



CREOL OSE 4830L: Imaging & Display Laboratory
College of Optics and Photonics, Fall 2016
University of Central Florida

COURSE SYLLABUS

Instructor:	Dr. Konstantin Vodopyanov	Term:	Fall 2016
Office:	CREOL Room A113	Class Days:	Mondays
Phone:	407 823 6818	Class Hours:	12 - 3 pm
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Office Hours:	Fridays 4-6 pm	TA:	Evan Hale

I. Welcome!

Welcome to CREOL OSE4830L course - Imaging and Display Laboratory

II. 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 and display systems will be studied and simulated using MatLab image processing toolbox. This course will complement the theory course on Imaging and Display OSE4830.

III. Course Overview:

The course consists of a sequence of seven interconnecting experiments (preceded by an introductory class on how to use MatLab tools) with a variety of imaging systems. In laboratory sessions, students will learn the practical aspects of optics experiment and get acquainted with imaging systems. The topics include: Simulation of imaging formation and processing using MatLab image processing toolbox; Measurement of the optical transfer function of an imaging system; Design and testing of a Michelson interferometer for surface profiling; Use of a microscope for analyzing pixel arrays; Use of a spectrophotometer for multispectral imaging and material identification; Measurement of the basic characteristics of a liquid-crystal display.

Participation is capped at 12 students, because of equipment and space limitations. After the first class, (22-Aug) experimental sessions will be held once every two weeks (starting 29-Aug) in 3-hour sessions. The second week for each Lab will be dedicated to report writing. Total there will be 7 experiments.

IV. Course Prerequisites:

OSE4830 Imaging and Display; this lecture course will run in parallel with our course.

V. Course Credits:

1

VI. Reference Textbooks:

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

- 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
- J. W. Goodman, *Introduction to Fourier Optics*, 3rd Edition, Roberts & Co, 2004

VII. Basis for Final Grade:

Assessment	Percent of Final Grade
Lab Reports	100%
	100%

Grading scale:

Grading Scale (%)	
90-100	A
80 - 89	B
70 - 79	C
60 - 69	D
0 - 59	F

VIII. Lab Reports

Lab reports should be submitted as *pdf* files no later than 11:59 pm on Sunday of the 2-nd week for each experiment (that is the day preceding the next Lab work). There will be a reduction in the grade of 10% per day for late submissions. A team of two students does each experiment, however each student writes his/her own report (data may be shared).

IX. Grade Dissemination

You can access your scores using UCF *Webcourse*.

X. Course Policies: Grades

Late Work Policy: As a rule, there are no make-ups for the laboratory work. The lab work needs to be done only during allocated hours.

Grades of "Incomplete":

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 the next semester*. Instructor is the final authority

on whether you qualify for an incomplete. Incomplete work must be finished by the end of the subsequent semester or the “I” will automatically be recorded as an “F” on your transcript.

XI. Course Policies: Technology and Media

Email: Please use email *vodopyanov@creol.ucf.edu* for all correspondence.

Website: All information concerning the course will be posted at *Webcourse*. This site will reflect latest changes and contain assignments for the coming lab work

XII. Course Policies: Student Expectations

Disability Access: The University of Central Florida is committed to providing reasonable accommodations for all persons with disabilities. Students with disabilities who need accommodations in this course must contact the professor at the beginning of the semester to discuss needed accommodations. No accommodations will be provided until the student has met with the professor to request accommodations. Students who need accommodations must be registered with Student Disability Services, Student Resource Center Room 132, phone (407) 823-2371, TTY/TDD only phone (407) 823-2116, before requesting accommodations from the professor.

Attendance Policy:

- Students must be on time to class.
- If missed a class (for a good cause), it is the responsibility of the student to arrange with a TA an extra time for doing experiment. One extra week (at the end of semester) will be allocated in case students want to redo any experiment if they want to get a better grade.

Professionalism Policy:

Per university policy and classroom etiquette: mobile phones etc. **must be silenced** during all classroom lectures. Those not heeding this rule will be asked to leave the classroom immediately so as to not disrupt the learning environment. Students who habitually disturb the class by talking, arriving late, *etc.*, and have been warned may suffer a reduction in their final class grade.

Academic Conduct Policy:

Academic dishonesty in any form will not be tolerated. As in all University courses, The Golden Rule of Conduct will be applied. Violations of these rules will result in a record of the infraction being placed in your file and 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.

XIII. Important Dates to Remember

Drop/Swap Deadline: Aug 25, 2016

XIV. Schedule

1	22-Aug	Course logistics. Good practices of optics experiment. Lab. Work 1: Getting acquainted with MatLab Image Processing tools.
2	29-Aug	Lab. Work 2: Optical Image Resolution and Contrast
3	5-Sept	Holiday. Labor Day. <i>Writing report for Lab 2</i>

4	12-Sept	Lab. Work 3: Spatial Filtering and Optical Image Processing
5	19-Sept	<i>Writing report for Lab 3</i>
5	26-Sept	Lab. Work 4: Fourier Transform and Diffraction Properties
6	3-Oct	<i>Writing report for Lab 4</i>
8	10-Oct	Lab. Work 5: Michelson Interferometer I
9	17-Oct	<i>Writing report for Lab 5</i>
10	24-Oct	Lab. Work 6: Michelson Interferometer II. Speckle Interferometry
11	31-Oct	<i>Writing report for Lab 6</i>
12	7-Nov	Lab. Work 7: Spectroscopy and hyperspectral imaging
13	14-Nov	<i>Writing report for Lab 7</i>
14	21-Nov	Lab. Work 8: Liquid crystal display
15	28-Nov	<i>Writing report for Lab 7</i>
16	4-Dec	Final Report deadline