

# ELECTRICAL AND COMPUTER ENGINEERING TECHNOLOGY

## Electrical and Computer Engineering Technology with Specializations in:

- Electronics
- Laser and Photonics
- Robotics and Mechatronics
- Career Path to Valencia's B.S. Degree in Electrical and Computer Engineering Technology

## Associate in Science Degree (CIP# 1615030301)

This program is designed to produce highly skilled technicians capable of assisting in the design, production, operation and servicing of electronics, optics, photonics, lasers, robotics and mechatronics systems and equipment. The specializations will provide an up-to-date curriculum in electronics engineering, lasers and photonics, and robotics and mechatronics technology. Valencia is a Center of Electronics Emphasis in Florida and is equipped with special test equipment and advanced laboratories, which provide the latest in hands-on experience.

Students are strongly encouraged to consult a student success coach in the department office for assistance in determining the best education plan for their career goals.

Although scheduling may not always provide for the following progression of courses, students should use the foundation, intermediate and advanced course sequence as a guide in program planning.

All degree-seeking students must satisfy entry testing requirements and satisfactorily complete all mandatory courses in reading, student success, mathematics, English, and English for Academic Purposes in which the student is placed.

## Alternative Ways to Earn Credit toward this Degree

Graduates of specific programs at Orange Technical College and Osceola Technical College, as well as other institutions may be eligible to receive college credit for courses in this program. You may also be eligible to receive credit toward this degree if you have earned one of the approved Gold Standard industry certifications or Career Pathways credit. To learn more about Valencia's award of credit options, visit <https://valenciacollege.edu/academics/programs/as-degree/credit-industry-certification-agreements.php>. Eligible students should contact the Student Success Coach in their academic department for more information about the requirements for the award of credit.

## College Credit Technical Certificates

The Electronics Engineering A.S. degree also offers the following college credit certificate programs. These certificates can put you on the fast-track to reaching your career goals. They are designed to equip you with a specialized skill set for entry-level employment or to upgrade your skills for job advancement. Most can be completed in one year or less, and all of the courses in the certificates are embedded in the A.S. degree. You can earn the certificates as you progress through your A.S. Degree or as a separate, stand-alone credential. Click on the Certificate tab at the top of the page for more information about the certificates that are offered.

- Laser and Photonics Technician (12 credits) (CIP # 0615030411)
- Robotics Applications Technician (12 credits) (CIP # 0615040514)
- Basic Electronics Technician (14 credits) (CIP # 0615030310)
- Advanced Electronics Technician (31 credits) (CIP # 0615030309)

## Start Right

Degree-seeking students enrolling at Valencia for the first time will have a limited range of courses from which to choose for their first 18 college-level credits. Within the first 18 college credit hours, you will be required to take ENC1101 (3 credits), and if applicable, SLS 1122 (3 credits) and a mathematics course appropriate to your selected meta-major (3 credits). The remaining courses will be chosen from the General Education Core Courses in humanities (3 credits), science (3 credits), or social science (3 credits), and/or the introductory courses within the A.S. degree programs. For specific courses see the *Foundation Courses* on the "Program Requirements" tab. For course sequencing recommendations, see your Student Success Coach or create an education plan by logging into Atlas, clicking on the LifeMap tab and clicking My Education Plan.

## Potential Careers

- Electronics Technician
- Field Technician
- System Technician
- Electronics Tester
- Fiber Optics Specialist
- Instrumentation Technician
- Robotics and Simulation Technician
- Laser Specialist

## Salary & Earnings Information

For career information related to this program, please visit **O\*Net OnLine** (<https://www.onetonline.org/>).

## Contacts

### Future Students

To learn more about this program, contact Enrollment Services at [enrollment@valenciacollege.edu](mailto:enrollment@valenciacollege.edu) or 407-582-1507 or visit <https://valenciacollege.edu/electrical-engineering/>

### Current Students

Your Student Success Coach contact information can be found in Atlas. Log into Atlas, click on the Courses tab, and check your Academic Profile information to find a link to your Coach.

### **West Campus Faculty Program Chair**

Radu Bunea: 407-582-1360  
[rbunea@valenciacollege.edu](mailto:rbunea@valenciacollege.edu)

## Internship and Workforce Services

If you need assistance with job resources or in locating an internship, please visit: [valenciacollege.edu/internship](https://valenciacollege.edu/internship) (<https://valenciacollege.edu/internship/>).

## Career Path in Electronics, Laser and Photonics, or Robotics and Mechatronics Specializations

### Program Outcomes

- Apply basic mathematical and engineering concepts to technical problem solving
- Accept professional and ethical responsibilities of the engineering technology profession
- Communicate effectively in technical and non-technical environments

### Program Requirements

#### Foundation Courses

EET 1214C	INTRODUCTION TO ENGINEERING TECHNOLOGY	3
MTB 1329	MATHEMATICS FOR ENGINEERING TECHNOLOGY	3
MAC 1105	COLLEGE ALGEBRA *~	3
PHY 1020	FUNDAMENTALS OF PHYSICS (or higher) ~ <sup>1</sup>	3
or CHM 1020	CHEMISTRY IN EVERYDAY LIFE	
ENC 1101	FRESHMAN COMPOSITION I *~	3
Humanities	See Gen. Ed. Core Requirements ~	3
POS 2041	U.S. GOVERNMENT *~	3
or AMH 2010	UNITED STATES HISTORY TO 1877	
or AMH 2020	U.S. HISTORY 1877 TO PRESENT	

#### Intermediate Courses

ETS 2210C	PRINCIPLES OF PHOTONICS *	3
CET 2114C	DIGITAL SYSTEMS *	3
EET 2036C	PRINCIPLES OF ELECTRIC CIRCUITS *	3
or EET 1025C	FUNDAMENTALS OF AC CIRCUITS	
EET 2141C	SEMICONDUCTOR DEVICES AND CIRCUITS *	3
CET 2123C	FUNDAMENTALS OF MICROPROCESSORS *	3

Specialization (See below) 32

**Total Credit Hours 68**

+ This course must be completed with a grade of C or better.

\* This course has a prerequisite; check description in Valencia catalog.

~ This is a general education course.

(GB) notes a Gordon Rule course.

<sup>1</sup> PHY 2048C GENERAL PHYSICS WITH CALCULUS I, PHY 2053C GENERAL PHYSICS I or higher can be used instead of PHY 1020 FUNDAMENTALS OF PHYSICS; CHM 1045C GENERAL CHEMISTRY WITH QUALITATIVE ANALYSIS I or higher can be used instead of CHM 1020 CHEMISTRY IN EVERYDAY LIFE

<sup>2</sup> This course has a corequisite. Please check the course description in the Valencia catalog.

## Electronics Specialization Program Outcome

- Assist in the design, operation, and troubleshooting of electronic systems

EET 2325C	RF COMMUNICATION *	3
EET 2365C	WIRELESS AND DATA COMMUNICATIONS *	3
EET 2142C	INTEGRATED CIRCUITS *	3
ETS 2511C	ELECTROMECHANICAL SYSTEMS *	3
ETS 2542C	PROGRAMMABLE LOGIC CONTROLLERS *	3
CET 2118C	FPGA DESIGN USING VHDL *	3
Electrical and Computer Engineering Technology Electives		14
<b>Total Credit Hours</b>		<b>32</b>

\* This course has a prerequisite; check description in Valencia catalog.

## Laser and Photonics Specialization Program Outcome

- Assist in the design, operation, and troubleshooting of laser and photonics equipment and systems

ETS 2220C	PRINCIPLES OF FIBER OPTICS COMMUNICATION *	3
ETS 2221C	ELECTRO-OPTICAL DEVICES *	3
ETS 2230C	PRINCIPLES OF LASERS *	3
EET 2325C	RF COMMUNICATION *	3
EET 2365C	WIRELESS AND DATA COMMUNICATIONS *	3
EET 2142C	INTEGRATED CIRCUITS *	3
Electrical and Computer Engineering Technology Electives		14
<b>Total Credit Hours</b>		<b>32</b>

\* This course has a prerequisite; check description in Valencia catalog.

<sup>2</sup> This course has a corequisite. Please check the course description in the Valencia catalog.

## Robotics and Mechatronics Specialization Program Outcome

- Assist in the Design, Operation, and Troubleshooting of Robotics and Mechatronics Systems

ETS 1603C	FUNDAMENTALS OF ROBOTICS AND SIMULATION *	3
ETS 2604C	ROBOTICS APPLICATIONS *	3
EET 2325C	RF COMMUNICATION *	3
EET 2365C	WIRELESS AND DATA COMMUNICATIONS *	3
ETS 2542C	PROGRAMMABLE LOGIC CONTROLLERS *	3
ETS 2511C	ELECTROMECHANICAL SYSTEMS *	3
Electrical and Computer Engineering Technology Electives		14
<b>Total Credit Hours</b>		<b>32</b>

\* This course has a prerequisite; check description in Valencia catalog.

**Electrical and Computer Engineering Technology Electives**

The Electives requirement may be satisfied with any course(s) offered in the A.S. Electrical and Computer Engineering Technology degree, not already used to satisfy program requirements or the Program Chair of A.S. ECET or Dean ETAM approval.

\* This course has a prerequisite; check description in Valencia catalog.

**Notes:**

Upon earning the A.S. Degree in Electrical and Computer Engineering Technology, students can continue at Valencia to complete the Bachelor's Degree in Electrical and Computer Engineering Technology. Additional education at the bachelor's level can enhance your skills and create more career opportunities. Students who wish to continue their education should consult with their Student Success Coach and/or the Program Chair of A.S. ECET to determine the best education plan for their career goals.

**Career Path to Valencia's B.S. Degree in Electrical and Computer Engineering Technology Program Outcomes**

- Assist in the design, operation, and troubleshooting of electronic systems
- Apply basic mathematical and engineering concepts to technical problem solving
- Accept professional and ethical responsibilities of the engineering technology profession
- Communicate effectively in technical and non-technical environments

**Foundation Courses**

EET 1214C	INTRODUCTION TO ENGINEERING TECHNOLOGY <sup>+</sup>	3
MAC 1105	COLLEGE ALGEBRA <sup>++~</sup>	3
ETS 2210C	PRINCIPLES OF PHOTONICS <sup>++</sup>	3
CET 2114C	DIGITAL SYSTEMS <sup>++</sup>	3
SPC 1608	FUNDAMENTALS OF SPEECH <sup>++~</sup>	3
or SPC 1608H	FUNDAMENTALS OF SPEECH - HONORS	
or SPC 1017	INTERPERSONAL COMMUNICATION	
or SPC 1017H	INTERPERSONAL COMMUNICATION HONORS	
ENC 1101	FRESHMAN COMPOSITION I <sup>++~</sup>	3
or ENC 1101H	FRESHMAN COMPOSITION I - HONORS	
Humanities	See Gen. Ed. Core Requirements <sup>~</sup>	6
POS 2041	U.S. GOVERNMENT <sup>~</sup>	3
or AMH 2010	UNITED STATES HISTORY TO 1877	
or AMH 2020	U.S. HISTORY 1877 TO PRESENT	

**Intermediate Courses**

EET 2036C	PRINCIPLES OF ELECTRIC CIRCUITS <sup>++</sup>	3
ETS 2220C	PRINCIPLES OF FIBER OPTICS COMMUNICATION <sup>++*</sup>	3
EET 2141C	SEMICONDUCTOR DEVICES AND CIRCUITS <sup>++</sup>	3
ETS 2542C	PROGRAMMABLE LOGIC CONTROLLERS <sup>++</sup>	3

ETS 2511C	ELECTROMECHANICAL SYSTEMS <sup>++</sup>	3
CET 2118C	FPGA DESIGN USING VHDL <sup>++</sup>	3
CET 2123C	FUNDAMENTALS OF MICROPROCESSORS <sup>++</sup>	3

MAC 1114	COLLEGE TRIGONOMETRY <sup>++~</sup>	3
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**Advanced Courses**

EET 2325C	RF COMMUNICATION <sup>++</sup>	3
EET 2365C	WIRELESS AND DATA COMMUNICATIONS <sup>++</sup>	3
EET 2142C	INTEGRATED CIRCUITS <sup>++</sup>	3
EGN 2045	ENGINEERING AND TECHNOLOGY CALCULUS I <sup>*</sup>	3
PHY 2053C	GENERAL PHYSICS I <sup>++~^</sup>	3
or PHY 2048C	GENERAL PHYSICS WITH CALCULUS I	
EET 2942	INTERNSHIP IN ELECTRONICS ENGINEERING TECHNOLOGY <sup>*</sup>	2

**Total Credit Hours 68**

- + This course must be completed with a grade of C or better.
- \* This course has a prerequisite; check the description in the Valencia catalog.
- ~ This is a general education course.
- (GR) denotes a Gordon Rule course.
- ^ Students intending to complete a graduate degree in Electrical Engineering or similar should complete MAC 2311 and PHY 2048C.
- ˘ This course has a corequisite. Please check the course description in the Valencia catalog.

**Advanced Electronics Technician**

**Technical Certificate**

This program is designed to prepare individuals for employment as electrical and electronics technicians, electronic testers or in related occupations in electronics. The program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the manufacturing career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the manufacturing career cluster. The content includes but is not limited to DC circuits, AC circuits, solid-state devices, analog circuits, and digital circuits. Integrated into this content will be communications skills, leadership skills, human relations skills, employability skills, safe and efficient work practices, use of circuit diagrams and schematics, soldering, laboratory practices and technical recording and reporting. This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the Electronics Engineering industry; planning, management, finance, technical and product skills, underlying principles of technology, labor issues, community issues and health, safety, and environmental issues.

The program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education to pursue the Electrical and Computer Engineering Technology Bachelor in Science degree at Valencia College for career advancement.

**Program Outcomes:**

- Assist in the design, operation, and troubleshooting of technical systems

Required: 24

EET 1214C	INTRODUCTION TO ENGINEERING TECHNOLOGY *
MTB 1329	MATHEMATICS FOR ENGINEERING TECHNOLOGY
or MAC 1105	COLLEGE ALGEBRA
or HIGHER	
ETS 2210C	PRINCIPLES OF PHOTONICS *
or ETS 2542C	PROGRAMMABLE LOGIC CONTROLLERS
CET 2114C	DIGITAL SYSTEMS *
or CET 2113C	
CET 2123C	FUNDAMENTALS OF MICROPROCESSORS *
EET 2036C	PRINCIPLES OF ELECTRIC CIRCUITS *
or EET 1015C	FUNDAMENTALS OF DC CIRCUITS
or EET 1025C	FUNDAMENTALS OF AC CIRCUITS
or EET 2035C	ELECTRICAL CIRCUITS
EET 2141C	SEMICONDUCTOR DEVICES AND CIRCUITS *
EET 2325C	RF COMMUNICATION *
Electives: **	7
EET 2365C	WIRELESS AND DATA COMMUNICATIONS *
EET 2142C	INTEGRATED CIRCUITS *
ETS 2511C	ELECTROMECHANICAL SYSTEMS *
EET 2942	INTERNSHIP IN ELECTRONICS ENGINEERING TECHNOLOGY
EGN 2045	ENGINEERING AND TECHNOLOGY CALCULUS I *
or MAC 2311	CALCULUS WITH ANALYTIC GEOMETRY I
PHY 2053C	COLLEGE PHYSICS I WITH ALGEBRA *
or PHY 2048C	GENERAL PHYSICS WITH CALCULUS I

**Total Credit Hours** 31

\* This course has a prerequisite; check description in Valencia catalog.

\*\* Students are strongly advised to see their Career Program Advisor and/or the Program Chair of A.S. ECET before enrolling for any of the elective courses to satisfy the chosen program pathway.

## Basic Electronics Technician

**Technical Certificate**

This program is designed to prepare individuals for employment as electrical and electronics technicians, electronic testers or in related occupations in electronics. This program includes the basic electronics competencies as identified by the electronics industry as prerequisite for all technical programs. This program prepares individuals to assemble, install, operate, maintain, troubleshoot and repair basic electronic equipment used in industry. It also prepares students to enter advanced training and education in specialized electronics-related fields. The content includes, but is not limited to, DC and AC circuits and digital systems. Integrated into this content will be communication, leadership, human relations, and employability skills; safe and efficient work

practices; use of circuit diagrams and schematics; soldering; laboratory practices; and technical recording and reporting.

**Program Outcomes**

- Assist in the design, operation, and troubleshooting of technical systems

EET 1214C	INTRODUCTION TO ENGINEERING TECHNOLOGY *	3
MTB 1329	MATHEMATICS FOR ENGINEERING TECHNOLOGY	3
or MAC 1105	COLLEGE ALGEBRA	
or HIGHER		
CET 2114C	DIGITAL SYSTEMS *	3
or CET 2113C		
EET 2036C	PRINCIPLES OF ELECTRIC CIRCUITS *	3
or EET 1015C	FUNDAMENTALS OF DC CIRCUITS	
or EET 1025C	FUNDAMENTALS OF AC CIRCUITS	
or EET 2035C	ELECTRICAL CIRCUITS	
Any EET, ETS, or CET elective from A.S. ECET *		2

**Total Credit Hours** 14

\* This course has a prerequisite; check description in Valencia catalog.

**Notes:**

All certificate courses are offered on the West campus.

Specialized courses may not be offered every session or on every campus

## Laser and Photonics Technician

**Technical Certificate**

This program is designed to prepare individuals for employment as laser and optics technicians or in related occupations in laser and optics. This program includes the basic competencies as identified by the laser and optics industry. This program prepares individuals to assemble, install, operate, maintain, troubleshoot and repair basic laser and optical devices and equipment used in industry and prepares individuals to enter advanced training and education in specialized laser and optics-related fields. The content includes, but is not limited to, laser circuits, electro-optical devices and circuits. Integrated into this content will be communication, leadership, human relations, employability skills, safe and efficient work practices, use of circuit diagrams and schematics, laboratory practices, and technical recording and reporting.

**Program Outcomes**

- Assist in the design, operation, and troubleshooting of technical systems

Required:		9
MTB 1329	MATHEMATICS FOR ENGINEERING TECHNOLOGY *	
or MAC 1105 OR		
ETS 2210C	PRINCIPLES OF PHOTONICS *	
ETS 2230C	PRINCIPLES OF LASERS *	
or ETS 2215	GEOMETRIC OPTICS	
Electives: **		3

ETS 2220C	PRINCIPLES OF FIBER OPTICS COMMUNICATION *
ETS 2221C	ELECTRO-OPTICAL DEVICES *
ETS 1211C	INTRODUCTION TO PHOTONICS ENGINEERING DESIGN
ETS 2212	FOUNDATIONS OF PHOTONICS *
ETS 2212L	FOUNDATIONS OF PHOTONICS LABORATORY *
ETS 2215L	GEOMETRIC OPTICS LABORATORY *
<b>Total Credit Hours</b>	<b>12</b>

\* This course has a prerequisite; check description in Valencia catalog.

\*\*Students are strongly advised to see their Career Program Advisor and/or the Program Chair of A.S. ECET before enrolling in any of the elective courses to satisfy the chosen program pathway.

#### Note:

All certificate courses are offered on the West Campus.

Specialized courses may not be offered every session or on every campus.

## Robotics Applications Technician

### Technical Certificate

This program prepares individuals to install, maintain and troubleshoot general robot systems and simulators. Graduates of this technical program will be prepared to enter advanced training and education in specialized Robotics and Simulation related fields. The content includes, but is not limited to: Robotic Applications, Modeling and Simulation, and Virtual Reality Environment. Integrated into this program will be communications skills, leadership skills, human relations skills, employability skills, safe and efficient work practices, use of circuit diagrams and schematics, laboratory practices, and technical recording and reporting.

### Program Outcomes

- Assist in the design, operation, and troubleshooting of technical systems

EET 1214C	INTRODUCTION TO ENGINEERING TECHNOLOGY *	3
MTB 1329	MATHEMATICS FOR ENGINEERING TECHNOLOGY	3
or MAC 1105	COLLEGE ALGEBRA	
or HIGHER		
ETS 1603C	FUNDAMENTALS OF ROBOTICS AND SIMULATION *	3
ETS 2604C	ROBOTICS APPLICATIONS *	3
<b>Total Credit Hours</b>		<b>12</b>

\* This course has a prerequisite; check description in Valencia catalog.

#### Notes:

All certificate courses are offered on the West Campus.

Specialized courses may not be offered every session or on every campus.