study will be included of actual green energy systems. (2 lecture hours, 2 lab hours)
Prerequisite: ELECT 1100 with a grade of C or better, or equivalent or ELECT 1201 with a grade of C or better, or equivalent or consent of instructor.

ELECT 2112
Motor Control and Industrial Wiring
3 Credit Hours
Introduction to fundamental motor control concepts, basic control characteristics and review of control strategies. Hands-on experience, practical applications and projects. Teamwork, critical thinking and problem solving are emphasized. (2 lecture hours, 2 lab hours)
Prerequisite: ELECT 1100 or equivalent, or consent of instructor.

ELECT 2201
Applied Electronics
5 Credit Hours
A continuation of Electronic Devices and Applications II course. Advanced semiconductor circuits, linear and nonlinear op-amps, analog signal conditioning, and linear power supplies. Hands-on experience, practical applications and projects. Teamwork, critical thinking and problem solving are emphasized. (3 lecture hours, 4 lab hours)
Prerequisite: ELECT 1152 or equivalent, or consent of instructor.

ELECT 2215
Smart Grid Fundamentals
3 Credit Hours
Course covers fundamentals of smart grid technology including basic functions, design criteria, tools, techniques, and technology need for building a smart grid. Electric power systems, power and control system engineering, and power electronics are integrated into the study of modeling and control of smart grid renewal energy systems. (2 lecture hours, 2 lab hours)
Prerequisite: ELECT 1100, ELECT 1101, ELECT 1151, and ELECTC 1201, all with a grade of C or better, or equivalent or consent of instructor.

ELECT 2220
Electronic Instruments, Measurements, And Control
3 Credit Hours
Methods of measurements of basic electric and electronic parameters. Study of circuits and characteristics of major electronic instruments. Basic control circuits. (2 lecture hours, 2 lab hours)
Prerequisite: ELECT 1141 and ELECT 1151 or equivalent, or consent of instructor.

ELECT 2221
Biomedical Instrumentation Technology and Applications
3 Credit Hours
A continuation of the study of biomedical instrumentation. Students will learn how to inspect, repair, and maintain biomedical instrumentation and equipment. Internal electronic circuitry and typical clinical environments are discussed. (2 lecture hours, 2 lab hours)
Prerequisite: ELECT 1221 with a grade of C or better, or equivalent or consent of instructor.

ELECT 2241
Wireless Telecommunications 1
3 Credit Hours
Basic concepts in wireless electronics and circuits. Fundamentals of wireless telecommunication systems, frequency spectrum, cellular radio, troubleshooting, and use of telecommunication test equipment. Hands-on experience, practical applications and projects. Teamwork, critical thinking and problem solving are emphasized. (2 lecture hours, 2 lab hours)
Prerequisite: ELECT 1162 or consent of instructor.

ELECT 2245
Programmable Logic Devices
4 Credit Hours
Introduction to digital systems programming. Field Programmable Gate Arrays (FPGA) and Complex Programmable Logical Devices (CPLD) are used in this course to develop sample applications. These state-of-the-art devices are programmed using the Verilog and VHDL (Very High Density Programming Language) languages, popular in science and industry today. Hands-on experience, practical applications and projects. (2 lecture hours, 4 lab hours)
Prerequisite: ELECT 1141 or equivalent, or consent of instructor.

ELECT 2255
Industrial Controls
3 Credit Hours
Introduction of basic concepts in industrial electronics. Topics include an overview of transducers and signal conditioning. Troubleshooting and use of test equipment. Principles and fundamental laws of control technology and industrial electronics are included. (2 lecture hours, 2 lab hours)
Prerequisite: ELECT 1141 and ELECT 1151 or consent of instructor.

ELECT 2262
Introduction to Microprocessors
4 Credit Hours
Introduction to basic concepts in microprocessor systems. Architecture of microprocessor systems, and investigation of all phases of troubleshooting and implementation of reliable microprocessor systems. Hands-on experience, practical applications and projects. Teamwork, critical thinking and problem solving are emphasized. (2 lecture hours, 2 lab hours)
Prerequisite: ELECT 1101 and ELECT 1141 or equivalent, or consent of instructor.

ELECT 2273
Embedded Systems & Microcontroller Programming
3 Credit Hours
Introduction to embedded systems applications involving real-time programming of microcontrollers and digital to analog conversion. Hands-on experience includes programming Reduced Instruction Set Computing (RISC) microcontrollers, Field Programmable Gate Arrays (FPGA) circuits, and digital signal processing using Operation Amplifiers, Digital Signal Processing (DSP), and Phase Locked Loop (PLL) chips. (2 lecture hours, 2 lab hours)
Prerequisite: ELECT 1141 with a grade of C or better, or equivalent, or consent of instructor.

ELECT 2860
Internship (Career & Technical Ed)
1-4 Credit Hours
Course requires participation in Career and Technical Education work experience with onsite supervision. Internship learning objectives are developed by student and faculty member, with approval of employer, to provide appropriate work-based learning experiences. Credit is earned by working a minimum of 75 clock hours per semester credit hour, up to a maximum of four credits. (5 to 20 lab hours)
Prerequisite: Consent of instructor and 2.0 cumulative grade point average; 12 semester credits earned in a related field of study; students work with Career Services staff to obtain approval of the internship by the Dean from the academic discipline where the student is planning to earn credit.
Course types: Contemporary Life Skills (A.A., A.S., A.A.S., A.G.S.)

ELECT 2865
Internship Advanced (Career & Tech Ed)
1-4 Credit Hours
Continuation of Internship (Career and Technical Education). Course requires participation in Career & Technical Education work experience with onsite supervision. Internship learning objectives are developed by student and faculty member, with approval of employer, to provide appropriate work-based learning experiences. Credit is earned by working a minimum of 75 clock hours per semester credit hour, up to a maximum of four credits. (5 to 20 lab hours)
Prerequisite: Consent of instructor and 2.0 cumulative grade point average; 12 semester credits earned in a related field of study; students work with Career Services staff to obtain approval of the internship by the Dean from the academic discipline where the student is planning to earn credit.
Course types: Contemporary Life Skills (A.A., A.S., A.A.S., A.G.S.)