



## SYLLABUS

OSE 4830L - Imaging and Display Laboratory  
CREOL, The College of Optics and Photonics  
University of Central Florida  
Fall 2020

Instructor:	Dr. Aravinda Kar	Term:	Fall 2020
Office:	CREOL Room 284	Class Location:	Room A210
Phone:	(407) 823-6921	Class Days and Hours:	Wednesdays 12:00 PM - 2:50 PM 3:00 PM – 5:50 PM 6:00 PM – 8:50 PM
E-Mail:	<a href="mailto:akar@creol.ucf.edu">akar@creol.ucf.edu</a>	Office Hours:	Wednesdays 10:00 AM – 11:00 AM
Website:	<a href="https://www.creol.ucf.edu/person/aravinda-kar/">https://www.creol.ucf.edu/person/aravinda-kar/</a>		
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### 1) Important Dates to Remember:

- **Academic Activity Confirmation: Monday, August 24, 2020 - Friday, August 28, 2020.**

**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 a student has begun the course, each student must complete an academic activity by the end of the first week of classes, or within the first week after adding the course. A student's failure to complete the academic activity will result in a delay in the disbursement of the student's financial aid.

- **Drop/Swap Deadline: Friday, August 28, 2020**

### 2) 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](http://www.sds.sdes.ucf.edu) or at (407) 823-2371.

### 3) University 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.

#### 4) Course Overview

The course consists of a sequence of interconnecting experiments for a variety of optical systems.

#### 5) Course Prerequisites

OSE4830 Imaging and Display. This lecture course will run in parallel with this lab course.

#### 6) Course Credit hour: 1

#### 7) Reference 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
- D. K. Yang and S. T. Wu, *Fundamentals of Liquid Crystal Devices*, 2nd Edition, Wiley, 2014

**8) Basis for Final Grade:** The final grade is based on a scale of 0 to 100 points for 6 experiments with corresponding 6 lab reports. The maximum point for each lab is listed in the lab schedule at the end of this document.

**Grading scale:** The letter grades are given at the end of the semester based on the scale in the following table.

Grading scale		
100 – 90 (A)	<90 – 86 (A-)	
<86 – 82 (B+)	<82 – 78 (B)	<78 – 74 (B-)
<74 – 70 (C+)	<70 – 66 (C)	<66 – 62 (C-)
<62 – 58 (D+)	<58 – 54 (D)	<54 – 50 (D-)
<50 (F)		

Note: The grading scale may be lowered only at the instructor's discretion depending on the degree of difficulty in the lab.

**9) Class Website and email:** Lab Notes will be available on UCF's Webcourses before each class. Use the emails (see the Table on Page 1) of the instructor and GTA for all correspondence.

## **10) Attendance, Make-up lab and Late Arrival:**

**10.1) Attendance** - Attendance is mandatory in all the lab classes. In case of absence in a lab for no emergency reason, zero credit will be given for that lab.

**10.2) Make-up lab due to emergency reason** - If an emergency arises and a student cannot attend a Lab on the scheduled date, the student **must** notify the instructor **no less than 24 hours before** the scheduled date and **no more than 48 hours after the** scheduled date. A make-up lab session will be arranged if official documents regarding the emergency are submitted to the instructor. The instructor will specify a new due date for submitting the report of the make-up lab. The late submission rule of section 11.3 will apply if the student fails to submit the report by the new due date. Any illness will be considered a medical emergency only if a doctor's letter, which confirms the illness, is submitted to the instructor as an official document within the time mentioned in this section. Zero credit will be given for the lab without official documents.

**10.3) Late Arrival** - Four points will be deducted from the scores received in a report for a student arriving late by 10 through 20 minutes. In case of arriving late to a lab by more than 20 minutes, zero credit will be given for that lab.

## **11) Lab Reports:**

**11.1) Report submission:** 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). 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.

**11.2) Late submission:** If the report is submitted late for no emergency reason, 3 points will be deducted per day for the first three days after the due date of the report. Zero credit will be given if the report is submitted more than three days after the due date. If the report is submitted N days late and the report receives a score of S points out of the total points assigned to the report, the final score for the report will be S-N. A fraction of a day will be counted as 1 day for determining N.

**11.3) Late submission under emergency:** If an emergency arises and a student cannot submit the report on or before the scheduled due date, the student must notify the instructor **no less than 24 hours before the scheduled date and no more than 48 hours after the scheduled date**. The instructor will specify a new due date for submitting the report after receiving official documents from the student. The late submission rule of section 11.2 will apply if the student fails to submit the report by the new due date. Any illness will be considered a medical emergency only if a doctor's letter, which confirms the illness, is submitted to the instructor as an official document within the time mentioned in this section. Zero credit will be given for the lab without official documents.

**12) Grade Dissemination:** The scores will be posted on UCF's Webcourses.

## **13) Score/Grade Objection:**

All objections to grades should be made in writing within one week after the report is graded on webcourses. Objections made after this period has elapsed will not be considered – NO EXCEPTIONS.

**14) Incomplete Grade:** The current university policy concerning incomplete grades will be followed in this course. Incomplete grades are given only in situations where unexpected emergencies prevent a student from completing the course and the remaining work can be completed in the next semester. The instructor is the final authority to decide whether you qualify for an incomplete grade. Incomplete work must be completed by the end of the subsequent semester when the lab class is offered, otherwise the “I” grade will automatically be recorded as an “F” on your transcript.

**15) Academic Integrity:**

- 15.1) A group of two or more students may work as a team to carry out the experiments, but each student has to turn in his/her own lab assignments and reports without copying from other students or sources. Experimental data can be shared among the members of the same team, but the rest of the report should be written individually.
- 15.2) UCF’s rule will apply in the case of any breach in the academic integrity.

**16) Lab Etiquette:**

- 16.1) A group of two or more students may work as a team to carry out the experiments. Each student is required to fully participate in the experiments and cooperate with other team members.
- 16.2) Foods and drinks are not allowed in the lab.
- 16.3) Use of cellphones, headphones, writing homeworks or any activities unrelated to the lab are not allowed.
- 16.4) Students should not disturb or interfere with neighboring groups.
- 16.5) Keep your optical table area neat and free of any unnecessary tools and equipment. Your book bag and other personal belongings should be kept in a designated area away from the optical table.
- 16.6) After completing your experiment, turn off all equipment, disassemble the experimental setup and separate the circuit elements in groups of similar apparatus, e.g., all resistors and electrical connectros should be separated as two groups of apparatus.
- 16.7) Contact your TA to return all the components that you took at the beginning of the lab.
- 16.8) Clean your optical table before you leave the lab.

**17) Lab safety:**

- 17.1) Do not look at any laser beam or even the LED light directly.
- 17.2) Do not be in the path of any laser beam or even the LED light.
- 17.3) Wear safety goggles. The goggles should be suitable for the power and wavelength of the light that you will use in your experiment.

**18) 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](http://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. You may also receive a failing grade for the course. Confirmation of such incidents can also result in expulsion from the University.

**19) Lab schedule:**

Date	Lab number	Topic	Point
8/26	0	Introduction and course logistics. Getting acquainted with MatLab Image Processing tools.	
9/2	1	Optical Image Resolution and Contrast	16
9/9		Write and submit report for Lab 1	
9/16	2	Fourier Optics and the 4f System	16
9/23		Write and submit report for Lab 2	
9/30	3,4	Fourier Transform and Diffraction Properties of Light Teams 1-3 will do Lab 3 Teams 4-6 will do Lab 4	17
10/7		Teams 1-3: write and submit report for Lab 3 Teams 4-6: write and submit report for Lab 4	
10/14	4,3	Michelson Interferometer Teams 1-3 will do Lab 4 Teams 4-6 will do Lab 3	17
10/21		Teams 1-3: write and submit report for Lab 4 Teams 4-6: write and submit report for Lab 3	
10/28	5,6	Speckle Interferometry Teams 1-3 will do Lab 5 Teams 4-6 will do Lab 6	17
11/4		Teams 1-3: write and submit report for Lab 5 Teams 4-6: write and submit report for Lab 6	
11/11		Holiday: Veteran's day	
11/18	6,5	Spectroscopy and hyperspectral imaging Teams 1-3 will do Lab 6 Teams 4-6 will do Lab 5	17
11/25		Thanksgiving holiday	
12/2		Teams 1-3: write and submit report for Lab 6 Teams 4-6: write and submit report for Lab 5	
12/4 (Friday)	Last day of UCF classes		
12/7-12/12	UCF's final examination period		