ELECTRONIC TECHNOLOGY

School of Physical Sciences and Technologies

Dean: Kathleen Schrader, DNSc
Academic Chair: vacant
Faculty: Ray Chandos, Terry Schmidt, Jimmy Yu

Curriculum

The curriculum in electronic technology equips students with the skills necessary for coping with a rapidly expanding and changing technological field. A core curriculum seeks to identify and emphasize those principles which are basic to the understanding of current and emerging technologies. In advanced courses, students learn to apply available technology to the solution of specific problems, with an emphasis on creative design and troubleshooting. The curriculum emphasizes a practical rather than an abstract mathematical understanding of electronics, focusing heavily on laboratory study, while still maintaining a level of mathematical rigor appropriate to four-year programs in engineering technology.

Major

A student majoring in electronic technology may choose from a number of career paths.

The electronics aide certificate program equips the student for entry into the electronics industry in areas such as testing, quality assurance, customer support, production support, equipment maintenance and technical sales.

The electronic technology certificate program provides a solid foundation for immediate employment or further study in the field. After obtaining a certificate in electronic technology, a student may seek employment as an electronic technician, designing, testing and servicing telecommunication, medical, video, automotive, aerospace, and entertainment equipment.

Completion of the Associate in Science degree provides even broader opportunity for personal, academic, and career growth. A student may also transfer into the California State University system and complete a bachelor's degree in engineering technology.

Career Options

Examples of careers for the Electronic Technology major include the following:

- Bench (Repair) Technician
- Biomedical Instrument Technician
- Customer Support Technician
- Field Service Technician
- Research and Development Technician
- Test Technician

With a bachelor's degree:

- Design Engineer
- Electronic Engineering Technologist
- Field Support Engineer
- Manufacturing Engineer

Associate Degree

Associate in Science Degree in Electronic Technology

Students must complete a minimum of 60 units of credit, including the courses in the major ("Major Requirements") and general education requirements (pages 43-49), with an overall GPA of 2.0 or better, and a grade of "A," "B," "C," or "P" in all courses to be counted toward the major. A minimum of 12 units must be completed at Irvine Valley College. See pages 34-35 for further information.

Certificate Programs

Certificate of Achievement: Electronic Technology

Certificate of Proficiency: Electronics Aide

Students must complete all courses in the certificate program ("Major Requirements") with a grade of "A," "B," "C," or "P." A minimum of 12 units in the certificate program must be completed at Irvine Valley College. See page 31 for further information.

California Electrician Certification Training

Irvine Valley College is an approved provider of Electrician Training under Assembly Bill 1087. Irvine Valley College provides instruction in part of the Curriculum Standards adopted by the Electrician Certification Curriculum Committee (ECCC) but does not provide instruction in all of the Curriculum Standards. The Electrician Training curriculum offered by Irvine Valley College covers only the following Curriculum Standards adopted by the ECCC:

III. Math
IV. Electrical Theory

Transfer Preparation

Courses that fulfill major requirements for an associate degree at Irvine Valley College may not be the same as those required for completing the major at a transfer institution offering a bachelor's degree. Students who plan to transfer to a four-year college or university should schedule an appointment with an IVC counselor to develop a plan of study before beginning their program. It may be helpful to meet with the department faculty at IVC.

ASSOCIATE IN SCIENCE DEGREE OR CERTIFICATE OF ACHIEVEMENT

Major Requirements: Electronic Technology

Complete the following courses:		Units
ET 102	Basic Electric Circuits I	4
ET 104	Basic Electric Circuits II	4
ET 105	Electronic Devices and Circuits I	4
ET 107	Electronic Devices and Circuits II	4
ET 109	Digital Electronic Circuits	4
Complete one of the following courses:		
ET 116	Industrial Electronics	4
ET 120	Introduction to Microprocessors	4
Complete one of the following courses:		
CS 36	C Programming	4
CS 40A	Computer Organization and Assembly Language I	4
CS 40B	Computer Organization and Assembly Language II	4
	TOTAL UNITS:	**28**

Recommended electives:
ET 101, PHYS 20

CERTIFICATE OF PROFICIENCY

Electronics Aide

Complete the following courses:		Units
ET 102	Basic Electric Circuits I	4
ET 104	Basic Electric Circuits II	4
ET 105	Electronic Devices and Circuits I	4
ET 109	Digital Electronic Circuits	4
	TOTAL UNITS:	**16**

Recommended Electives:
ET 101

COURSES

CWE 168: COOPERATIVE WORK EXPERIENCE: ELECTRONIC TECHNOLOGY

1–4 Units
1–4 hours lecture
Transfers: CSU
Prerequisite: Student must have taken or must be currently taking a course in college-level electronic technology.
Limitation: Students must be concurrently enrolled in 7 units, including CWE. Application must be approved by CWE coordinator.
This course provides students an opportunity for supervised work experience. Students extend their classroom-based occupational learning by working at a job related to their major and to their occupational goal. Student, instructor, and employer will cooperatively develop a minimum of three learning objectives. One unit of credit will be awarded for each 75 hours of paid or 60 hours of volunteer employment for successful completion of learning objectives, and for attendance at scheduled seminar sessions. A maximum of four units may be applied toward major requirements or a certificate. R-I-3

ET 101: ELECTRONICS IN EVERYDAY LIFE

3 Units
2.5 hours lecture, 1.5 hours lab
Transfers: CSU
This course provides an introduction to the field of electronics. The course studies basic electronic principles, components and terminology and their practical application in such areas as radio, television, computer, household and automotive electronics. NR

ET 102: BASIC ELECTRIC CIRCUITS I

4 Units
3 hours lecture, 3 hours lab
Transfers: CSU
This introductory course, the first course in the Electronic Technology sequence, studies the basic concepts of electricity and their practical applications. The course focuses on basic two-terminal passive devices, direct current and transient circuits, plus standard laboratory test equipment and procedures. Students analyze, test, design and troubleshoot specific devices and circuits, including batteries, resistors, capacitors and inductors connected in series, parallel, and series-parallel circuits. NR

ET 104: BASIC ELECTRIC CIRCUITS II
4 Units
3 hours lecture, 3 hours lab
Transfers: CSU
Prerequisite: ET 102
This second course in the Electronic Technology sequence covers the principles and applications of AC circuits, including reactance, impedance, resonance, residential wiring and lighting, filters, spectrum analysis, audio, telephone, and radio. Students analyze, test, design and troubleshoot the devices and circuits studied. NR

ET 105: ELECTRONIC DEVICES AND CIRCUITS I
4 Units
3 hours lecture, 3 hours lab
Transfers: CSU
Prerequisite: ET 102
This course studies basic solid-state devices and their application circuits. Students test devices such as diodes, LEDs, transistors and thyristors and measure their characteristics.The course covers the analysis, troubleshooting, and design of solid-state application circuits, including rectifiers, switching circuits, and amplifiers. NR

ET 107: ELECTRONIC DEVICES AND CIRCUITS II
4 Units
3 hours lecture, 3 hours lab
Transfers: CSU
Prerequisite: ET 105
This course continues the study of solid-state devices and their application circuits begun in Electronic Technology 105. Students test and measure the characteristics of such devices as field effect transistors (FETs), operational amplifiers (op amps), linear integrated circuits, active filters, analog switches, opto-electronics, and fiber optics. They also analyze, design, and troubleshoot application circuits, including amplifiers, power supplies, voltage regulators, and oscillators. NR

ET 109: DIGITAL ELECTRONIC CIRCUITS
4 Units
3 hours lecture, 3 hours lab
Transfers: CSU
Prerequisite: ET 102
Corequisite: Concurrent enrollment in or prior completion of ET 105
This course introduces the fundamental concepts of digital electronics, including binary numbers, truth tables, logic families, and Boolean algebra. Students test, troubleshoot, analyze, and design digital circuits including gate networks, flip-flops, astables; monostables, registers, counters, memories, digital-to-analog (D/A) and analog-to-digital (A/D) converters, phase-locked loops, tri-state logic, and data communication circuits. NR

ET 116: INDUSTRIAL ELECTRONICS
4 Units
3 hours lecture, 3 hours lab
Transfers: CSU
Prerequisite: ET 109
This course deals with the application of electronics to industrial monitoring and control. It introduces the basic functional blocks used in industrial systems, including sensors, actuators, controllers, and signal processors. The course covers how to monitor and control industrial processes using a microcomputer or a programmable logic controller (PLC), and how to test, troubleshoot, analyze, and design commonly used industrial circuits and systems. Topics include digital and relay logic, time delay, motors, triacs, robotics, closed-loop control, and remote control. NR

ET 119: INDUSTRIAL AUTOMATION USING PLCS
2 Units
1.5 hours lecture, 1.5 hours lab
Transfers: CSU
This course introduces the PLC, or programmable logic controller, a small, specialized computer used to control and monitor industrial processes. Students gain hands-on experience in both connecting the PLC to external equipment and programming it using ladder diagrams. Topics covered include relay ladder logic, latching, timing, counting, sequential control, sensors, and actuators. NR

ET 120: INTRODUCTION TO MICROPROCESSORS AND MICROCONTROLLERS
4 Units
3 hours lecture, 3 hours lab
Transfers: CSU
Prerequisite: ET 109
This course introduces the microprocessor and microcontroller. Topics include tri-state busses, memory, input/output (I/O) ports, address decoding, assembly and machine language programming, addressing modes, logical and mathematical operations, branching, loops, subroutines, interfacing, interrupts, and troubleshooting techniques. Students design the hardware, software, and interfacing circuitry to provide a microprocessor- or microcontroller-based function, or a complete system. NR

ET 201: RESIDENTIAL WIRING
4 Units
3 hours lecture, 3 hours lab
Recommended Preparation: ET 102, ET 104
This course provides practical instruction for wiring homes according to National Electrical Code (NEC) rules, covering all code requirements and construction practices for installing electrical systems in one- and two-family dwellings. Through classroom and laboratory instruction, the course covers planning, service equipment, wiring methods, lighting, and the special requirements for kitchens, bathrooms, and other residential living spaces. Outdoor installations are also covered, as well as swimming pools, spas, heating, ventilation, and air conditioning (HVAC) equipment, and remodeling (old work). Safety requirements and procedures are emphasized throughout. NR

ET 203: COMMERCIAL AND INDUSTRIAL WIRING
4 Units
3 hours lecture, 3 hours lab
Recommended Preparation: ET 102, ET 104, ET 201
This course provides practical instruction for wiring commercial buildings according to National Electrical code (NEC) rules, covering all code requirements and construction practices for installing electrical systems in commercial facilities. Through classroom and laboratory instruction, the course covers planning, working drawings, service equipment, wiring methods, branch and feeder circuits, overcurrent protection, motor and appliance circuits, and lighting, as well as heating, ventilation, and air conditioning (HVAC) equipment. Safety requirements and procedures are emphasized throughout. NR