

# LASER TECHNOLOGY - ASSOCIATE IN SCIENCE, CERTIFICATE OF ACHIEVEMENT

Top Code: 0934.80

Students completing the program in Laser Technology will learn the scientific principles of optics, fiber-optics, and lasers. Technicians will be instructed on the processes and equipment incorporating these devices in electronic and electro-optics systems. This training will prepare students to become technicians who work on products or devices in manufacturing, communications, defense, homeland security, medical, information technology, energy, environmental monitoring, lighting, displays, and entertainment. This program will prepare students for entry level employment as a photonics or photonics-related technician. This curriculum will first present a foundation of electronics curriculum core, which is critical to the success of the student in the optics/laser technology portion of the program and in general in the electro-optic industry. Along with gaining a strong electronics background, students will spend more than 40 percent of their time in the lab training on a variety of industrial lasers and optical systems to prepare the student for easy transition into the optical and laser technology work force. Completion of this course of study will provide students with the skills to work as a technician in the optics and laser support field. Students will have demonstrated knowledge in laser systems, electronics, optics and electro-optics. In particular, graduates will be prepared for a variety of careers in design and manufacturing, materials processing, communications, medical applications, semiconductor fabrication, optical systems, electronics, military applications, sales, and education.

A Certificate of Achievement is awarded upon completion of all required courses with a grade of C or better.

## Program Outcomes

1. Recognize and describe the purposes of different optical components and systems, including lenses, mirrors, prisms, windows, diffraction gratings, polarizers, waveplates, optical fibers, lasers, LEDs, detectors, cameras, and optoelectronics.
2. Demonstrate effective application of optical devices to generate, manipulate, and/or detect light.
3. Operate safely high-energy, high-voltage laser systems to comply with ANSI and OSHA standards required in industrial laboratory environments.
4. Apply the quality assurance (QA) practices required to inspect optical components to ISO10110 drawing standards and/or military specifications (MIL SPECS), and measure their performance using the industrial tools of an optics fabrication shop.
5. Perform the technical tasks required to characterize of a precision optical system, such as the measurement of a system's transmitted wavefront error or its performance in the creation of high-resolution images.
6. Integrate relevant electronic components into laser optical systems.
7. Communicate technical ideas, procedures, and results with professionals in written, oral or graphic format.

## Requirements for the Certificate of Achievement

Code	Title	Units
LASR 215	FUNDAMENTALS OF LIGHT AND LASERS	3
LASR 230	INTRODUCTION TO OPTICAL DEVICES	3
LASR 245	QUALITY ASSURANCE OF PRECISION OPTICS	4
LASR 260	METROLOGY OF OPTICAL SYSTEMS	3
ELTN 130	INTRODUCTION TO ELECTRONICS	3
<b>Required Electives</b>		
ELTN 117	INTRODUCTION TO MICROCONTROLLERS AND EMBEDDED DESIGN	3
or ELTN 131	ANALOG DEVICES AND CIRCUITS	
<b>Total Units</b>		<b>19</b>

## General Education Requirements for the Associate in Science Degree

- General Information (<https://curriculum.pasadena.edu/academic-programs-leading-degree-certificate/>)
- PCC Local Gen Ed (<https://curriculum.pasadena.edu/academic-programs-leading-degree-certificate/#pcclocaltext>)
- CSU Breadth (<https://curriculum.pasadena.edu/academic-programs-leading-degree-certificate/#csubreadthtext>)
- IGETC (<https://curriculum.pasadena.edu/academic-programs-leading-degree-certificate/#igetctext>)