

All Fields Report

Basic Course Information	
College	Cañada College
Discipline	PALT-Photonics and Laser Technology
Course Number	406
Full Course Title	Components and Devices in Photonics and Laser Technology
Catalog Course Description	An introductory review of basic components and devices that make up optics and photonics systems. Topics include: polarizers and filters; non-laser light sources; light detectors; light modulators; selection of appropriate optical device for a desired application.
Class Schedule Course Description	An introductory review of basic components and devices that make up optics and photonics systems. Topics include: polarizers and filters; non-laser light sources; light detectors; light modulators; selection of appropriate optical device for a desired application.
Proposal Information	
Proposed Start	Year: 2021 Semester: Fall
Proposed Curriculum Committee Meeting Date:	01/22/2021
Deadline for submission to Dean's Queue:	12/17/2020
Deadline for submission of curriculum proposal to the Technical Review Committee:	12/29/2020
Proposal Origination Date:	10/13/2020
Justification For Board Report OR Curriculum Inventory update:	<p>1. For NEW Courses: Provide a brief justification statement describing the need for the course, its place in the curriculum, and pertinent information such as the role of advisory committees. New courses require approval of the SMCCCD Board of Trustees. The justification statement will be included on the annual Curricular Board report. Use complete sentences and present tense.</p> <p>2. For all types of Course MODIFICATIONS (modifications, banking, deletions and reactivations): Provide a brief justification statement describing the need for the change. The justification statement will be used for course updates in the State Curriculum Inventory as necessary. Use complete sentences and present tense.</p> <p>The course content is recommended by the Advisory Board. It provides students with an overview of important optical components that are used in modern photonics and laser systems and processes. This course is a core requirement for the Certificate of Achievements in Photonics and Laser Technology and in Advanced Photonics and Laser Technology.</p>
Honors Course	No
Open Entry/Open Exit	No 0

Equivalent Courses	
Will this course replace an existing course in the catalog, or an experimental course?	No
If yes, identify and explain.	

Similar Courses

Is there a similar or equivalent course in SMCCCD?	No
Added Similar Courses	

Units/Hours

Unit Types	Fixed
Units	Min: 2.00
Variable Range	Range (or)

Hours

Please enter hours as per term values

Method	Min Hours	Max Hours	Min Faculty Load	Min Units
Lecture	32.00	36.00	2.00	2.00
Lab	0.00	0.00	0.00	0.00
TBA	0.00	0.00	0.00	0.00
Work Experience	0.00	0.00	0.00	0.00
Field Experience	0.00	0.00	0.00	0.00
Other	0.00	0.00	0.00	0.00
Homework	64.00	72.00	0.00	0.00

Other Hours

Course Details

Repeatable for Credit	No
Grading Methods	Letter Grade Only
Audit	Yes

Materials Fee

Fee Required?	No
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Student Learning Outcomes

Upon successful completion of this course, a student will meet the following outcomes:

1. Select a polarizer to achieve desired light output.
2. Select appropriate windows to protect systems.
3. Select optical filters to achieve a specified wavelength or wavelength range.
4. Use an optical filter to measure the wavelength range of light.
5. Select appropriate light source for spectroscopy, lighting and other applications.
6. Select a detector for light detection and power measurement.

Course Objectives

Upon successful completion of this course, a student will be able to:

1. Differentiate between types or polarizers and materials they are made from.
2. Learn about different types of optical windows for use in vacuum, high-pressure and other environments.
3. Explore the basis for the various types of optical filters.
4. Learn about the many different sources of non-laser light and their underlying principles.

5. Learn the principles of the basic types of light detectors and light modulators.

Course Lecture Content

1. Lenses
 1. Materials
 2. Magnifiers
 3. Cameras
2. Mirrors
 1. Spherical
 2. Ellipsoidal
 3. Aberrations
3. Diffraction gratings
 1. Holographic
 2. Multilayer dielectric
4. Polarizers
 1. Birefringent
 2. Reflective
 3. Linear polarizers
 4. Circular polarizers
5. Windows
 1. UV and AR coating materials
 2. Vis and NIR Windows
6. Filters
 1. Neutral density
 2. Raman
 3. Dielectric
7. Beamsplitters
 1. Plate
 2. Cube
 3. Pellicle
8. Non-laser Light Sources
 1. Thermal Sources
 2. Gas-Discharge lamps
 3. Light emitting diodes
9. Light Detectors
 1. Thermal
 2. Photodetectors
10. Light Modulators Acusto-optic Modulators
 1. Electro-optic devices
 2. Beam Scanners

Course Lab Content

TBA Hours Content

Frequently Recommended Preparation

Frequently Recommended

Justification for Frequently Recommended Preparation

Why is the knowledge of the recommended course(s), skill(s) or information necessary for students to succeed in the

"target" course? Specify the relationship between the recommended knowledge and skills required of students and those taught in the "target course? (Please list the specific proficiencies students must possess in order to succeed in the "target" course.)

Other Recommended Preparation

You have no defined requisites.

Prerequisites/Corequisites

Drag and Drop to Reorder

Edit/Delete	Requisites	Analysis
	Corequisite Completion of, or concurrent enrollment in	
	Corequisite PALT 404	

Content Review

PALT 404 - Corequisite
(Objective to Objective)
Launched

Mode of Delivery

Modes of Delivery

Online
Hybrid
Lecture

Representative Instructional Methods

Methods	Lecture Discussion Guest Speakers Other (Specify)
Other Methods	The course will be supplemented by technology and by video and/or Web-based content as appropriate.

Representative Assignments

Writing Assignments

(List all assignments, including library assignments. Outside assignments are not required for lab-only courses, although they can be given.)

- Weekly submission of analysis of optical components (1-3 pages in length).

Reading Assignments

(List all assignments, including library assignments. Outside assignments are not required for lab-only courses, although they can be given.)

- Weekly textbook readings (30 pages).

Other Outside Assignments

(List all assignments, including library assignments. Outside assignments are not required for lab-only courses, although they can be given.)

- Out of class assignments will be in keeping with the goals and objectives of the course. The use of critical thinking is required for the students to apply the principles of optics to photonics and laser technology. Students are expected to complete a minimum of two hours of outside assignments for each hour of classroom lecture.

To be Arranged Assignments

(List all assignments, including library assignments. Outside assignments are not required for lab-only courses, although they can be given.)

- Not applicable

Representative Methods of Evaluation

This section defines the ways students will demonstrate that they have met the student learning outcomes.

Student grades will be based on multiple measures of student performance. Instructors will develop appropriate classroom assessment methods and procedures for calculating student grades, including the final semester grade. The following list displays typical assessment methods appropriate for this course. The actual assessment methods used in a particular classroom and section will be listed in the instructor's syllabus.

Methods must effectively evaluate critical thinking. Credit courses must include written communication, problem solving, and/or skills demonstrations.

Multiple measures may include, but are not limited to, the following:

Methods

- Exams/Tests
- Quizzes
- Written examination

Representative Texts

Textbooks such as the following are appropriate:

Formatting Style

APA

Textbooks

1. Aggarwal, R.L., Alavi, K.. *Introduction to Optical Components*, ed. Taylor and Francis Group, CRC press, 2018

Manuals

You have no manuals defined.

Periodicals

You have no periodicals defined.

Software

You have no software defined.

Other

You have no other defined.

Degree/Certificate Applicability

Designation	Degree Credit
Proposed For	Certificate/Skill Award
Course Designation Text	Are there degrees/certificates to which this course applies? 1. CA in Photonics and Laser Technology 2. CA in Advanced Photonics and Laser Technology

General Education/Degree/Transfer Course

Page Last Saved on Friday, Oct 30, 2020 at 2:38 PM
By Ramki Kalyanaraman

CSU Transfer Course

Transfers to CSU Approved

Course Distance Education

Distance Ed Supplement	New distance education supplement
Distance Education	Distance education component was developed by an instructor with training in online pedagogy. Training: Canada college QOTL training in summer of 2020
Method of Distance Education	Online, Hybrid, Web Assisted Course; (If there are limitations on how this course would be offered please explain below)
Online Method Limitations	
Other Methods	
Course Content and Methodology	The objectives and content of the course are adequately covered by the methods of instruction, assignments, evaluation of student outcomes, and instructional materials.
Instructional Methodologies (How will you deliver the course content?):	Announcements/Bulletin Boards E-mail One-Way Video Conferencing (One-way interactive video and two-way interactive audio) Online Presentations Resource Links Two-Way Video conferencing (Two-way interactive video and audio)
Representative Courseware/Textbooks Materials:	Possible textbooks include: Aggarwal, R.L., Alavi, K.. Introduction to Optical Components, ed.Taylor and Francis Group, CRC press, 2018
Methods of Evaluation of Student Performance:	Weekly Homework submitted electronically Biweekly Quiz submitted electronically Monthly test or exam conducted electronically
How are you ensuring that students with disabilities can access your course in accordance with Section 508?	Instructional materials have been tagged to indicate organizational structure and reading order. Images, tables and/or diagrams include textual representations. If applicable, the instructor will ask the publisher or content provider to provide a Voluntary Product Accessibility Template (VPAT) which evaluates how accessible the product is according to section 508 standards.

Plan for Regular Effective Communication Contact Between Faculty and Student (Title 5, 55204). "Local policies should establish and monitor minimum standards of regular effective contact."

Announcements/Bulletin Boards - At least twice a week course related information will be sent to students.

Email Communication - Response by email within 24-48 hours

Office hours - Weekly office hours held via video or phone call

Resources Needed

Adequate Library Resources	Consultation with the Coordinator of Library Services regarding the adequacy of campus and online information resources to fulfill course objectives is required prior to course approval. Inadequate to support the course Please Specify:
Affected Resources	Which of the following resources do you expect to be affected by the offering of this class? Check as many as appropriate.
	None of the above
Explain what effect the areas you have checked will have upon this college:	

Comparable Transfer Course Information

Are there comparable courses?	Yes
Edit/Del	College Info

Minimum Qualification

No Minimum Qualifications For this Course

CB Codes

CB03 TOP Code	0934.80 - Laser and Optical Technol
CB04 Course Credit Status	D - Credit - Degree Applicable
CB05 Course Transfer Status	B = Transferable to CSU only
CB08 Course Basic Skill Status (PBS Status)	2N = Course is not a basic skills course.
CB09 SAM Code	C - Occupational
CB11 California Classification Codes	Y - Credit Course
CB21 Levels Below Transfer	Y = Not Applicable
CB23 Funding Agency Category	A = Fully Economic Development funds

CB25 Course General Education Status	Y - Not Applicable
CB26 Course Support Course Status	N - Course is not a support course

Codes/Dates

Entry of Special Dates

Instruction Office Review	01/22/2021
Last Outline Revision	
Content Review	01/22/2021
CC Approval	01/22/2021
DE Approval	01/22/2021
Effective Term	Term: Fall Year: 2021

Web Catalog

Course Family	
Web Catalog	<input type="checkbox"/> Exclude from Web Catalog

Instructional Services

Implementation Date	
Originator	Ramki Kalyanaraman
Origination Date	10/13/2020
Proposal Type	Cañada New Course
C-ID Numbers	
CB00 State ID	
CB03 TOP Code	0934.80 - Laser and Optical Technol
CB04 Course Credit Status	D - Credit - Degree Applicable
CB05 Course Transfer Status	B = Transferable to CSU only
CB08 Course Basic Skill Status (PBS Status)	2N = Course is not a basic skills course.
CB09 SAM Code	C - Occupational
CB10 Course COOP Work Exp-ED	N = Not part of Coop Work Exp
CB11 California Classification Codes	Y - Credit Course
CB13-Special Class Status	N - Not Special
CB21 Levels Below Transfer	Y = Not Applicable
CB22 Non Credit Course Category	Y - Not Applicable
CB23 Funding Agency Category	A = Fully Economic Development funds
CB24-Program Course Status	1 = Program Applicable
CB25 Course General Education Status	Y - Not Applicable
CB26 Course Support Course Status	N - Course is not a support course

Web Catalog Metadata