

# EMBEDDED SYSTEMS TECHNICIAN, CERTIFICATE OF ACHIEVEMENT

**Control Number:** 41436  
**Not Financial Aid Eligible**

The Embedded Systems Technician Certificate is geared towards students who want to take their programming and circuit building skills to the next level. Students will become proficient in programming a variety of microcontrollers to perform tasks in an embedded application in C-based programming languages. Students who have obtained this certificate will be proficient at the use of multimeters and oscilloscopes to analyze circuit design and troubleshoot problems. Students will gain familiarity with digital communication protocols. This certificate is designed to teach students the skills necessary to build a career working with embedded electronics commonly found in consumer devices, IoT-connected devices, and autonomous vehicles.

Students earning this certificate are encouraged to continue their education by completing the additional requirements for the Associate of Science degree. They are also encouraged to pursue a bachelor's degree in an Electrical Engineering or Computer Science discipline. Students must complete the Robotics Technician Certificate of Achievement (12-13 units) as a prerequisite to entry into the Embedded Systems Technician program.

## Program Outcomes

1. Students will acquire skills necessary to program common microcontrollers using C.
2. Students will gain familiarity with different communication protocols to interface between electronic systems.
3. Students will be proficient at using multimeters, oscilloscopes, and spectrum analyzers to analyze circuits.
4. Students will acquire the skills necessary to methodically identify problems in circuits and propose solutions.

## Certificate of Achievement Requirements

The Certificate of Achievement is a state-approved career program that requires a minimum of eight units and is designed to prepare the graduate to enter a particular field of employment. In order to be awarded a certificate, students are required to obtain a grade of "C" or better in all program-required courses. Grades of "CR" or "P" will be accepted whereas "CR" or "P" meets the equivalency of a "C" or better. At least 3 units in an advanced course from the certificate must be completed at OCC at the department's discretion. Certificates of Achievement are not automatically awarded. A petition must be filed in Enrollment Services or online at the beginning of the semester in which the student will be completing their final requirements. The petitioning periods are listed in the Graduation Requirements (<https://catalog.cccd.edu/orange-coast/graduation-requirements/>) section of this catalog. Check with a counselor to determine the requirements for completion.

A list of certificate programs can be found in the Programs A-Z (<https://catalog.cccd.edu/orange-coast/programs-study/>) section of this catalog.

## Required Prerequisite

### Robotics Technician Certificate of Achievement (12-13 Units)

Course	Title	Units
<b>Required Courses</b>		
ELEC A100 or MATH A115 or MATH A120	Electronic Problem Solving College Algebra Trigonometry	3-4
ELEC A111	D.C. Circuits	3
ELEC A121	Robotics 1- Mechanics & Design	3
ELEC A122	Robotics 2- Sensors, Control Theory, and Programming	3
<b>Total Units</b>		<b>12-13</b>

## Required Courses

Course	Title	Units
ELEC A102	Safety, Maintenance, and Calibration	1
ELEC A103 or ELEC A290	Computer Hardware Configuration & Diagnostics Electronic Troubleshooting	3
ELEC A223	Embedded Control Systems	4
ELEC A224	Digital Communication Systems	3
<b>Required Course Units</b>		<b>11</b>

Requirement	Units
Required Prerequisites	12-13
Required Courses	11
<b>Total Units</b>	<b>23-24</b>

## Program Sequence

These sequences at Orange Coast College are curriculum maps for students to finish all requirements for the certificate. There may be advisories, prerequisites, or time requirements that students need to consider before following these maps. **Students are advised to meet with an Orange Coast College Counselor for alternate sequencing.**

Course	Title	Units
<b>Year 1</b>		
<b>Semester 1</b>		
ELEC A100 or MATH A115 or MATH A120	Electronic Problem Solving or College Algebra or Trigonometry	3-4
ELEC A111	D.C. Circuits	3
ELEC A121	Robotics 1- Mechanics & Design	3
ELEC A122	Robotics 2- Sensors, Control Theory, and Programming	3
	<b>Units</b>	<b>12-13</b>
<b>Semester 2</b>		
Spring Semester: Students must complete the Robotics Technician Certificate of Achievement (12-13 units) as a prerequisite to entry into the Embedded Systems Program.		
ELEC A223	Embedded Control Systems	4
ELEC A224	Digital Communication Systems	3
ELEC A102	Safety, Maintenance, and Calibration	1

2 Embedded Systems Technician, Certificate of Achievement

Course	Title	Units
ELEC A103 or ELEC A290	Computer Hardware Configuration & Diagnostics or Electronic Troubleshooting	3
<b>Units</b>		<b>11</b>
<b>Total Units</b>		<b>23-24</b>