

## Electronics

### Description

Electronics is a field of technology that is concerned with the installation, operation, repair, maintenance, calibration, modification and service of electronic circuitry, components and systems. Technicians are also trained to diagnose problems arising from electro-mechanical malfunctions and to assist engineers or technologists in preparing prototypes of electronic units or systems.

### Program Emphasis

Graduates of the Electronics program understand the physical sciences, mathematics, applications and customer relations necessary in the installation, construction, programming, operation, maintenance and diagnosis of microcomputers and microprocessor based systems.

Faculty	Office	Telephone
Fred Julian	A-107D	(619) 388-3720
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### Career Options

Electronic Technician

### Academic Programs

#### Certificate of Achievement: Electronics

This certificate of achievement provides basic preparation for electronic technicians.

Courses Required for the Major:	Units
ELDT 123, 123L, Introduction to Digital Circuits and Laboratory .....	3,1

ELDT 124, 124L, Basic DC/AC Electronics and Laboratory .....	4,1
ELDT 125, 125L, DC/AC Circuit Analysis with PSpice and Laboratory .....	4,1
ELDT 126, 126L, Introduction to Programming with C and C++ and Laboratory.....	3,1
ELDT 143, 143L, Semiconductor Devices and Laboratory .....	3,1.5
ELDT 144, 144L, OP-AMPS, Sensors & Computers and Laboratory .....	3,1.5
<b>Total Units =</b>	<b>27</b>

#### Certificate of Achievement: Electronics

##### Electronic Communication Systems Option

This program prepares students to function in entry level positions in electronic communication systems.

Courses Required for the Major:	Units
Complete the requirements for the Certificate of Achievement: Electronics, as specified above,.....	27
<b>In addition, complete:</b>	
ELDT 227, 227L, Lasers and Fiberoptics & Laboratory .....	3,1
ELDT 228, 228L, Communication Circuits and CET/NARTE Preparation & Certification Laboratory .....	3,1
ELDT 229, 229L, Advanced Telecommunications Networks & Laboratory.....	3,1
<b>Total Units =</b>	<b>39</b>

#### Certificate of Achievement: Electronics

##### Electronic Microprocessor/Microcontroller Design Option

This program provides basic preparation in the electronic microprocessor and/or microcontroller occupation.

Courses Required for the Major:	Units
Complete all the requirements for the Certificate of Achievement: Electronics, as specified above,.....	27
<b>In addition, complete:</b>	
ELDT 224, 224L, Microprocessor Design & Laboratory .....	3,1.5
ELDT 230, 230L, Advanced Computer Designs & Laboratory .....	3,1
ELDT 231, Advanced System Interfacing .....	3
<b>Total Units =</b>	<b>38.5</b>

## Associate in Science Degree: Electronics

### Electronic Communication Systems Option

An Associate in Science Degree may be earned in Electronic Communication Systems. Complete the appropriate Certificate of Achievement in Electronic Systems and add: Electronic Systems 230, 230L, 231.

Courses Required for the Major:	Units
Complete all the requirements for the Certificate of Achievement, Electronic Communication Systems Options, as specified above, .....	38
<b>In addition, complete:</b>	
ELDT 230, 230L, Advanced Computer Designs & Laboratory .....	3,1
ELDT 231, Advanced System Interfacing.....	3
<b>Total Units =</b>	<b>45</b>

## Associate in Science Degree: Electronics

### Electronic Microprocessor/Microcontroller Design Option

An Associate in Science Degree may be earned in Electronic Microprocessor/Microcontroller Design Option. Complete the appropriate Certificate of Achievement in Electronic Systems and add: Electronic Systems 230, 230L, 231.

Courses Required for the Major:	Units
Complete all the requirements for the Certificate of Achievement, Electronic Microprocessor/Microcontroller Design Option, as specified above, .....	38.5
<b>In addition, complete:</b>	
ELDT 230, 230L, Advanced Computer Designs & Laboratory .....	3,1
ELDT 231, Advanced System Interfacing.....	3
<b>Total Units =</b>	<b>45.5</b>

Additional general education and graduation requirements for the associate degree are listed in the catalog ACADEMIC REQUIREMENTS section. **The associate degree requires a minimum of 60 units.**

**Recommended electives:** Electronic Systems 198, 270, 290.

### Transfer Information

Students planning to transfer to a four-year college or university should complete courses required for the university major and the general education pattern required by that transfer institution. See catalog TRANSFER INFORMATION section. Additional courses

may be required to meet university lower-division requirements. **Course requirements at the transfer institution are subject to change and may be verified by a counselor or by consulting the current university catalog. Many Baccalaureate in Arts degrees require third semester competency in a foreign language. Consult the current catalog of the transfer institution and consult with a counselor.**

Note: A Bachelor of Science degree in Electronic Engineering is offered by CSU Chico, Dominguez Hills, Fullerton, Sacramento and CSPU, Pomona. Obtain further information in the Transfer Center and see a counselor for transfer planning.

## Courses

### Electronic Systems (ELDT)

#### 100 Electronic Assembly and Certification

2 hours lecture, 6 hours lab, 4 units  
Grade Only

*Advisory:* English 43 and English 42, each with a grade of "C" or better or equivalent, or Assessment Skills Levels W4 and R4; and Mathematics 35 with a grade of "C" or better, or equivalent, or Assessment Skill Level M30.

*Limitation on Enrollment:* This course is open to students with credit for Electronic Systems 110 or Digital Technology 100.

This is a combination electronic survey and electronic assembly course. Using a modular approach, students are systematically promoted from one electrical concept to the next. Topics include D.C. electronics, A.C. electronics, semiconductors, power supplies, amplifiers, oscillators, digital gates, and fiber optics (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

#### 123 Introduction to Digital Circuits

3 hours, 3 units  
Grade Only

*Advisory:* Concurrent enrollment in Electronic Systems 123L.

*Limitation on Enrollment:* This course is not open to students with credit for Electronic Systems 220, 223 or Digital Technology 223.

This course is an introduction to digital technology with an emphasis on understanding, constructing and troubleshooting integrated circuits. Course content includes number systems and codes, truth tables, Boolean functions, combinatorial logic, registers,

counters and device characteristics. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

### 123L Digital Circuits Laboratory

**3 hours lab, 1 unit  
Grade Only**

*Advisory:* Concurrent enrollment in Electronic Systems 123.

*Limitation on Enrollment:* This course is not open to students with credit for Electronic Systems 222A, 223L or Digital Technology 223L.

This laboratory course is designed to demonstrate the concepts studied in Electronic Systems 123 and to familiarize students with a variety of digital electronic components and circuits. Emphasis is placed on developing students' skills in designing, analyzing and constructing simple logic circuits including basic digital blocks, combinational networks, and sequential networks. (FT). Associate Degree Credit & transfer to CSU and/or private colleges and universities.

### 124 Basic DC/AC Electronics

**4 hours, 4 units  
Grade Only**

*Advisory:* Mathematics 95 with a grade of "C" or better, or equivalent, or Assessment Skill Level M40; and concurrent enrollment in Electronic Systems 124L.

*Limitation on Enrollment:* This course is not open to students with credit for Electronics Technology 120A or Digital Technology 124.

This course is a study of basic electricity and electrical circuit concepts. Course content includes Ohm's and Kirchhoff's Laws, Superposition Theorem, Thevenin's and Norton's Theorems, direct current (DC) series and parallel circuits, the generation and nature of alternating current (AC), power, capacitance, inductance, and magnetic circuits. Throughout the course, students apply the concepts of basic electronics to solve problems commonly found in industrial settings. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

### 124L Basic DC/AC Laboratory

**3 hours lab, 1 unit  
Grade Only**

*Advisory:* Mathematics 95 with a grade of "C" or better, or equivalent, or Assessment Skill Level M40; and concurrent enrollment in Electronic Systems 124.

*Limitation on Enrollment:* This course is not open to students with credit for Electronics Technology 121A or Digital Technology 124L.

This laboratory course demonstrates the basic concepts of electricity and electrical circuits and familiarizes students with various electronic components and circuits. Course content is designed to develop students' skills in reading schematic diagrams, fabricating simple circuits, and safely using basic test equipment for measuring and troubleshooting. Equipment used in this laboratory includes volt-ohm-amp meters, oscilloscopes, digital multimeters (DMMs), function generators, and power supplies. (FT). Associate Degree Credit & transfer to CSU and/or private colleges and universities.

### 125 DC/AC Circuit Analysis with Pspice

**4 hours, 4 units  
Grade Only**

*Advisory:* Electronic Systems 124 and 124L, each with a grade of "C" or better, or equivalent; and Mathematics 96 with a grade of "C" or better, or equivalent, or Assessment Skill Level M50; and concurrent enrollment in Electronic Systems 125L.

*Limitation on Enrollment:* This course is not open to students with credit for Digital Technology 125.

This course is a study of direct current and alternating current (DC/AC) electronic circuit analysis. Course material emphasizes circuit simulations on computers utilizing Pspice application to analyze current; voltage; resistance; capacitance; inductance; power and energy as well as series, parallel, and combination circuits; network theorems; transformers; passive filters, and response curves. (FT). Associate Degree Credit & transfer to CSU and/or private colleges and universities.

### 125L DC/AC Circuit Analysis Laboratory

**3 hours lab, 1 unit  
Grade Only**

*Advisory:* Electronic Systems 124 and 124L, each with a grade of "C" or better, or equivalent; and Mathematics 96 with a grade of "C" or better, or equivalent, or Assessment Skill Level M50; and concurrent enrollment in Electronic Systems 125.

*Limitation on Enrollment:* This course is not open to students with credit for Digital Technology 125L.

This laboratory course demonstrates the basic concepts of computer assisted direct current and alternating current (DC/AC) circuit analysis. Equipment used in this course includes microcomputers utilizing industry standard software applications Pspice), volt-ohm-amp meters (VOMs), oscilloscopes, digital multimeters (DMM's), function generators, and power supplies. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

**126 Using C and C++ for Technology****3 hours, 3 units  
Grade Only**

*Advisory:* Concurrent enrollment in Electronic Systems 126L.

This course is an introduction to the C and C++ programming languages as they apply to the analysis of the theoretical concepts of electronic technology. The course is structured around a variety of prepared programming assignments that emphasize problem solving techniques and use of the computer as a problem solving tool with applications in electronics. Students work with state of the art and industry standard microcomputers, hardware, software application programs, and compilers. This course is designed as preparation for majors in the field of Electronics. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

**126L Using C and C++ for Technology  
Laboratory****3 hours lab, 1 unit  
Grade Only**

*Advisory:* Concurrent enrollment in Electronic Systems 126.

This course provides the laboratory component to the study of C and C++ programming languages as they apply to the analysis of the theoretical concepts of electronic technology. The course is structured around a variety of prepared programming assignments that emphasize problem solving techniques and use of the computer as a problem solving tool with applications in electronics. Students work with state of the art and industry standard microcomputers, hardware, software application programs and compilers. This course is designed as preparation for majors in the field of Electronics. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

**143 Semiconductor Devices****3 hours, 3 units  
Grade Only**

*Advisory:* Electronic Systems 124 and 124L, each with a grade of "C" or better, or equivalent; and Mathematics 96 with a grade of "C" or better, or equivalent, or Assessment Skill Level M50; and concurrent enrollment in Electronic Systems 143L.

*Limitation on Enrollment:* This course is not open to students with credit for Electronic Systems 140A or Digital Technology 143.

This course is an introductory study of the characteristics and operation of semiconductor devices and their associated circuitry. Emphasis is placed on

junction diodes, bipolar-junction transistors, power supplies, feedback, linear integrated circuits (IC's), multistage amplifiers, push-pull amplifiers, junction field-effect transistors (JFETs), metal oxide semiconductor field-effect transistors (MOSFETs) and PSpice analysis. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

**143L Semiconductor Devices Laboratory****4.5 hours lab, 1.5 units  
Grade Only**

*Advisory:* Electronic Systems 124 and 124L, each with a grade of "C" or better, or equivalent; and Mathematics 96 with a grade of "C" or better, or equivalent, or Assessment Skill Level M50; and concurrent enrollment in Electronic Systems 143.

*Limitation on Enrollment:* This course is not open to students with credit for Electronics Technology 142A or Digital Technology 143L.

This laboratory course focuses on the theoretical concepts of electronic devices and circuits through practical experimentation, Pspice analysis and computer simulation. Course content and materials include circuit operation, testing, troubleshooting and measurement of diodes, transistors and field-effect transistors (FETs), the use of computer-aided engineering software, microcomputers, oscilloscopes, digital multimeters (DMM's), function generators, and power supplies. (FT). Associate Degree Credit & transfer to CSU and/or private colleges and universities.

**144 OP-AMPS, Sensors and Computers****3 hours, 3 units  
Grade Only**

*Advisory:* Mathematics 96 with a grade of "C" or better, or equivalent, or Assessment Skill Level M50; and concurrent enrollment in Electronic Systems 144L; and completion of or concurrent enrollment in Electronic Systems 143 and 143L, each with a grade of "C" or better, or equivalent.

*Limitation on Enrollment:* This course is not open to students with credit for Digital Technology 144. This course is a study of operational amplifier theory and circuit applications. Course content emphasizes sensors, transducers, data conversions, and the associated circuitry necessary to condition outputs for interface to a computer. Applications to analog-to-digital and digital-to-analog conversions, optical sensors, displacement transducers and instrumentation devices are included. This course is designed as preparation for majors in the field of Electronics. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

**144L OP-AMPS and Sensors Laboratory****4.5 hours lab, 1.5 units  
Grade Only**

*Advisory:* Mathematics 96 with a grade of "C" or better, or equivalent, or Assessment Skill Level M50; and concurrent enrollment in Electronic Systems 144; and completion of or concurrent enrollment in Electronic Systems 143 and 143L, each with a grade of "C" or better, or equivalent.

*Limitation on Enrollment:* This course is not open to students with credit for Digital Technology 144L. This course provides the laboratory component to the study of operational amplifier theory and circuit applications. Course content emphasizes sensors, transducers, data conversions and the associated circuitry necessary to condition outputs for interface to a computer. Applications to analog-to-digital and digital-to-analog conversions, optical sensors, displacement transducers and instrumentation devices are included. This course is designed as preparation for majors in the field of Electronics. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

**198 Computer Applications in Electronics****2 hours lecture, 3 hours lab, 3 units  
Grade Only**

*Limitation on Enrollment:* This course is not open to students with credit for Digital Technology 198. This course is a presentation of computer applications in electronics through specific software and hardware currently utilized in local in electronics business and industry. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

**224 Microprocessor Design****3 hours lecture, 3 units  
Grade Only**

*Advisory:* Completion of or concurrent enrollment in Electronic Systems 123 and Electronic Systems 123L, each with a grade of "C" or better, or equivalent and concurrent enrollment in Electronic Systems 224L. This course is an applied study of digital circuits in microcomputer systems. Throughout the course, students examine the overall architecture of microcomputer systems, the interfacing of memory and input/output (I/O) devices, and machine language programming for the Z-80 microprocessor. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

**224L Microprocessor Design Laboratory****4.5 hours lab, 1.5 units  
Grade Only**

*Advisory:* Completion of or concurrent enrollment in Electronic Systems 123 and Electronic Systems 123L, each with a grade of "C" or better, or equivalent concurrent enrollment in Electronic Systems 224. This laboratory course demonstrates the application of digital circuits in microprocessor systems. Course content includes assembly of printed circuit boards, troubleshooting of microprocessor-based designs and software/firmware design and troubleshooting. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

**227 Introduction to Lasers and Fiber Optics****3 hours, 3 units  
Grade Only**

*Advisory:* Mathematics 96 with a grade of "C" or better, or equivalent, or Assessment Skill Level M50; and concurrent enrollment in Electronic Systems 227L; and completion of or concurrent enrollment in Electronic Systems 124 and 124L, each with a grade of "C" or better, or equivalent.

*Limitation on Enrollment:* This course is not open to students with credit for Digital Technology 144. This course is an introductory study of lasers, optical power meters, and laser systems designed to familiarize students with various industry supported lasers/fiber optics families. Emphasis is placed on providing students with a working knowledge of lasers and the ability to troubleshoot in the field. Topics covered include the properties of light, emission and absorption of light, lasing action, the temporal and spatial characteristics of lasers, optical energy, optical fibers, light sources, light receivers, fiber optic geometry, alignment and splicing techniques, communication links, and fiber optic system design. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

**227L Lasers and Fiber Optics Laboratory****3 hours lab, 1 unit  
Grade Only**

*Advisory:* Mathematics 96 with a grade of "C" or better, or equivalent, or Assessment Skill Level M50; and concurrent enrollment in Electronic Systems 227; and completion of or concurrent enrollment in Electronic Systems 124 and 124L, each with a grade of "C" or better, or equivalent.

This laboratory course is designed to familiarize students with the elements and operation of lasers, optical power meters, and laser and fiber optics systems

through experiments and projects conducted individually and in groups. This course provides students with the opportunity to enhance and further investigate the concepts presented in Electronic Systems 227. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

### **228 Communication Circuits and CET/NARTE Preparation**

**3 hours, 3 units  
Grade Only**

*Advisory:* Mathematics 96 with a grade of "C" or better, or equivalent, or Assessment Skill Level M50; and concurrent enrollment in Electronic Systems 228L; and completion of or concurrent enrollment in Electronic Systems 143 and 143L and 144 and 144L, each with a grade of "C" or better, or equivalent.

*Limitation on Enrollment:* This course is not open to students with credit for Digital Technology 228.

This course is a study of basic communication theory and is designed to Prepare students to take the Associate Electronics Technician (CET) and the 3rd Class Radio Telecommunications Technician (NARTE) examinations. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

### **228L Communication Circuits and Certification Laboratory**

**3 hours lab, 1 unit  
Grade Only**

*Advisory:* Mathematics 96 with a grade of "C" or better, or equivalent, or Assessment Skill Level M50; and concurrent enrollment in Electronic Systems 228; and completion of or concurrent enrollment in Electronic Systems 143 and 143L and 144 and 144L, each with a grade of "C" or better, or equivalent.

*Limitation on Enrollment:* This course is not open to students with credit for Digital Technology 228L. This laboratory course is a verification of the theoretical concepts of communication theory and mastery of the basic electronic instruments used in industry. This course is designed to prepare students to take the Associate Electronics Technician (CET) and the 3rd Class Radio Telecommunications Technician (NARTE) examinations. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

### **229 Advanced Telecommunications Networks**

**3 hours, 3 units  
Grade Only**

*Advisory:* Mathematics 96 with a grade of "C" or better, or equivalent, or Assessment Skill Level M50; and concurrent enrollment in Electronic Systems 229L; and

completion of or concurrent enrollment in Electronic Systems 126 and 126L and 228 and 228L, each with a grade of "C" or better, or equivalent.

This course is a project-oriented course that focuses on local, metropolitan, and wide-area network hardware system design, installation, maintenance and troubleshooting. Hardware topics presented include topologies, transmission media, access and interfacing techniques. Hardware technologies utilized include Fiber Distributed Data Interface (FDDI), Asynchronous Transfer Mode (ATM), Fast Internet and Token Ring. This course prepares students to take the Network Plus exam. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

### **229L Advanced Telecommunications Networks Laboratory**

**3 hours lab, 1 unit  
Grade Only**

*Advisory:* Mathematics 96 with a grade of "C" or better, or equivalent, or Assessment Skill Level M50; and concurrent enrollment in Electronic Systems 229; and completion of or concurrent enrollment in Electronic Systems 126 and 126L and 228 and 228L, each with a grade of "C" or better, or equivalent.

This is a team project-oriented course that familiarizes students with the hardware and software needed to establish, run, and maintain advanced telecommunications networks at the local, metropolitan, and wide-area levels. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

### **230 Advanced Computer Designs**

**3 hours, 3 units  
Grade Only**

*Advisory:* Concurrent enrollment in Electronic Systems 230L; and completion of or concurrent enrollment in Electronic Systems 224 and 224L, each with a grade of "C" or better, or equivalent.

*Limitation on Enrollment:* This course is not open to students with credit for Digital Technology 230. This course is an advanced practical study of operating systems, chip sets, system board configurations, and bus architecture. Emphasis is placed on the application of digital course material to modern microprocessor-based systems from a design perspective. This project oriented course examines: microprocessor machine language programming, hardware devices, hardware designs, system clock generation, bus characteristics, tri-state characteristics, buffers, I/O techniques, major microprocessor family comparisons, timing diagrams, memory organization, ROM, EPROM, RAM, memory

mapping, memory refresh, decoding techniques and chip level troubleshooting. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

**230L Advanced Computer Designs Laboratory**  
**3 hours lab, 1 unit**  
**Grade Only**

*Advisory:* Concurrent enrollment in Electronic Systems 230; and completion of or concurrent enrollment in Electronic Systems 224 and 224L, each with a grade of "C" or better, or equivalent.

*Limitation on Enrollment:* This course is not open to students with credit for Digital Technology 230L. This is a practical course designed as a verification of the student's understanding of the theoretical concepts of computer and microprocessor based designs through construction and testing of a complete microcomputer system. Throughout the course, students work with several pieces of electronic test equipment currently used in the industry in order to build and troubleshoot their projects. Students are expected to locate and purchase necessary components and breadboarding materials. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

**231 Advanced System Interfacing**  
**3 hours, 3 units**  
**Grade Only**

*Advisory:* Electronic Systems 224 and 224L, each with a grade of "C" or better, or equivalent; and concurrent enrollment in Electronic Systems 230 and 230L.

*Limitation on Enrollment:* This course is not open to students with credit for Digital Technology 231. This course is a continuation of the study of microprocessors and their support families. Course material emphasizes peripheral chips and various microprocessors that work together to add intelligence to modern electronic equipment. This course is designed to expose students to common usage microprocessor devices in order to gain a working knowledge of I/O techniques and to be able to troubleshoot in the field. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

**251 A+ Certification**  
**3 hours, 3 units**  
**Grade only**

This course is an open entry/exit course providing preparation for employment in the electronics industry by becoming an A+ Certified Technician. Students pass a rigorous proctored computer-based exam that tests

their knowledge of configuring, installing, diagnosing, repairing, upgrading, and maintaining microcomputers and their peripherals. Upon passing the exam, students are awarded the A+ Certification with a specialty in Microsoft Windows/DOS environments. (FT) Associate Degree Credit.

**251L A+ Certification Laboratory**  
**3 hours lab, 1 unit**  
**Grade only**

This course is an open entry/exit course providing preparation for employment in the electronics industry by becoming an A+ Certified Technician. Using simulated examinations, students are systematically promoted from one major topic to the next. (FT) Associate Degree Credit.

**270 Work Experience**  
**Hours by Arrangement, 1-4 units**  
**Grade Only**

*Limitation on Enrollment:* Must obtain an Add Code from Work Experience Coordinator for registration. To receive credit, a student must complete a minimum of seven units during the semester, including work experience. This course is not open to students with credit for Digital Technology 270.

A program of on-the-job learning experiences for students employed in a job related to their major. The combined maximum credit for all work experience courses from all disciplines may not exceed 16 units. To receive credit, a student must complete a minimum of seven units during the semester, including work experience. Associate Degree Credit & transfer to CSU and/or private colleges and universities.

**290 Independent Study**  
**1-3 Hours by Arrangement, 1-3 units**  
**Grade Only**

*Limitation on Enrollment:* Must obtain an Add Code from instructor for registration. This course is not open to students with credit for Digital Technology 290. For advanced students in Electronic Systems or Electro-Optical Technology who wish to pursue special problems and projects relating to their particular subject area. The student meets with the instructor at specific intervals and is expected to do primary research, analyze problems and submit reports. This course may be taken four times with different content for a maximum of six units. (FT) Associate Degree Credit & transfer to CSU and/or private colleges and universities.

***This discipline may offer specialized instruction in one or more of the following areas: Supervised***

*Tutoring (044), Special Topics (265), Independent Study (290), Individualized Instruction (296), Service Learning (277), Applied Applications and Software Skills (045L), or Work Experience (270). Detailed course descriptions are listed on page 96. Please refer to the class schedule and/or see the dean or department chair for availability.*