

Electronics

Trade & Technical Division

Electronic/Computer Servicing Technology

Program Description

Designed to prepare the student for employment in industry by providing an extensive background in electronics theory with laboratory application. Employment would be at the level of entry-level technologist/technician or engineering assistant.

Certificate of Achievement and Associate in Science Degree

A Certificate of Achievement can be obtained by completing the 40-unit major. The Associate in Science Degree can be obtained by completing a total of 61 units, including the 40-unit major and the general education requirements. This program may be completed by taking Extended Day classes but will require more semesters to complete than the day program.

Required Courses

NOTE: Not all courses are offered every semester, and the sequence of courses listed below is recommended, not required.

	Units	Recommended Electives
ECTRN 50—DC Electronic Principles	4	CIS 1, 55, 58,
ECTRN 51—AC Electronic Principles	4	DRAFT 50
ECTRN 52—Semiconductor Devices	4	ECTRN 102,111,112, 113, 150, 151, 171, 173
ECTRN 53—Comm/Operational Amplifiers	4	ENGL 51
ECTRN 60—Digital Fundamentals	4	IT 140
ECTRN 61—Digital Systems	4	OCCED 90, 91
ECTRN 126—Microprocessors/Microcomputers	4	Advanced standing may be granted for ECTRN 50 and/or 51 or ECTRN 60 by achieving a satisfactory score on a written test. The test may not be retaken.
ECTRN 128—Computer Servicing	4	
ECTRN 140—Math for Electronics	4	
ECTRN 141—Math for Electronics	4	
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		Students may substitute:
		ECTRN 132 and 133 for ECTRN 140
		ECTRN 134 and 135 for ECTRN 141

Job-Direct Certificate Requirements

For each of the following programs, the required courses must be completed with a grade of "C" or better.

Computer Investigations

Required Courses

	Units
CIS 1—Introduction to Computers	3
CRIMJ 1 —Introduction to Criminal Justice	3
CRIMJ 51 —Criminal Investigation	3
ECTRN 173 —Computer Forensics Investigations	4
	13

Electronic Security and Surveillance Technician

Required Courses

	Units
CRIMJ 1 —Introduction to Criminal Justice	3
ECTRN 111 —Fundamentals of Wire & Cabling	1
ECTRN 112—Fundamentals of Fiber Optics	1
ECTRN 113 —Fund. of Wireless Communication	1
ECTRN 171 —Security and Surveillance Techniques	4
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Computer Servicing Technician

Required Courses

	Units
CIS 1—Introduction to Computers	3
ECTRN 126 —Microprocessors & Microcomputers	4
ECTRN 128 —Computer Servicing	4
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Home Technology Integrator

Required Courses

	Units
IT 160—Electrical Fundamentals	3
ECTRN 111—Fund. of Wire & Cabling	1
ECTRN 112—Fund. of Fiber Optics	1
ECTRN 113—Fund. of Wireless Communication	1
ECTRN 175—Home Technology Integration Techniques	4
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ECTRN 50 DC Electronic Principles <i>Prerequisites: ECTRN 132 or ECTRN 140 (either may be taken concurrently). Course Advisory: SCC minimum English standard. Presents the principles of direct current and passive devices, and introduces active devices. Mathematical analysis and laboratory construction of circuits are required. Three hours lecture, three hours lab.</i>	4 Units	ECTRN 101 Introduction to Electricity and Electronics <i>Prerequisite: None. NOTE: Not open for credit to students who have taken ECTRN 50 or 51. Course Advisories: SCC minimum math and English standards. An introductory study of electrical and electronic technology. Fundamentals of DC and AC circuitry components. Instruments used in the study of basic electronics will be discussed and demonstrated with an emphasis on interpretation of schematic diagrams, breadboarding, and familiarization of electronic components. Two hours lecture, three hours lab.</i>	3 Units
ECTRN 51 AC Electronic Principles <i>Prerequisite: ECTRN 50 and ECTRN 133 or ECTRN 140 (all may be taken concurrently). Presents the principles of alternating current circuits and active devices. Mathematical analysis and laboratory construction of circuits are required. Three hours lecture, three hours lab.</i>	4 Units	ECTRN 102 Electrical Safety <i>Course Advisories: SCC minimum math and English standards. A survey of the proper use, handling, and hazards associated with electrical and electronic equipment. The student will be introduced to the current generally accepted (National Electrical Safety Code) safety practices and procedures associated with power transmission, industrial, and consumer electrical and electronic equipment. Repeatable 2 times. Sixteen hours lecture (1 week course).</i>	1 Unit
ECTRN 52 Semiconductor Devices and Circuits <i>Prerequisites: ECTRN 51 and ECTRN 134 or ECTRN 141 (ECTRN 134 or 141 may be taken concurrently). Course Advisory: SCC minimum English standard. Presents the principles of discrete semiconductor devices and circuits. Mathematical analysis and laboratory constructions of circuits required. Three hours lecture, three hours lab.</i>	4 Units	ECTRN 111 Fundamentals of Wire and Cabling <i>Course Advisories: SCC minimum English and math standards. Presents the principles and practices of copper cable wiring technology. Includes instruction in the design, installation, and maintenance of copper wiring systems for intelligent control systems, lighting and appliance control devices, communication and networking. Also includes instruction in household and institutional power wiring. One hour lecture, one hour lab.</i>	1 Unit
ECTRN 53 Communications and Operational Amplifiers <i>Prerequisite: ECTRN 52 and ECTRN 135 or ECTRN 141 (ECTRN 135 or 141 may be taken concurrently). Course Advisories: SCC minimum English and math standards. Presents the principles of operational amplifier circuits, discrete and integrated communications circuits, and AM/FM transmitters and receivers. Mathematical analysis and laboratory construction are required. Three hours lecture, three hours lab.</i>	4 Units	ECTRN 112 (formerly ECTRN 105) Fundamentals of Fiber Optics <i>Course Advisories: SCC minimum English and math standards. Presents the principles and practices of fiber optics and optoelectronic technology. Includes instruction in the design, installation, and maintenance of fiber optic cabling and control systems and optoelectronic control systems for computer communication and networking systems. One hour lecture, one hour lab.</i>	1 Unit
ECTRN 60 Basic Digital Fundamentals <i>Course Advisory: SCC minimum English standard. Presents the principles of digital numbering systems, digital codes, logic gates, and flip-flops; an introductory course in Boolean Algebra and digital electronics. Mathematical analysis and laboratory assignments are required. Three hours lecture, three hours lab.</i>	4 Units		
ECTRN 61 Digital Systems: Principles and Applications <i>Prerequisite: ECTRN 60 (may be taken concurrently). Course Advisory: SCC minimum English standard. Presents the principles of counter circuits, registers, memories, arithmetic logic, integrated circuits, and digital computer introduction. Mathematical analysis and laboratory assignments are required. Three hours lecture, three hours lab.</i>	4 Units		

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ECTRN 113 Fundamentals of Wireless Communication <i>Course Advisories: SCC minimum English and math standards. Presents the principles and practices of wireless communication technology. Includes instruction in the design, installation, and maintenance of wireless communication and network systems. Emphasis is placed on system reliability, security, and cost containment concerns. One hour lecture, one hour lab.</i>	1 Unit	ECTRN 134 Mathematics for Electronics <i>Prerequisite: ECTRN 133 with a grade of "C" or better. NOTE: Not open to students who have completed ECTRN 141. Presents the principles of trigonometry as it applies to electronics. Frequent homework assignments and written tests are required. Four hours lecture. (8 week course.)</i>	2 Units
ECTRN 126 Microprocessors and Microcomputers <i>Course Advisories: ECTRN 61, SCC minimum English standard. Presents the principles of an introductory course that concentrates on microcomputer hardware and software. Digital circuits, I/O modes, interfacing, microprocessors and microcomputer structure, operation, and programming. Mathematical analysis and laboratory assignments are required. Three hours lecture, three hours lab.</i>	4 Units	ECTRN 135 Mathematics for Electronics <i>Prerequisite: ECTRN 134. NOTE: Not open to students who have completed ECTRN 141. Presents the principles of number systems and Boolean Algebra as they apply to electronics. Frequent homework assignments and written tests are required. Four hours lecture. (8 week course.)</i>	2 Units
ECTRN 127 Assembly Techniques <i>Course Advisories: ECTRN 51; SCC minimum English standard. Presents the principles of soldering, printed circuit board construction and assembly techniques. Laboratory constructions are required. One hour lecture, one and one-half hour lab.</i>	1 Unit	ECTRN 140 Mathematics for Electronics <i>Prerequisite: None. NOTE: Not open to students who have completed ECTRN 132 & 133. Course Advisories: SCC minimum English and math standards. Presents the principles of algebra, graphs and determinants as they apply to electronics. Frequent homework assignments and written tests required. Four hours lecture.</i>	4 Units
ECTRN 128 Computer Servicing <i>Course Advisories: ECTRN 126, SCC minimum English standard. Presents the purpose and capabilities of operating systems, system components and peripheral devices. The course emphasized initial investigation of a computer system, methods for isolation of troubles and procedures for completing the repair. Three hours lecture, three hours lab.</i>	4 Units	ECTRN 141 Mathematics for Electronics <i>Prerequisite: ECTRN 140 with a grade of "C" or better. NOTE: Not open to students who have completed ECTRN 134 & 135. Presents the principles of trigonometry, vectors, and number systems as they apply to electronics. Frequent homework assignments and written tests are required. Four hours lecture.</i>	4 Units
ECTRN 132 Mathematics for Electronics <i>Prerequisite: None. NOTE: Not open to students who have completed ECTRN 140. Course Advisory: SCC minimum English standard. Presents the principles of algebra as it applies to electronics. Frequent homework assignments and written tests are required. Four hours lecture. (8 week course.)</i>	2 Units	ECTRN 150 Electronic Troubleshooting <i>Prerequisite: ECTRN 52 with a grade of "C" or better. Provides computer aided troubleshooting practice in Analog and Digital circuits and systems. Mathematical analysis and laboratory constructions are required. Two hours lab.</i>	.5 Unit
ECTRN 133 Mathematics for Electronics <i>Prerequisite: ECTRN 132. NOTE: Not open to students who have completed ECTRN 140. Presents the principles of algebra, graphs and determinants as they apply to electronics. Frequent homework assignments and written tests are required. Four hours lecture. (8 week course.)</i>	2 Units	ECTRN 151 Oscilloscope Skill Development <i>Prerequisite: ECTRN 51. Course Advisories: SCC minimum English and math standards. Presents the principles of operation and use of oscilloscopes. Includes description and application of various operational modes and trigger selection with emphasis on dual trace, Tektronix oscilloscopes. Laboratory construction of circuits is required. Repeatable 1 time. One hour lecture, one hour lab.</i>	1 Unit

ECTRN 158	1.5 Units	ECTRN 212	1 Unit
Microcomputer Maintenance <i>Course Advisory: SCC minimum English standard. Presents data on component parts of computer systems, personal computer configuration for memory expansions, and input/output ports, and proper insertion/removal procedures for circuit boards and components. Three hours lecture, one hour lab. (8 week course.)</i>		FCC License Preparation <i>Course Advisories: ECTRN 53, SCC minimum English standard. Computer-aided instruction and laboratory study of Elements I, II, III of the FCC License for Commercial Radio Operators. This is a credit/no credit only course. Repeatable 2 times. Three hours lab.</i>	
ECTRN 171	4 Units	ECTRN 213	1 Unit
Security and Surveillance Techniques <i>Prerequisite: CRIMJ 1; ECTRN 111; ECTRN 112; ECTRN 113. Course Advisory: SCC minimum English and math standards. An overview of the principles and practices of the security and surveillance industry. Students are introduced to the modern methods used to secure physical property through electronic means. Students are introduced to the modern methods of gathering surveillance information through both covert and overt electronic means. Emphasis is placed on legal and ethical practices. Three hours lecture, three hours lab.</i>		FCC License Preparation <i>Course Advisories: ECTRN 53, SCC minimum English standard. Computer-aided instruction and laboratory study of Element IV of the FCC License for Commercial Radio Operators. This is a credit/no credit only course. Repeatable 2 times. Three hours lab.</i>	
ECTRN 173	4 Units		
Security and Surveillance Techniques <i>Prerequisite: CIS 1 and CRIMJ 51 (CRIMJ 51 may be taken concurrently). Course Advisory: Eligibility for ENGL 1; SCC minimum math standard. NOTE: Not available to students with felony convictions or certain drug and alcohol related convictions. Introduces the student to the physical aspects of data collection from computer systems. The student is introduced to the interpretation and analysis of recovered data for the purpose of collecting legal evidence. Student is exposed to data in an array of formats and applications from several computer types and operating systems as well as deleted, encrypted, and damaged information. Evidence reporting practices are also introduced. Prepares the student for HTCIA certification. Three hours lecture, three hours lab.</i>			
ECTRN 175	4 Units		
Home Technology Integration Techniques <i>Prerequisite: CIS 1; ECTRN 111; ECTRN 112; ECTRN 113; IT 160 or ECTRN 101 or ECTRN 51, all with grades of "C" or better. (ECTRN 51 & 101 are substitutes for IT 160 only). Course Advisory: SCC minimum English and math standards. Presents the principles and practices of installing and maintainin home technology. Student is exposed to home lighting controls, computer networking, home security, home entertainment systems including video, data, and voice, heating ventilation and air conditioning control systems, and home systems integration. Prepares the student for HTI+ certification. Three hours lecture, three hours lab.</i>			