OSE 4830 - Imaging and Display

Section: 0001

Optics and Photonics

Course Information

Term: Spring 2026
Class Meeting Days: MW
Class Meeting Time: 06:00PM - 07:15PM
Class Meeting Location: CROL 0102
Modality: P
Credit Hours: 3.00

Instructor Information

Name: Dr. Maryam Mahmoodi
Title: Faculty Lecturer
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Course Description

OSE 4830 OPTIC 3(3,0)Imaging and Display: PR: EEL 3123C, and C (2.0 GPA) or higher in??OSE 3052. Mathematical and physical models of two- and threedimensional imaging systems including gazing, scanning, interferometric,

tomographic, and hyperspectral systems. Applications to remote sensing, biology, and medicine. Fall

Student Learning Outcomes

This course introduces the principles and technologies of optical imaging and display systems, organized around the fundamental properties of light that govern how images are formed, processed, and perceived. Students will study imaging as a complete system—from light sources and optical components to detectors, computation, and display—while exploring how spatial, spectral, temporal, coherence, phase, polarization, and power characteristics of light affect image quality and information content.

The course covers key imaging modalities, including wide-field imaging, confocal laser scanning microscopy, polarization-based imaging, optical coherence tomography (OCT), time-resolved imaging, and structured illumination microscopy. Core concepts from geometrical optics, wave optics, Fourier analysis, and photon statistics are introduced at an intuitive, application-oriented level. The second part of the course focuses on optical display technologies, emphasizing how light is generated, modulated, and perceived in modern display systems. The course emphasizes system-level thinking, physical intuition, and practical tradeoffs across a broad range of modern imaging and display technologies. Upon successful completion of this course, students will be able to:

- Understand optical imaging and display systems by identifying the roles of light sources, optical components, detectors, processing methods, and displays, and by explaining how key light properties influence system performance.
- Evaluate performance tradeoffs in imaging systems, including resolution, signal-to-noise ratio, exposure time, wavelength selection, and optical power constraints.
- Explain the principles of optical display technologies by describing how light is generated, modulated, and perceived in modern display systems.

Required Course Materials and Resources

Course notes available on Webcourses@UCF

Class Schedule

Course Schedule

Modules	Topic
0	Getting started: Syllabus Review & Course Expectations
1	Imaging as a System
2	Spatial Imaging & Resolution
3	Spatial Frequency & Image Processing
4	Wavelength & Spectral Imaging
5	Optical Power & Noise
6	Coherence & Interference Imaging
7	Phase & Wavefront Imaging
8	Temporal Imaging & Ranging
9	Polarization Imaging
10	Display Technologies I
11	Display Technologies II
12	Imaging Ethics and Emerging ideas

Policies for Course Grade

Course Activities

- Quizzes: Short in-class assessments to reinforce key concepts.
- Exercises: Practice problems and activities to build understanding and skills.
- Student Group Presentations: Team-based presentations on assigned projects.
- Exams: Mid-term and Final assessments.
- Extra Credit: Not offered.

Attendance

- Class attendance is required, and participation will be factored in the final grade.

Make-up Work Policy:

- Per university policy, you are allowed to submit make-up work (or an equivalent, alternate assignment) for authorized university-sponsored activities, religious observances, or legal obligations (such as jury duty). If this participation conflicts with your course assignments, I will offer a reasonable opportunity for you to complete missed assignments. The make-up assignment and grading scale will be equivalent to the missed assignment and its grading scale. Students are responsible for all material covered during missed sessions. In the case of an authorized university activity, it is your responsibility to show me a signed copy of the Program Verification Form for which you will be absent, prior to the class in which the absence occurs. In any of these cases, please contact me ahead of time to notify me of upcoming needs.

Course Assessment and Grading Procedure

Grading

Assessment	Percentage
Attendance & Participation	15%
Quizzes	10%
Exercises	10%
Presentations	15%
Midterm Exam	25%
Final Exam	25%
Total	100%

Grading Scale

Grading Scale

Letter Grade	Percentage
A	94-100%
A-	90-93%
B+	87-89%
B	84-86%
B-	80-83%
C+	77-79%

Letter Grade	Percentage
C	74-76%
C-	70-73%
D+	67-69%
D	64-66%
D-	61-63%
F	0-60%

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.

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;](mailto: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.

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.