

PROGRAM ALL FIELDS REPORT

Basic Program Information

Program Title	Photonics and Laser Technology
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Discipline	PALT
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Award Type	Certificate of Achievement
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Justification for Proposal	<p>Silicon Valley is home to global leaders in the manufacturing of photonics and laser technology products. For example Coherent Optics, Spectra Physics and many other small and large firms in Silicon Valley produce a variety of critical optics and photonics hardware like solid state lighting, lasers, lenses, coatings, etc. that are found in virtually every high-tech device we use. The industry has been severely handicapped due to the lack of a United States program that can train technicians to work in the photonics and laser industry. Silicon Valley industry has successfully collaborated on a program with San Jose City College to create a laser technician program. But the severe shortage in optics and photonics technicians and engineers continues to be a huge challenge to them. An annual need of upwards of nearly 200 trained optics and photonics engineers, technicians and specialists is typically forecasted but has been impossible to fill. Thus far, industry has been carrying out the training themselves and this has lead to increased cost and lower productivity. For these reasons, industry leaders have approached Cañada College to create a Photonics and Laser Technician CA program.</p>
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Career Opportunities	<p>Rapid growth in the number and complexity of photonics and photonics-enabled technologies has caused the demand for technicians to exceed supply. There are more than a dozen fields that utilize Photonics enabled technologies. Some example include: aerospace technology (LiDAR system), manufacturing (laser welding, drilling and 3D printing), construction (site topography, materials inventory, distance measuring and alignment, three-dimensional analysis to track the progress of construction), transportation (monitoring exhaust emissions, navigation with optical gyroscopes) and environmental technology (monitoring air quality and particulate emission from exhaust stacks). The primary occupations for students skilled in basic photonics and laser technology relates to middle-skill jobs in operation and maintenance of optics and photonics equipment and technology involving titles like Mechanical Technicians, Technical Associate, Manufacturing, Thin Film Technician and Calibration Technology Specialist.</p>
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Description

Program Description	<p>This program provides foundational hands-on skills and training in industry-relevant science and engineering principles of the field of photonics and laser technology (PALT). PALT is involved with the generation and harnessing of light and other forms of radiant energy. Photonics involves state-of-art use and applications of lasers, optics, fiber-optics, and electro-optical devices in diverse fields of technology – alternate energy, manufacturing, health care, telecommunication, environmental monitoring, homeland security, aerospace, solid state lighting, and many others. The applications of photonics and lasers in creating and enabling technologies are extremely broad. From an educational standpoint, this means that photonics courses in a postsecondary college curriculum in related technologies can qualify graduates for a far wider variety of jobs and increase the global competitiveness of the workforce.</p>
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Program Learning Outcomes/Assessments
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A. Apply knowledge of math, science, and engineering to identify, formulate, and solve optics and photonics problems.

Assessment: • Apply knowledge of math, science, and engineering to identify, formulate, and solve optics and photonics problems. • Assessment Methods 1. Quiz, homeworks and exams 2. Peer-to-peer and group discussions

B. Communicate effectively and work well in situations that require teamwork.

Assessment: • Communicate effectively and work well in situations that require teamwork. ? Assessment Methods 1. Work in teams to successfully complete laboratory work. 2. Work in teams to record, analyze and graphically present laboratory work. 3. Work in teams to prepare technical document reporting on lab work 4. Work in teams to prepare oral and/or poster presentations.

C. Design and perform tests or experiments, analyze and interpret data, and prepare a report summarizing the results of the tests or experiments.

Assessment: • Design and perform tests or experiments, analyze and interpret data, and prepare a report summarizing the results of the tests or experiments. ? Assessment Methods ? Work individually or in a team to complete engineering design project involving computer modeling or laboratory work. ? Work individually or in a team to prepare technical document reporting on design project.

D. Use techniques, skills, and modern engineering and computer tools necessary for optics and photonics engineering practice.

Assessment: • Use techniques, skills, and modern engineering and computer tools necessary for optics and photonics engineering practice. • Assessment Methods 1. Quiz, homeworks and exams 2. Peer-to-peer and group discussions 3. Completion of laboratory experiments 4. Completion of specialized optics and photonics software tools (like MATLAB and ZEMAX

Conditions of Enrollment

Courses

Major: Core Requirements	
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Complete Core Courses, 18 units	
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PALT 401	Introduction to Photonics and Laser Technology	2
PALT 402	Geometrical Optics	4
PALT 403	Optics and Photonics Modeling and Design	3
PALT 404	Wave Optics	4
PALT 405	Introduction to Laser Technology	3
PALT 406	Components and Devices in Photonics and Laser Technology	2

Total Units	18
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Codes/Dates

State Approval Date	
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CC Approval Date	01/22/2021
Board of Trustees	
Display CurricUNET Calculations	No
Effective Term	Fall 2021
TOP Code	
Originator	Ramki Kalyanaraman
Origination Date	10/19/2020
Comments	
Need For Change	<p>Silicon Valley is home to global leaders in the manufacturing of photonics and laser technology products. For example Coherent Optics, Spectra Physics and many other small and large firms in Silicon Valley produce a variety of critical optics and photonics hardware like solid state lighting, lasers, lenses, coatings, etc. that are found in virtually every high-tech device we use. The industry has been severely handicapped due to the lack of a United States program that can train technicians to work in the photonics and laser industry. Silicon Valley industry has successfully collaborated on a program with San Jose City College to create a laser technician program. But the severe shortage in optics and photonics technicians and engineers continues to be a huge challenge to them. An annual need of upwards of nearly 200 trained optics and photonics engineers, technicians and specialists is typically forecasted but has been impossible to fill. Thus far, industry has been carrying out the training themselves and this has lead to increased cost and lower productivity. For these reasons, industry leaders have approached Cañada College to create a Photonics and Laser Technician CA program.</p>
Proposal Type	Cañada New Program
Academic Year	