



Course Syllabus

OSE 4830L Imaging and Display Laboratory

Instructor: Dr. Xiaoming Yu
Email: yux@creol.ucf.edu
Phone: 407-823-6872
Office: CREOL A337
TA: Boyang Zhou
zhouby0613@Knights.ucf.edu

Term: Fall 2021 Sect 1
Class Location: A210
Class Meeting Day: Wednesdays
Class Meeting Time: 8:30 AM - 1:20 AM
Office Hour: Open Door or
By Appointment

Website: Materials available on UCF Webcourses system

Course Catalog Description: The goal of this course is to provide the hands on experience on image acquisition, processing and analysis. The performance of various imaging, spectroscopic and display systems will be studied and simulated using Matlab image processing toolbox. This course complements the lecture course on Imaging and Display OSE4830.

Prerequisites: You must have completed or be co-registered in OSE4830 Imaging and Display lecture.

Course Overview:

The course consists of a sequence of interconnecting experiments for a variety of optical systems commonly used in optical design and devices. Students will become familiar with basic imaging processing functions in Matlab, and understand hardware-to-software data flow in benchtop optical experimentation. They will observe, record and analyze fundamental optical phenomena such as interference and diffraction and relate what they see in this lab with theories taught in the lecture class. They will practice technical writing in the form of lab reports.

Integrated Learning:

MATLAB is a critical computational tool for scientists and engineers. The O&P program has adopted teaching and using MATLAB throughout the curriculum. Students are expected to use their MATLAB proficiency to perform basic data analysis and fitting in one formal lab report.

Relationship of Course to ABET Criteria

Reference and Textbooks:

Lab Notes will be sufficient. They will be distributed a few days prior to the start of the corresponding Lab work. However, these books might be useful:

- J. W. Goodman, Introduction to Fourier Optics, 3rd Edition, Roberts & Co, 2004
- B. Saleh, Introduction to Subsurface Imaging, Cambridge University Press, 2011

Course Grading

Criteria	Grade Weighting
Attendance	40%
Lab reports (1-7)	60%
Total	100%

Final Exam Date: N/A

Make Up Policy: If an emergency arises and a student cannot participate in a lab on the scheduled date, the student **must** give notification to the instructor **no less than 24 hours before** the scheduled date or deadline.

Financial Aid and Attendance: As of Fall 2014, all faculty members are required to document students' academic activity at the beginning of each course. In order to document that you began this course, please complete the provided academic activity by the end of the first week of classes, or as soon as possible after adding the course, but no later than **August 27**. Failure to do so will result in a delay in the disbursement of your financial aid.

Grading Scale (%)	Rubric Description
A	Excellent, has a strong understanding of all concepts and is able to apply the concepts in all and novel situations. Has full mastery of the content of the course.
B	Good, has a strong understanding of most or all of the concepts and is able to apply them to stated and defined situations.
C	Satisfactory, has a basic understanding of the major concepts of the course and is able to apply to basic situations.
D	Below satisfactory, has a basic understanding of only the simple concepts and is able to apply to only a limited number of the most basic situations.
F	Demonstrates no understanding of the course content.

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 – NO EXCEPTIONS.

Homework Policy:

Each student must write a report for each lab and submit the report as a pdf file on the webcourses of this class by 11:59 pm by the due date (see the lab schedule at the end of this document for due dates). Late submissions will not be accepted. A team of students will do each experiment and the data can be shared among each team member. **Each student, however, must write his/her own report.**

Class Website:

Materials used for classes will be available on UCF Webcourses for download before each class.

Teaching vs. Learning:

Most people learn things for themselves, the lab is an excellent opportunity for experiential learning. You should come prepared with knowledge of the upcoming lab exercise described in the lab manual. Bring an inquisitive mind and a desire to gain understanding, rather than simply complete the lab as quickly as possible.

Professionalism and Ethics:

Per university policy and plain classroom etiquette, mobile phones, etc. must be silenced during all classroom lectures, unless you are specifically asked to make use of such devices for certain activities. Academic dishonesty in any form will not be tolerated! If you are uncertain as to what constitutes academic dishonesty, please consult The Golden Rule in the UCF Student Handbook (www.goldenrule.sdes.ucf.edu) for further details. As in all University courses, The Golden Rule Rules of Conduct will be applied. Violations of these rules will result in a record of the infraction being placed in your file and the student receiving a zero on the work in question AT A MINIMUM. At the instructor's discretion, you may also receive a failing grade for the course. Confirmation of such incidents can also result in expulsion from the University.

It is the nature of a laboratory course that you will be working in groups. Obviously, those of you who are lab partners will be using the same raw data. You are encouraged to discuss your observations and insights with your lab partners; however, each of you has to write your own ORIGINAL lab reports. Providing a fellow student with experimental data from an experiment in which he/she did not participate is a form of plagiarism and is forbidden. You are encouraged to use the internet as a resource for your final report; however, electronic copying and pasting of material directly into reports and papers without proper reference of the source is blatant plagiarism. **Always reference the sources of information.** If there is any question concerning acceptable practice in this laboratory course, don't hesitate to ask the instructor.

Students with Special Testing/Learning Needs:

Students with special needs and require special accommodations must be registered with UCF Student Disability Services prior to receiving those accommodations. Students must have documented disabilities requiring the special accommodations and must meet with the instructor to discuss the special needs as early as possible in the first week of classes. UCF Student Disability Services can be contacted at www.sds.sdes.ucf.edu or at (407)823-2371.

Schedule		
Week	Date	Lab Topic:
1	8/25	Introduction, Lab 0: Matlab Imaging Processing Toolbox
2	9/1	Report Due (graded, not counted in final grade)
3	9/8	Lab 1: Optical Image Resolution and Contrast
4	9/15	Report Due
5	9/22	Lab 2: Fourier Optics and the 4f System
6	9/29	Report Due
7	10/6	Lab 3: Fourier Transform and Diffraction Properties of Light
8	10/13	Report Due
9	10/20	Lab 4: Michelson Interferometer
10	10/27	Report Due
11	11/3	Lab 5: Speckle Interferometry
12	11/10	Report Due
13	11/17	Lab 6: Liquid-Crystal Display
14	11/24	Report Due (Thanksgiving)
15	12/1	Lab 7: Spectroscopy and Hyperspectral Imaging
16	12/8	Report Due (Final week)

Groups (6)

▼ Group 1

3 students



⋮ Brianna Chavira ⋮

⋮ Connor DiMatteo (He/Him/His) ⋮

⋮ Ethan Teodosio ⋮

▼ Group 2

3 students



⋮ Nicholas Schnauder ⋮

⋮ Christian Spurgeon ⋮

⋮ Joshua Walton ⋮

▼ Group 3

3 students



⋮ Matthew Boyles ⋮

⋮ Keana Paredes ⋮

⋮ Francisco Torres ⋮

▼ Group 4

3 students



⋮ Tyler Knight ⋮

⋮ Cristian Pearson ⋮

⋮ Hussein Shelleh ⋮

▼ Group 5

3 students



⋮ Collan Dimitri ⋮

⋮ Zia McDonold ⋮

⋮ Dylan Perkowski ⋮

▼ Group 6

3 students



⋮ Mateo Cuesta ⋮

⋮ Jessyka Jessurum ⋮

⋮ Trent Tanchin ⋮