LASER TECHNOLOGY – ASSOCIATE IN SCIENCE, CERTIFICATE OF ACHIEVEMENT

Top Code:

0934.80

Students completing the Laser Technology program will learn the scientific principles of light, including the use of precision optics, fiber optics, lasers, cameras, and other equipment that creates or detects light. Students will also be offered an introduction to principles of electronic devices and circuits. Students will be taught the skills required of competent industry technicians, such as the processes required to align an optical beam, or use of the equipment involved in measurement of optical properties. This program prepares students for entry-level employment as a technician in fields that use optical or laser-based technology, such as aerospace, medicine, remote sensing and environmental monitoring, energy, manufacturing, defense and homeland security, telecommunications, or entertainment.

Students will spend more than 40 percent of their time in a laboratory environment that mimics that of an industrial lab. There, they will train to use a variety of optical components and systems, including lasers and cameras. Since optical hardware is ubiquitous in technical devices and systems, this training prepares the student for a seamless transition into the technical work force of many industries. Only fundamental high school-level mathematics are required for enrollment, particularly trigonometry and geometry. Graduates will be prepared for a variety of demanding applied careers, such as assembly and test technician, laser-process technologist, sales and marketing specialist, field service technician, manufacturing technical specialist, and technical education. This challenging work may include longer hours that come with overtime pay and full benefits. Exposure to high-voltage and high-energy sources may be involved in this work, so safety training is a key aspect of this education. Many of these hands-on skills are used in industry by aerospace, electrical, mechanical, and optical engineers, but they are not often taught at universities, even as part of an ABET-accredited engineering degree, so graduates gain an advantage on the job or in subsequent academic work when hardware work is involved.

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

Program Outcomes

- Recognize and describe the purposes of optical components and systems, including lenses, mirrors, prisms, windows, diffraction gratings, polarizers, waveplates, optical fibers, lasers, LEDs, detectors, cameras, and optoelectronics.
- Demonstrate effective application of optical devices to generate, manipulate, and/or detect light.
- Operate safely laser systems to comply with ANSI and OSHA standards required in industrial laboratory environments.
- Apply the quality assurance (QA) practices required to inspect optical components to ISO 10110 drawing standards and/or military specifications (MIL SPECS).
- Measure the performance of optical components using the industrial tools of an optics fabrication shop.
- Perform the technical tasks required to characterize the performance of a precision optical system, such as the measurement of a system's imaging performance or transmitted wavefront error.
- Create conceptual and physical connections between optical and electronic components.

Requirements for the Certificate of Achievement

Code	Title	Units
LASR 215	FUNDAMENTALS OF LIGHT AND LASERS	3
LASR 230	OPTICAL DEVICES	3
LASR 245	QUALITY ASSURANCE OF PRECISION OPTICS	3
LASR 260	METROLOGY OF OPTICAL SYSTEMS	3
ELTN 130	INTRODUCTION TO ELECTRONICS	3
Required Electives		
ELTN 117	INTRODUCTION TO MICROCONTROLLERS AND EMBEDDED DESIGN	3
or ELTN 131	ANALOG DEVICES AND CIRCUITS	
Total Units		**18**

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)