



UNIVERSITY OF
CENTRAL FLORIDA

OSE 5041 - Introduction to Wave Optics

Section: 0001

Optics and Photonics

Course Information

Term: Spring 2026

Class Meeting Days: TR

Class Meeting Time: 04:30PM - 05:45PM

Class Meeting Location: CROLA214

Modality: P

Credit Hours: 3.00

Instructor Information

Name: Pieter Kik

Office Location: CREOL A220

Office Hours

T/R 6pm-7pm

Email: kik@creol.ucf.edu

Course Description

OSE 5041 OPT-OPT 3(3,0)Introduction to Wave Optics: PR: EEL 4440 or PHY 4424 or C.I. Electromagnetic foundation of light waves as applied to reflection, diffraction, interference, polarization, coherence, and guided waves. Occasional.

This course is intended for the first-year master students and advanced senior undergraduate students, who would like to learn the basic properties of light, electromagnetic theory, the propagation of light, such as scattering, refraction and reflection, image formation, polarization, interference, and diffraction. To illustrate the practical application of several of the covered concepts, the optical elements in virtual reality and augmented reality systems will be discussed.

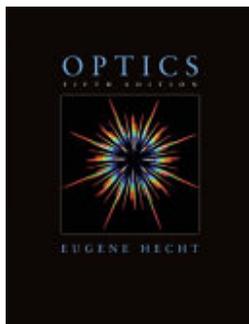
Topics covered include

- Wave motion
- Electromagnetic theory
- The propagation of light
- The superposition of waves
- Polarization
- Interference
- Diffraction
- Augmented reality and virtual reality

Student Learning Outcomes

Upon completion of this course, students will understand the basic principles of wave optics. They should will understand the role of the wave-nature of light in phenomena and applications including optical refraction, imaging, beam focusing, waveguides, optical fibers, wave plates, anti-reflection coatings, interferometers, and grating spectrometers.

Required Course Materials and Resources



Optics

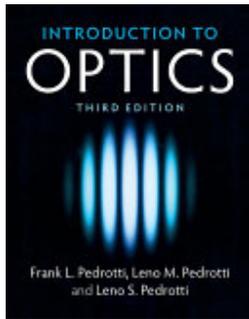
ISBN: 9780133977226

Authors: Eugene Hecht

Publisher: Pearson

Publication Date: 2017-01-01

Recommended Course Materials



Title: Introduction to Optics

ISBN: 9781108428262

Authors: Frank L. Pedrotti, Leno M. Pedrotti, Leno S. Pedrotti

Publisher: Cambridge University Press

Publication Date: 2018-01-01

Course Assessment and Grading Procedure

Assessment	Percent of final grade
Homework (weekly)	20
Midterm Exam	35
Final Exam	45
Total	100

Grading Scale

Letter Grade	Percentage
A	94-100%
A-	90-93%
B+	87-89%
B	84-86%
B-	80-83%
C+	77-79%
C	74-76%
C-	70-73%
D+	67-69%
D	64-66%
D-	61-63%
F	0-60%

Policies for Course Grade

Makeup Work Policy

If an emergency arises and a student cannot take an exam on the scheduled date, the student must give notification to the instructor no less than 24 hours before the scheduled time. The instructor will specify a new date for taking the exam. Any illness will be considered a medical emergency only if an official Doctor's note confirming the illness is submitted to the CREOL Graduate Office.

Missed/Late Assignments

Missed or Late assignments without prior consent from the instructor will not receive credit. An extension of the submission deadline may be granted at the discretion of the instructor if the following criteria are met:

- The extension request was sent before the original submission deadline.
- The student provided a plausible excuse for the delayed submission.
- The student provided a reasonable updated submission deadline.

Grade Objections

All objections to grades should be made in writing within one week of the work in question. Objections made after this period has elapsed will not be considered.

Artificial Intelligence (AI) Use Policy

All assignments must be carried out by the students. Verbatim copying of answers provided by AI (LLM's) is not allowed. Use of AI for clarification of concepts is encouraged, provided that students are aware that LLMs confabulate (make things up) and that AI responses could include topics that are not part of the course.

Disability Access & Accommodations

The University of Central Florida is committed to providing equal access to all students with disabilities (ADHD, learning disabilities, Autism, chronic medical conditions, physical disabilities, etc.). To receive consideration for reasonable

disability-related course accommodations, disabled students must contact Student Accessibility Services (SAS) and complete the steps required for SAS to review accommodation requests. More information can be found on the UCF [Student Accessibility Services](#) website under the Start Here tab or by contacting SAS directly (Ferrell Commons 185; sas@ucf.edu; Phone - 407-823-2371).

Approved accommodations are shared with course instructors via the SAS Course Accessibility Letter. Implementing certain accommodations may require discussion about specific considerations of the course design, course learning objectives, and the individual academic and course challenges experienced by the student. While students with disabilities or chronic health needs are also encouraged to discuss any course concerns with professors in addition to contacting SAS, professors are not required to facilitate disability-related adjustments to the course unless the professor has received a Course Accessibility Letter from SAS that outlines approved accommodations.

Academic Integrity

Students should familiarize themselves with UCF's Code of Conduct at Student Conduct and Integrity Office. According to Section 1, "Academic Misconduct," students are prohibited from engaging in:

1. Academic misconduct is defined as any submitted work or behavior that obstructs the instructor of record's ability to accurately assess the student's understanding or completion of course materials or degree requirements (e.g., assignment, quiz, and/or exam). Examples of academic misconduct include but are not limited to: plagiarism, unauthorized assistance to complete an academic exercise; unauthorized communication with others during an examination, course assessment, or project; falsifying or misrepresenting academic work; providing misleading information to create a personal advantage to complete course/degree requirements; or multiple submission(s) of academic work without permission of the instructor of record.
2. Any student who knowingly helps another violate academic behavior standards is also in violation of the standards.
3. Commercial Use of Academic Material. Selling of course material to another person and/or uploading course material to a third-party vendor without

authorization or without the express permission of the University and the instructor of record. Course materials include but are not limited to class notes, the instructor of record's slide deck, tests, quizzes, labs, instruction sheets, homework, study guides, and handouts.

4. Soliciting assistance with academic coursework and/or degree requirements. The solicitation of assistance with an assignment, lab, quiz, test, paper, etc., without authorization of the instructor of record or designee is prohibited. This includes but is not limited to asking for answers to a quiz, trading answers, or offering to pay another to complete an assignment. It is considered Academic Misconduct to solicit assistance with academic coursework and/or degree requirements, even if the solicitation did not yield actual assistance (for example, if there was no response to the solicitation).

Responses to Academic Dishonesty, Plagiarism, or Cheating

Students should also familiarize themselves with the procedures for academic misconduct in UCF's student handbook, [The Golden Rule](#). UCF faculty members have a responsibility for students' education and the value of a UCF degree, and so seek to prevent unethical behavior and respond to academic misconduct when necessary. Penalties for violating rules, policies, and instructions within this course can range from a zero on the exercise to an "F" letter grade in the course. In addition, an Academic Misconduct report could be filed with the Office of Student Conduct and Academic Integrity, which could lead to disciplinary warning, disciplinary probation, or deferred suspension or separation from the University through suspension, dismissal, or expulsion with the addition of a "Z" designated on one's transcript.

Being found in violation of academic conduct standards could result in a student having to disclose such behavior on a graduate school application, being removed from a leadership position within a student organization, the recipient of scholarships, participation in University activities such as study abroad, internships, etc.

Let's avoid all of this by demonstrating values of honesty, trust, and integrity. No grade is worth compromising your integrity and moving your moral compass. Stay true to doing the right thing: take the zero, not a shortcut.

Title IX

Title IX prohibits sex discrimination, including sexual misconduct, sexual violence, sexual harassment, and retaliation. If you or someone you know has been harassed or assaulted, you can find resources available to support the victim, including confidential resources and information concerning reporting options at [Let's Be Clear](#) and [UCF Cares](#).

For more information on access and community engagement, Title IX, accessibility, or UCF's complaint processes contact:

- Title IX – ONAC – [Office of Nondiscrimination & Accommodations Compliance](#) & askanadvocate@ucf.edu
- Disability Accommodation – Student Accessibility Services – [Student Accessibility Services](#) & sas@ucf.edu
- [Access and Community Engagement](#) (including the Ginsberg Center for Inclusion and Community Engagement, Military and Veteran Student Success, and HSI Initiatives)
- UCF Compliance and Ethics Office – [Compliance, Ethics, and Risk Office](#) & complianceandethics@ucf.edu
- The [Ombuds Office](#) is a safe place to discuss concerns.

Reporting an Incident or Issue

If you believe you have experienced discrimination by any faculty or staff member, contact the Office of Nondiscrimination & Accommodations Compliance via the [ONAC website](#) or at 407-823-1336. You can also choose to report using the UCF Integrity Line either anonymously or as yourself at 1-855-877-6049 or by using the [online form](#). UCF cares about you and takes every report seriously. For more information see the [Reporting an Incident or Issue Webpage](#).

Deployed Active-Duty Military Students

Students who are deployed active-duty military and/or National Guard personnel and require accommodation should contact their instructors as soon as possible after the semester begins and/or after they receive notification of deployment to make arrangements.

Campus Safety

At UCF's Public Safety and Police, safety is the top priority. Emergencies on campus are rare, but if one should arise, it's important to be familiar with some basic safety and security concepts.

- In an emergency, always dial 911.
- Every UCF Classroom has an Emergency Procedure Guide posted on a wall near the door, which will show you how to respond to a variety of situations. This guide can also be found online [here](#).
- In the event of an active threat, remember **AVOID, DENY, DEFEND**. Choose the best course of action and act immediately. Watch the video [here](#) to learn more.
 - **AVOID**. Pay attention to your surroundings and have an exit plan. Get as much distance and as many barriers between you and the threat as quickly as possible.
 - **DENY**. When avoiding is difficult or impossible, deny the threat access to you and your space. Lockdown by creating barriers, turning the lights off and remaining quiet and out of sight. Make sure your phone is silenced, but do not turn it off.
 - **DEFEND**. When you are unable to put distance between yourself and the threat, be prepared to protect yourself. Commit to your actions, be aggressive and do not fight fairly. Do whatever it takes to survive.
- For emergencies on campus, UCF will utilize the [UCF Alert](#) system. All UCF students, faculty, and staff are automatically enrolled to receive these email and text alerts, however, it's a good idea to frequently ensure your [contact information is up to date](#).

Financial Aid Accountability

All instructors are required to document students' academic activity at the beginning of each course. In order to document that you began this course, please complete this activity by the end of the first week of classes or as soon as possible after adding the course. Failure to do so may result in a delay in the disbursement of your financial aid.

Class Schedule

Topic number	Topic
1	Harmonic Waves, Phase, Superposition, Complex waves
2	Phasors, wave addition, plane/cylindrical/spherical waves
3	Electromagnetic waves, energy, irradiance
4	Wave propagation in materials, light spectrum, colors
5	Concept of scattering, reflection, transmission
6	Electromagnetic boundary conditions, Snell's law, Total internal reflection
7	Redirecting light waves - lenses
8	Redirecting light waves - mirrors
9	Addition of waves with same frequency; wavepackets, pulse trains
10	Coherence; Light sources (incandescent, light emitting diodes, lasers)
11	Prisms, fiber optics
	Polarized light; linear, circular, elliptical, random polarization; dichroism,
12	birefringence
13	Polarizers, quarter wave plates, half wave plates
14	Interference; Young's Double Slit experiment
15	Thin-film interference
16	Interferometers
17	Multiple-beam interference; etalon, Fabry-Perot cavity
18	Diffraction from 1D apertures
19	Diffraction from 2D apertures
20	Diffraction from multiple apertures; gratings
21	Fresnel diffraction