ELECTRONICS (ELEC)

ELEC 10 Introduction to Mechatronics
2 Units (Degree Applicable)
Lecture: 18  Lab: 54

A combination of conventional electronic technology with mechanical and computer technology. Special emphasis is on robotics. Hands-on activities include the building of a robot.

Course Schedule

ELEC 11 Technical Applications in Microcomputers
3 Units (Degree Applicable, CSU)
(May be taken for option of letter grade or Pass/No Pass)
Lecture: 36  Lab: 54

Personal computer (PC) applications used in electronics technology. Includes word processing, spreadsheets, database, computer presentation methods, and internet research specifically designed for electronics technology.

Course Schedule

ELEC 12 Computer Simulation and Troubleshooting
2 Units (Degree Applicable)
(May be taken for option of letter grade or Pass/No Pass)
Lecture: 18  Lab: 54
Advisory: ELEC 51 and ELEC 56 taken prior

Troubleshooting of electronic hardware, including use of computer-based tools for simulation and troubleshooting of analog and digital circuits. National Instruments Multisim software will be used for circuit analysis, value substitution, and fault diagnostics.

Course Schedule

ELEC 50A Electronic Circuits - Direct Current (DC)
4 Units (Degree Applicable, CSU)
(May be taken for option of letter grade or Pass/No Pass)
Lecture: 54  Lab: 54
Advisory: Eligibility for MATH 51

Direct Current (DC) electrical circuits and their applications. Covers DC sources, analysis, test equipment, measurements, and troubleshooting of resistive devices and other basic components. Includes Ohm’s Law, Kirchhoff’s law, and network theorems. (Students seeking a survey course in electronics should take ELEC 10, Introduction to Mechatronics, rather than ELEC 50A or 50B.)

Course Schedule

ELEC 50B Electronic Circuits (AC)
4 Units (Degree Applicable, CSU)
(May be taken for option of letter grade or Pass/No Pass)
Lecture: 54  Lab: 54
Advisory: ELEC 50A taken prior

Alternating Current (AC) electrical circuits and their applications. Covers AC sources, analysis (using complex numbers), test equipment, measurements, and troubleshooting of basic circuits with capacitors, inductors, and resistors. Includes impedance, resonance, filters, and decibels.

Course Schedule

ELEC 51 Semiconductor Devices and Circuits
4 Units (Degree Applicable, CSU)
(May be taken for option of letter grade or Pass/No Pass)
Lecture: 54  Lab: 54
Advisory: ELEC 50B

Solid-state devices and circuits, including bipolar-junction and field-effect transistors, rectifier diodes, operational amplifiers, and thyristors. Analog circuits studied include discrete and integrated circuit amplifiers, voltage regulators, oscillators and timers. Emphasizes configurations, classes, load lines, characteristic curves, gain, troubleshooting, measurements, and frequency response.

Course Schedule

ELEC 53 Communications Systems
4 Units (Degree Applicable)
Lecture: 54  Lab: 54
Advisory: ELEC 51 taken prior or concurrently

Analog and digital communications systems. Emphasizes analog and digital modulation principles, multiplexing, protocols, and telecommunications circuits and systems.

Course Schedule

ELEC 54A Industrial Electronics
4 Units (Degree Applicable, CSU)
Lecture: 54  Lab: 54
Advisory: ELEC 50A and ELEC 50B taken prior

Industrial electronic components and basic control circuits. Includes time delay controls, thyristor controls, relays, optoelectronic (opto) devices, direct current (DC) and alternating current (AC) motor control, transducers, silicon controlled rectifier (SCR) and unijunction transistor (UJT) devices.

Course Schedule

ELEC 54B Industrial Electronic Systems
3 Units (Degree Applicable, CSU)
(May be taken for option of letter grade or Pass/No Pass)
Lecture: 36  Lab: 54

Systems application of industrial electronics including industrial production and processes, automation, and programmable and motor controllers. Emphasis is on programmable logic controllers (PLCs).

Course Schedule

ELEC 55 Microwave Communications
4 Units (Degree Applicable)
Lecture: 54  Lab: 54
Advisory: ELEC 50B taken prior

Microwave components and circuits. Stresses transmission lines, Smith Charts, impedance matching, antenna characteristics, wave propagation, frequency analysis, and measurement techniques.

Course Schedule
ELEC 56  Digital Electronics  
4 Units (Degree Applicable, CSU)  
(May be taken for option of letter grade or Pass/No Pass)  
Lecture: 54  Lab: 54  

Combinational and sequential logic circuits emphasizing number systems, binary math, basic gates, Boolean algebra, Karnaugh maps, flip-flops, counters, and registers. Stresses design and troubleshooting techniques.  
Course Schedule

ELEC 61  Electronic Assembly and Fabrication  
3 Units (Degree Applicable, CSU)  
(May be taken for option of letter grade or Pass/No Pass)  
Lecture: 36  Lab: 54  
Advisory: ELEC 50A and ELEC 50B  

Manufacturing and fabrication processes associated with the electronics industry. Printed circuit board (PCB) design from conception to completion. Emphasizes electrical schematics, bill of material (BOM), component selection, layout design, manufacturability, assembly, soldering, de-soldering, and surface-mount technology.  
Course Schedule

ELEC 62  Advanced Surface Mount Assembly and Rework  
2 Units (Degree Applicable)  
Lecture: 18  Lab: 54  
Advisory: ELEC 61  

Advanced course in assembly and repair (soldering) on surface mount assemblies (SMT). Prepares for the Institute for Printed Circuits (IPC) surface mount assembly and rework certifications.  
Course Schedule

ELEC 74  Microcontroller Systems  
4 Units (Degree Applicable, CSU)  
(May be taken for option of letter grade or Pass/No Pass)  
Lecture: 54  Lab: 54  
Advisory: ELEC 56  

Microcontroller systems and programming methods; programmable logic devices (PLDs); serial communications; conversion of signals from analog to digital formats and the converse. Industry applications, interfacing, and troubleshooting.  
Course Schedule

ELEC 76  FCC General Radiotelephone Operator License Preparation  
2 Units (Degree Applicable)  
Lecture: 18  Lab: 54  
Advisory: ELEC 50B  

Prepares qualified electronics and aviation technicians for the Federal Communications Commission (FCC) commercial General Radiotelephone Operator License (GROL).  
Course Schedule

ELEC 81  Laboratory Studies in Electronics Technology  
1-2 Units (Degree Applicable)  
Lab: 54-108  
Advisory: ELEC 50B taken prior or concurrently  

Extended laboratory experience supplementary to that available in the regular program. Allows the student to pursue more advanced and complex laboratory projects and experiments.  
Course Schedule

ELEC 91  Work Experience in Electronics  
1-4 Units (Degree Applicable)  
(May be taken for Pass/No Pass only)  
Lab: 75-300  
Prerequisite: Compliance with Work Experience regulations as designated in the College Catalog  
Advisory: ELEC 56  

Provides on-the-job experience in electronics at an approved work site which is related to classroom instruction. A minimum of five hours per week of supervised work (60 non-paid clock hours or 75 paid clock hours per semester) is required for each one unit of credit.  
Course Schedule