



UNIVERSITY OF
CENTRAL FLORIDA

OSE 3200L - GEOMETRIC OPTICS

LAB

Section: 0001

Optics and Photonics

Course Information

Term: Fall 2024

Class Meeting Days: R

Class Meeting Time: 08:30 - 11:20

Class Meeting Location: CROL A210

Modality: P

Credit Hours: 1.00

Instructor Information

Xiaoming Yu

Office Location: A337

Office Hours:

Open Door or by Appointment

Email: yux@creol.ucf.edu

Teaching Assistants

Punith Lokesh (punith.chikkahallilokesh@ucf.edu)

Course Description

OSE 3200L OPTIC 1(0,3)Geometric Optics Lab: PR/CR: OSE 3200 Light as rays. Reflection, refraction, transmission. Lenses, mirrors, prisms. Image formation, beam

manipulation. Measure and characterize optical systems including telescopes, cameras, and microscopes. Fall

Geometric optics is the study of light in its simplest form by treating light as rays. Light rays travel in straight lines until they encounter an interface (such as a mirror or a lens) where they may be redirected by reflection and refraction. This course provides hand-on experience working with light-sources, manipulating light and assembling optical systems. Labs explore the classical, ray behavior of light to describe behavior at interfaces and propagation through systems. This course provides practical experience working with optics in a laboratory environment including experience handling optics, assembling optomechanical components, conducting experiments and performing data analysis.

Student Learning Outcomes

Upon completion of this course, students should understand the physical principles underlying geometrical optics and develop intuitive understanding of optical systems. They should understand how light propagates through optical systems and how to design/build simple systems. They should be able to characterize properties of common optical systems such as telescopes, imagers, luminaires and concentrators. For example, students should be able to:

- Choose optics to manipulate light sources to achieve a desired effect.
- Assemble an optical system.
- Characterize the properties of various optical systems.
- Design an imaging system with a desired resolution, field-of-view and magnification.
- Understand limitations in optical system performance.

Course Materials and Resources

No Required Material

Recommended Course Materials

Title: Geometrical and Trigonometric Optics

Authors: E. L. Dereniak, and T. D. Dereniak

Publisher: Cambridge University Press

Publication Date: 2008

Edition: 1st

Online Access: <https://www.cambridge.org/core/books/geometrical-and-trigonometric-optics/41792CC511FABC71B070C0747CBB42D0>

Course Assessment and Grading Procedure

Final grade is calculated as follows:

Criteria	Grade Weighting
Attendance	20%
10 lab reports (short)	60%
One formal lab report (long)	20%
Total	100%

When you turn in your work, you should have answered all questions in a neat and clear manner.

- You should also be sure that your informal notes, experimental setup sketches table and plots are clear.
- Make sure you have taken and reported all required data and presented in in the manner asked for. If you choose to present the data in additional ways then you can do so, but you should state why. Be sure that all your error analysis is complete where appropriate.
- Explicitly answer all questions asked about the data, experimental method, etc.
- Ensure that you fully answered all of the discussion and analysis questions at the end of each lab exercise. While your answer should have depth, they should also be concise – do not try to use long sentences to mask a lack of understanding. It is important that your answers are in complete, readable sentences.

Item	Maximum score (%)
Organization, neatness and readability of informal notes	25%
Correctness and presentation of results (Including, where appropriate, tables, plots, error analysis)	35%

Depth and conciseness of answers to Discussion and Analysis questions	25%
Responses in complete sentences and paragraphs.	15%
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 submit assigned work on or before the scheduled due date or cannot take an exam on the scheduled date, the student **must** give notification to the instructor **no less than 24 hours before** the scheduled date and **no more than 48 hours after the** scheduled date.

A makeup lab is scheduled at the end of the lab (see Weekly Schedule).

Missed/Late Assignments

Missed/Late Assignments will be graded as zero.

Attendance

Attendance is required for every in-person lab session.

Course Accessibility

The University of Central Florida is committed to providing access and inclusion for all persons with disabilities. Students with disabilities who need access to course content due to course design limitations should contact the professor as soon as possible. Students should also connect with [Student Accessibility Services \(SAS\)](#) (Ferrell Commons 185, sas@ucf.edu, phone 407-823-2371). For students connected with SAS, a Course Accessibility Letter may be created and sent to professors, which informs faculty of potential course access and accommodations that might be necessary and reasonable. Determining reasonable access and accommodations requires consideration of the course design, course learning objectives and the individual academic and course barriers experienced by the student. Further conversation with SAS, faculty and the student may be warranted to ensure an accessible course experience.

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:

- a. 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 the 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 assignment, 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.

- b. Any student who knowingly helps another violate academic behavior standards is also in violation of the standards.
- c. 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 written 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.
- d. 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" designation 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.

Reporting an Incident or Issue

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

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 diversity and inclusion, Title IX, accessibility, or UCF's complaint processes contact:

- Title IX – OIE – [Office of Institutional Equity](#) & 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.

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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 related arrangements.

Campus Safety

At UCF 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 cell 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/faculty 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

Week	Topic
1	Introduction, Laser Safety, Lab #0
2	Lab #1: Light Sources and Radiometry
3	Lab #2: Reflection and Refraction
4	Lab #3: Prisms and Dispersion
5	Lab #4: Lens Shape, Power and Focal Length
6	Lab #5: Imaging with a Single Lens
7	Lab #6: Simple Camera, Pupil and Stop
8	Lab #7: Multiple Lenses
9	Lab #8: Chromatic Aberrations
10	Lab #9: Telescope Project (Week 1)
11	Lab #9: Telescope Project (Week 2)
12	Lab #10: Monochromatic Aberrations
13	Make-up, Gather add'l data for final report if needed (No class)
14	Draft final report (No class)

Week	Topic
15	Thanksgiving Holiday (No Class)
16	Final Report Due (No Class)