

Electronics Technology ET

Degrees:

- A.S. – Automated Systems Technician
- A.S. – Electronics Facilities Maintenance Technician
- A.S. – Microcomputer Technician
- A.S. – Telecommunications Technician

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Certificates of Achievement:

- Automated Systems Technician
- Electronics Facilities Maintenance Technician
- Microcomputer Technician
- Telecommunications Technician
- Electronics Mechanic

Automated Systems Technician

Associate in Science Degree

Certificate of Achievement

Program Information

The Automated Systems Technician Program consists of courses from basic electronic concepts and safety to courses in computer and smart device controlled systems. It is designed to prepare students for employment in the automated manufacture, assembly, and testing of electronic circuit devices.

Recommended High School Preparation

Courses in electricity, electronics, English, algebra, physics, chemistry and computers.

Program Costs

In addition to the normal student expenses (for textbooks, personal equipment, and supplies), laboratory materials fees may be required. Students will be responsible for providing some electronic parts and purchasing a basic electronics tool kit, which is available from the College Store. For specific class-required materials and texts, check with the electronics faculty or the College Store. These fees may vary each semester. If these fees create a financial burden, students should consult the Financial Aid Office for possible assistance.

Career Opportunities

This program is designed for students pursuing employment in the programming, testing, repair, and maintenance of digital and analog computer controlled systems.

Gainful Employment

For more information about program costs, graduation rates, median debt of program graduates, and other important information regarding gainful employment, please visit: <http://www.losrios.edu/gainful-emp-info/gedt.php?major=051100C01>

Upon completion of this program, the student will be able to:

- demonstrate safe work practices for automated systems equipment.
- demonstrate the proper use of basic test equipment to include digital multimeters, oscilloscopes, and digital or analog signal sources.
- use a standard schematic diagram of an automated system to identify its digital or analog parts.
- explain common automated systems terminology for digital and analog devices.
- estimate automated system circuit performance using mathematical tools.
- analyze and compare calculated automated system circuit performance to actual performance.
- measure common automated system parameters using appropriate test equipment.
- set up and install basic automated system equipment.
- design proper preventive maintenance, calibration, and system testing procedures for automated equipment.
- perform proper preventive maintenance, calibration, and system testing on automated equipment.

- diagnose common automated system failures down to the source of the problem.
- solve automated system problems by replacing failed hardware or software parts.

Required Program

	Units
CISC 310 Introduction to Computer Information Science.....	3
ET 305 DC/AC Theory and Circuit Fundamentals.....	4
ET 306 Electronics Fabrication and Soldering Techniques.....	2
ET 314 Mathematics for DC/AC Theory and Circuit Fundamentals	3
ET 315 Mathematics for Semiconductor Theory.....	3
ET 322 Semiconductors and Nanotechnology.....	4
ET 335 Integrated Circuits with Computer Applications	4
ET 340 Basic Microprocessors	4
ET 360 Electronic Servicing and Calibration Techniques	3
ET 390 Microprocessor Systems – Troubleshooting.....	3
ET 400 Microwave Communications Techniques	4
ET 491 Electronics Projects Laboratory I.....	2
ET 492 Electronics Projects Laboratory II.....	2

Total Units Required

41

Associate in Science (A.S.) Degree

The Associate in Science Degree may be obtained by completion of requirements in the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See SCC graduation requirements.

Certificate of Achievement

The Certificate of Achievement may be obtained by completion of all courses in the required program with grades of “C” or better.

Electronics Facilities Maintenance Technician

Associate in Science Degree

Certificate of Achievement

Program Information

The Electronic Facilities Maintenance Technician Program consists of courses from basic electronic concepts and safety to courses in power distribution and facilities controls. It is designed to prepare students for employment in the transportation and power industries.

Recommended High School Preparation

Courses in electricity, electronics, English, algebra, physics, chemistry and computers.

Program Costs

In addition to the normal student expenses (for textbooks, personal equipment, and supplies), laboratory materials fees may be required. Students will be responsible for providing some electronic parts and purchasing a basic electronics tool kit, which is available from the College Store. For specific class-required materials and texts, check with the electronics faculty or the College Store. These fees may vary each semester. If these fees create a financial burden, students should consult the Financial Aid Office for possible assistance.

Career Opportunities

This program is designed for students pursuing internships and employment in the Federal Aviation Administration and other related industries in the areas of computer systems, environmental systems, communication equipment, and navigation equipment maintenance and repair.

Gainful Employment

For more information about program costs, graduation rates, median debt of program graduates, and other important information regarding gainful employment, please visit: <http://www.losrios.edu/gainful-emp-info/gedt.php?major=051288C01>

Upon completion of this program, the student will be able to:

- demonstrate safe work practices for electronic facilities equipment.
- demonstrate the proper use of electronic test equipment to include digital multimeters, oscilloscopes, signal sources, and supplies.
- use a standard schematic diagram of an electronic system to identify and test its parts.
- explain common electronic facilities systems terminology.
- estimate electronic facilities circuit performance using mathematical tools.
- analyze and compare calculated electronic facilities circuit performance to actual performance.
- measure common electronic facilities circuit parameters using appropriate test equipment.
- set up and install basic electronic facilities system equipment.
- design proper preventive maintenance, calibration, and system testing procedures for facilities equipment.
- perform proper preventive maintenance, calibration, and system testing on electronic facilities equipment.
- diagnose common electronic system failures down to the source of the problem.
- solve electronic system problems by replacing failed hardware or software parts.

Required Program

	Units
ET 305 DC/AC Theory and Circuit Fundamentals.....	4
ET 306 Electronics Fabrication and Soldering Techniques.....	2
ET 314 Mathematics for DC/AC Theory and Circuit Fundamentals	3
ET 315 Mathematics for Semiconductor Theory.....	3
ET 322 Semiconductors and Nanotechnology.....	4
ET 335 Integrated Circuits with Computer Applications.....	4
ET 340 Basic Microprocessors	4
ET 350 Receiver Circuits.....	5
ET 390 Microprocessor Systems – Troubleshooting.....	3
ET 400 Microwave Communications Techniques	4
ET 410 Transmitter Fundamentals.....	5
MATH 335 Trigonometry with College Algebra (5)	5

Total Units Required **46**

Suggested Electives

CISC 310, EDT 310, 352

Associate in Science (A.S.) Degree

The Associate in Science Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See SCC graduation requirements.

Certificate of Achievement

The Certificate of Achievement may be obtained by completion of the required program with grades of “C” or better.

Electronics Mechanic**Certificate of Achievement****Program Information**

The Electronic Mechanic Program consists of courses from basic electronic concepts and safety to courses in the introduction of semiconductor devices. It is designed to prepare students for entry level employment positions such as an electronic technicians apprentice.

Career Opportunities

This program is designed for students pursuing employment in the assembly and testing of electronic circuit devices.

Gainful Employment

For more information about program costs, graduation rates, median debt of program graduates, and other important information regarding gainful employment, please visit: <http://www.losrios.edu/gainful-emp-info/gedt.php?major=051104C01>

Program Costs

In addition to the normal student expenses (for textbooks, personal equipment and supplies), laboratory materials fees may be required. Students will be responsible for providing some of their own parts and a basic Electronics tool kit. These will be available as ready-made sets in the College Store. For specific class required materials and texts, check with the Electronics faculty or the College Store. These fees may vary each semester. If these fees create a financial burden, students should consult the Financial Aid Office for possible assistance.

Recommended High School Preparation

Courses in electricity, electronics, English, algebra, physics, chemistry, and computers

Upon completion of this program, the student will be able to:

- demonstrate safe work practices for electronic equipment.
- demonstrate the proper use of basic electronic test equipment to include digital multimeters, oscilloscopes, and power sources.
- use a standard schematic diagram of electronic devices to identify and assemble the component parts.
- explain common electronic circuit terminology.
- estimate electronic circuit performance using mathematical tools.
- analyze and compare calculated electronic circuit performance to actual performance.
- measure common electronic circuit parameters.
- implement performance testing on simple electronic devices.

Required Program

	Units
ET 305 DC/AC Theory and Circuit Fundamentals.....	4
ET 306 Electronics Fabrication and Soldering Techniques.....	2
ET 314 Mathematics for DC/AC Theory and Circuit Fundamentals	3
ET 315 Mathematics for Semiconductor Theory.....	3
ET 322 Semiconductors and Nanotechnology.....	4

A minimum of 13 units from the following: 13

CISC 310 Introduction to Computer Information Science (3)

ET 491 Electronics Projects Laboratory I (2)

ET 492 Electronics Projects Laboratory II (2)

ET 494 Topics in Electronics Technology (0.5 – 4)

ET 495 Independent Studies in Electronics Technology (1 – 3)

MET 256 Fundamentals of Instruments and Electricity (1.5)

MET 257 Fundamentals of Workplace Success (1.5)

MET 351 Basic Mechanical Systems (5)

MET 352 Mechanical Systems Calculations (3)

Total Units Required **29**

Certificate of Achievement

The Certificate of Achievement may be obtained by completion of the required program with grades of “C” or better or equivalent.

Microcomputer Technician**Associate in Science Degree****Certificate of Achievement****Program Information**

The Microcomputer Technician Program is designed to prepare students for entry level employment as technicians in the repair, installation, and maintenance of individual computers and network systems.

Career Opportunities

This program is designed for Electronics Technology students pursuing employment in the area of programming and maintaining microcomputer systems.

Gainful Employment

For more information about program costs, graduation rates, median debt of program graduates, and other important information regarding gainful employment, please visit: <http://www.losrios.edu/gainful-emp-info/gedt.php?major=051263C01>

Program Costs

In addition to the normal student expenses (for textbooks, personal equipment and supplies), laboratory materials fees may be required. Students will be responsible for providing some of their own parts and a basic Electronics tool kit. These will be available as ready-made sets in the College Store. For specific class required-materials and texts, check with the Electronics faculty or the College Store. These fees may vary each semester. If these fees create a financial burden, students should consult the Financial Aid Office for possible assistance.

Recommended High School Preparation

Courses in electricity, electronics, English, algebra, physics, chemistry and computers.

Upon completion of this program, the student will be able to:

- use the operating system on a personal computer to manipulate files and folders.
- use the operating system on a personal computer to configure hardware and applications.
- explain common computer terminology used in computer information science and electronics technology.
- diagnose common computer errors that occur because of hardware, software, or network problems.
- predict common computer error solutions in hardware, software, or network systems.
- resolve common computer errors that occur in hardware, software, or network systems.

Required Program

	Units
CISA 315 Introduction to Electronic Spreadsheets (2)	2
or CISA 316 Intermediate Electronic Spreadsheets (2)	
CISA 323 Database Management using Microsoft Access	2
CISC 310 Introduction to Computer Information Science.....	3
CISC 320 Operating Systems (1)	1
or CISC 323 Linux Operating System (1)	
CISC 355 Introduction to Data Communications (1.5)	1.5 – 3
or CISN 300 Network Systems Administration (3)	
or CISN 303 Network Administration – Linux Server (3)	
CISC 360 Information & Communication Technology Essentials (A+)	
(4) 4	
or ET 140 Smart Computing Device System Repair I (4)	
CISP 301 Algorithm Design and Implementation.....	4
ET 340 Basic Microprocessors	4
ET 390 Microprocessor Systems – Troubleshooting.....	3
ET 491 Electronics Projects Laboratory I (2)	2
or ET 492 Electronics Projects Laboratory II (2)	
A minimum of 4 units from the following:	4
CISC 351 Introduction to Local Area Networks (1)	
CISN 300 Network Systems Administration (3)	
CISN 303 Network Administration – Linux Server (3)	
CISN 304 Networking Technologies (3)	
EDT 310 Computer Aided Drafting (3)	
EDT 352 Electrical Design Documents (3)	
ET 305 DC/AC Theory and Circuit Fundamentals (4)	
ET 306 Electronics Fabrication and Soldering Techniques (2)	
ET 314 Mathematics for DC/AC Theory and Circuit	
Fundamentals (3)	
ET 322 Semiconductors and Nanotechnology (4)	

Total Units Required**30.5 – 32****Associate in Science (A.S.) Degree**

The Associate in Science Degree may be obtained by completion the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See SCC graduation requirements.

Certificate of Achievement

The Certificate of Achievement may be obtained by completion of all courses in the required program with grades of “C” or better in all courses or equivalent.

Telecommunications Technician**Associate in Science Degree****Certificate of Achievement****Program Information**

The Telecommunications Technician Program consists of courses from basic electronic concepts and safety to courses in computerized receiver and transmitter systems. It is designed to prepare students for employment as technicians in the wired and wireless communication of electronic information.

Career Opportunities

This program is designed for students pursuing employment in the calibration, testing, repair, and maintenance of electronic communications equipment.

Gainful Employment

For more information about program costs, graduation rates, median debt of program graduates, and other important information regarding gainful employment, please visit: <http://www.losrios.edu/gainful-emp-info/gedt.php?major=051106C01>

Program Costs

In addition to the normal student expenses (for textbooks, personal equipment and supplies), laboratory materials fees may be required. Students will be responsible for providing some of their own parts and a basic Electronics tool kit. These will be available as ready-made sets in the College Store. For specific class required materials and texts, check with the Electronics faculty or the College Store. These fees may vary each semester. If these fees create a financial burden, students should consult the Financial Aid Office for possible assistance.

Recommended High School Preparation

Courses in electricity, electronics, English, algebra, physics, chemistry, and computers.

Upon completion of this program, the student will be able to:

- demonstrate safe work practices for telecommunication equipment.
- demonstrate the proper use of basic telecommunication test equipment to include digital multimeters, oscilloscopes, signal sources.
- use a standard schematic diagram of a telecommunication system to identify and test its parts.
- explain common telecommunication terminology.
- estimate telecommunication system circuit performance using mathematical tools.
- analyze and compare calculated telecommunication system circuit performance to actual performance.
- measure common telecommunication system circuit parameters using appropriate test equipment.
- set up and install basic telecommunication equipment.
- design proper preventive maintenance, calibration, and system testing procedures for telecommunication equipment.
- perform proper preventive maintenance, calibration, and system testing on telecommunication equipment.
- diagnose common telecommunication system failures down to the source of the problem.
- solve telecommunication system problems by replacing failed parts.

Required Program

	Units
ET 305 DC/AC Theory and Circuit Fundamentals.....	4
ET 306 Electronics Fabrication and Soldering Techniques.....	2
ET 314 Mathematics for DC/AC Theory and Circuit Fundamentals	3
ET 315 Mathematics for Semiconductor Theory.....	3
ET 322 Semiconductors and Nanotechnology.....	4
ET 335 Integrated Circuits with Computer Applications	4
ET 340 Basic Microprocessors	4
ET 350 Receiver Circuits	5

ET 360 Electronic Servicing and Calibration Techniques (3).....	3
or ET 390 Microprocessor Systems – Troubleshooting (3)	
ET 400 Microwave Communications Techniques	4
ET 410 Transmitter Fundamentals.....	5
Total Units Required	41

Suggested Electives

CISC 310, 355; CISN 300, EDT 310, 352

Associate in Science (A.S.) Degree

The Associate in Science Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See SCC graduation requirements.

Certificate of Achievement

The Certificate of Achievement may be obtained by completion of the required program with grades of “C” or better in all courses or equivalent.

Electronics Technology (ET)

ET 140 **Smart Computing Device System Repair I** **4 Units**

*Prerequisite: None.**Hours: 48 hours LEC; 72 hours LAB*

This is an introductory course to smart computing system repair. The course will begin with an overview of the history of computing systems and repair. Information of common computer system repair, nomenclature, diagnostic software, and the theory of computing systems operations will be covered. The course will also introduce the student to the use of the Internet for locating technical repair documentation on the Web.

ET 141 **Smart Computing Device System Repair II** **3 Units**

*Prerequisite: ET 140 with a grade of “C” or better**Hours: 36 hours LEC; 54 hours LAB*

This is a second course in a series of two designed to train students in the advanced skills needed in the installation, maintenance, and repair of modern computer smart devices and systems.

ET 192 **Introduction to Robotics** **2 Units**

*Prerequisite: None.**Hours: 18 hours LEC; 54 hours LAB*

This course is an introduction to robotics utilizing various robotic systems. It explores how robots and microcontrollers interface with common electronic applications. It also investigates various applications for robots and microcontrollers. One or two field trips to local manufacturing facility such as Siemens Transportation may be required.

ET 210 **Applied Mathematics for Electronics** **3 Units**

*Prerequisite: None.**Hours: 54 hours LEC*

This is a basic course for those interested in cabling and installation electronics who do not meet the requirements for ET 314. Units of instruction include DC and AC circuit application mathematics, scientific calculators, powers of ten, and introduction to algebraic concepts as related to electronics.

ET 220 **A Survey of AC and DC Circuit Fundamentals** **5 Units**

*Prerequisite: ET 210 and 230 with grades of “C” or better or equivalent.**Hours: 54 hours LEC; 108 hours LAB*

This course is designed to provide instruction in the basic concepts of AC and DC theory including a study of resistors, capacitors, and inductors in series and parallel circuits. Laboratory use of meters, oscilloscopes, signal generators, and power supplies will be emphasized.

ET 230 **Laboratory Practices and Techniques** **1 Unit**

*Prerequisite: None.**Advisory: Concurrent enrollment in ET 210.**Hours: 54 hours LAB*

This course provides instruction in the language of electronics, safe and efficient use of tools, equipment, and chemical processes used in the laboratory including: high voltage precautions, printed circuit fabrication, equipment panel fabrication silkscreen, and state-of-the-art soldering techniques.

ET 240 **A Survey of Semiconductor Theory** **5 Units**

*Prerequisite: ET 220 with a grade of “C” or better or equivalent.**Hours: 54 hours LEC; 108 hours LAB*

This course provides a survey of diodes, transistors, FET's, and linear and digital IC's and how they are installed and used in modern electronic equipment. Laboratory will stress the hands-on manufacturing and troubleshooting of modern electronic equipment.

ET 295 **Independent Studies in Electronics Technology** **1-3 Units**

*Prerequisite: None.**Hours: 162 hours LAB*

Independent study of an electronic topic or research project. This course is for students who wish to develop an in-depth understanding in fundamental topics of electronics technology and learn to work in a collaborative atmosphere with instructors and other students. Instructor approval is required to enroll in this course.

ET 299 **Experimental Offering in Electronics Technology** **.5-4 Units**

*Prerequisite: None**Hours: 72 hours LEC*

See Experimental Offerings

ET 305 **DC/AC Theory and Circuit Fundamentals** **4 Units**

*Prerequisite: None.**Corequisite: ET 306 and 314**Course Transferable to CSU**Hours: 54 hours LEC; 54 hours LAB*

This course is designed to provide instruction in the concepts of DC and AC theory including a study of the composition of matter, circuit fundamentals, voltage, current, resistance in series, parallel, and combination circuit configurations. Laboratory activities provide hands-on projects that include operation and use of electronic equipment used by industry.

ET 306 Electronics Fabrication and Soldering Techniques 2 Units

Prerequisite: None.

Advisory: Successful completion of or concurrent enrollment in ET 305.

Course Transferable to CSU

Hours: 18 hours LEC; 54 hours LAB

This course covers the skills needed for identification and the safe and efficient use of hand tools and soldering equipment used in basic electronics repair. Familiarization with fabrication, soldering/de-soldering techniques, electrostatic discharge (ESD), assembly, and safety practices are covered.

ET 314 Mathematics for DC/AC Theory and Circuit Fundamentals 3 Units

Prerequisite: One year of high school algebra with a grade of "C" or better, or qualifying mathematics assessment test scores or equivalent.

Corequisite: ET 305

General Education: AA/AS Area II(b)

Course Transferable to CSU

Hours: 54 hours LEC

This course focuses on the application of and analysis by algebra and trigonometry to solve electronic problems in DC and AC circuits. This course was formerly known as ET 310 and ET 311.

ET 315 Mathematics for Semiconductor Theory 3 Units

Prerequisite: ET 305, 306, and 314 with grades of "C" or better; or equivalent.

Advisory: Concurrent enrollment in ET 322 and 335.

Course Transferable to CSU

Hours: 54 hours LEC

This course provides a detailed study of the mathematics required to solve problems in semiconductor circuit theory. Some of these math functions include: vector algebra, load line plotting, decibel theory and application, common and natural log functions, power supply analysis, calculation of input and output bandwidth characteristics of semiconductor amplifiers, use of rate-of-change functions to study slope of lines and their relationship to amplifier impedances, and use of network theorems to simplify complex biasing networks for amplifiers.

ET 322 Semiconductors and Nanotechnology 4 Units

Prerequisite: ET 305 with a grade of "C" or better

Corequisite: ET 314

Course Transferable to CSU

Hours: 54 hours LEC; 54 hours LAB

This course is a detailed study of semiconductor devices and their applications. Semiconductor components – such as diodes, transistors, op-amps, including their use in complex circuits – are covered. Nanotechnology theory and devices, including their present and possible future applications, are studied. One or two field trips may be required. This course was formerly known as ET 320.

ET 335 Integrated Circuits with Computer Applications 4 Units

Prerequisite: ET 305 with a grade of "C" or better

Course Transferable to CSU

Hours: 54 hours LEC; 54 hours LAB

This course covers integrated circuits (ICs) and applications used in industrial and consumer products. Topics include digital theory and applications from standard transistor-transistor logic (TTL) logic circuits to complex circuits built on programmable logic devices (PLDs). One or two field trips may be required. This course was formerly known as ET 330.

ET 340 Basic Microprocessors 4 Units

Prerequisite: None.

Course Transferable to CSU

Hours: 54 hours LEC; 54 hours LAB

This is a beginning course dealing with the circuitry and use of the microprocessor. Peripheral hardware is also considered so that the student may gain an overview of a complete computer system. The scope of the course includes machine language programming in order to provide a base for understanding the dynamic operation of the entire system. Troubleshooting philosophy is emphasized.

ET 350 Receiver Circuits 5 Units

Prerequisite: ET 315, 322, and 335 with grades of "C" or better or equivalent.

Course Transferable to CSU

Hours: 54 hours LEC; 108 hours LAB

This course focuses on the principles of radio receivers using AM, FM, and single sideband modulation systems. The course presents associated control circuits and power supply circuitry for receivers.

ET 360 Electronic Servicing and Calibration Techniques 3 Units

Prerequisite: ET 315, 322, and 335 with grades of "C" or better or equivalent.

Course Transferable to CSU

Hours: 36 hours LEC; 54 hours LAB

This course focuses on developing familiarization with laboratory and test instruments and techniques of calibration and repair. It is a practical step-by-step approach for the beginning technician in the art of troubleshooting techniques on all the electronic equipment available in the electronics laboratory.

ET 362 Modern Electronic Control Technology 3 Units

Prerequisite: None.

Corequisite: ET 305; or prior completion of with a grade of "C" or better.

Course Transferable to CSU

Hours: 36 hours LEC; 54 hours LAB

This course introduces the principles and applications of automatic control systems. Topics include general feedback control systems, analog control systems, digital control systems, Programmable logic controller (PLC) systems, sensors, and actuators. One or two field trips may be required.

ET 380 Introduction to Electronic Communications 4 Units

Prerequisite: ET 314 and 322 with grades of "C" or better

Course Transferable to CSU

Hours: 54 hours LEC; 54 hours LAB

This course covers electronic communications including UHF, VHF, microwave, satellite, and fiber optics. AM and FM transmitters, transmission lines, antennas, and receivers are analyzed down to the component level. Propagation, wave theory, decibels, and signal transmission limitations are also covered. Technician safety and proper test equipment use are stressed throughout the course. Field trips may be required.

- ET 381 Electronic Communication 3 Units**
Regulations
Prerequisite: ET 322 with a grade of "C" or better
Advisory: ET 380 with a grade of "C" or better
Course Transferable to CSU
Hours: 54 hours LEC
 This course provides an overview of the Federal Communication Commission (FCC) General Radiotelephone license requirements. It also covers the electronics theory and the rules and regulations mandated by the FCC.
- ET 390 Microprocessor Systems – 3 Units**
Troubleshooting
Prerequisite: ET 340 with a grade of "C" or better or equivalent.
Course Transferable to CSU
Hours: 18 hours LEC; 108 hours LAB
 This course will focus on the principles of microprocessor system control and troubleshooting. Study will include measurement transducers, analog-to-digital and digital-to-analog converters, power supplies, and power users. The design, construction, repair, and operation of a semester lab project controlled by a microprocessor, microcontroller, or a smart digital device will be covered.
- ET 400 Microwave Communications 4 Units**
Techniques
Prerequisite: ET 315, 322, and 335 with grades of "C" or better or equivalent.
Course Transferable to CSU
Hours: 36 hours LEC; 108 hours LAB
 This course is a study of electromagnetic waves and antennas. The course presents types of microwave generators, microwave communications systems, and antenna guidance systems. The use of lasers and fiber optics in communications systems and as a source of high tech energy control are presented.
- ET 410 Transmitter Fundamentals 5 Units**
Prerequisite: ET 315, 322, and 335 with grades of "C" or better or equivalent.
Course Transferable to CSU
Hours: 54 hours LEC; 108 hours LAB
 This is a fundamental course in AM/FM and single side-band transmitters. The course will present students with preparation for employment in the communications industry. It will include instruction in adjustment and tuning of transmitters. Students are presented with symptoms of malfunctions and remedies in troubleshooting transmitters.
- ET 491 Electronics Projects 2 Units**
Laboratory I
Prerequisite: None.
Corequisite: ET 306
Course Transferable to CSU
Hours: 108 hours LAB
 This course provides an opportunity for students to pursue typical electronics projects to learn and practice skills needed in the construction, installation, maintenance, and repair of electronic devices.
- ET 492 Electronics Projects 2 Units**
Laboratory II
Prerequisite: None.
Corequisite: ET 306
Course Transferable to CSU
Hours: 108 hours LAB
 This course provides an opportunity for students to further pursue typical electronics projects to learn and practice skills needed in the construction, installation, maintenance, and repair of electronic devices.
- ET 494 Topics in Electronics .5-4 Units**
Technology
Prerequisite: None.
Course Transferable to CSU
Hours: 9 hours LEC; 216 hours LAB
 This is a specialized course developed in cooperation with industry to address emerging training needs. Units are awarded on the basis of .5 unit for each 9 hours of lecture or 27 hours of lab.
- ET 495 Independent Studies in 1-3 Units**
Electronics Technology
Prerequisite: None.
Course Transferable to CSU
Hours: 162 hours LAB
 Independent study of an electronic topic or research project. This course is for students who wish to develop an in-depth understanding in fundamental topics of electronics technology and learn to work in a collaborative atmosphere with instructors and other students. Instructor approval is required to enroll in this course.
- ET 498 Work Experience in 1-4 Units**
Electronics Technology
Prerequisite: None.
Enrollment Limitation: According to Education Code Title V regulations, a student cannot earn academic credits in a Work Experience class unless s/he has either a job or an internship.
Course Transferable to CSU
Hours: 18 hours LEC; 300 hours LAB
 This course provides students with opportunities to develop or add marketable skills related to their vocational study programs. Course content will include understanding the application of the student's education to the workforce; the responsibilities of an internship (where applicable); completion of Title V Education Code papers (the student's Application, Learning Objectives, Time sheet, and Evaluations), which document the student's progress and hours spent at the work or internship site; and developing workplace (soft) skills identified by the Secretary's Commission on Achieving Necessary Skills (SCANS) Competencies, as well as by local employers. In addition, the student is required to fulfill 18 hours lecture and 75 hours of related, paid work experience or 60 hours of volunteer work experience for one unit; 75 or 60 hours of related work experience for each additional unit. The program allows the transfer student to combine practical, paid or non-paid work experience with college training. Only one Work Experience course may be taken per semester.
- ET 499 Experimental Offering in .5-4 Units**
Electronics Technology
Prerequisite: None
Course Transferable to CSU
Hours: 54 hours LEC; 36 hours LAB
 See Experimental Offerings