



CREOL OSE4830L course - Imaging and Display Laboratory
College of Optics and Photonics, Fall 2022
University of Central Florida

COURSE SYLLABUS

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|---------------|---|-----------------------|-------------------------------------|
| Instructor: | Dr. Konstantin Vodopyanov | Term: | Fall 2022 |
| Office: | CREOL Room A113 | Class Days: | Thursdays |
| Phone: | 407 823 6818 | Class Hours: | 8:30 - 11:20 pm 12:00 - 14:50 pm |
| E-Mail: | vodopyanov@creol.ucf.edu | Class Location: | Room A210 |
| Website: | https://www.creol.ucf.edu/mir/ | | |
| Office Hours: | Arrange by email | TA: Dmitrii Konnov | |

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, spectroscopic 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 interconnecting experiments (preceded by an introductory class on MatLab) with a variety of optical systems. In laboratory sessions, students will learn practical aspects of optics experiment. Participation is capped at 12 students, because of equipment and space limitations. After the first class, (25-Aug) experimental sessions will be held once every two weeks (starting 1-Sep) in 2 hour and 50 minutes sessions. The second week after each Lab session will be dedicated to data processing report writing. Total there will be 7 experiments.

IV. Course Prerequisites:

OSE4830 Imaging and Display.

V. Course Credits:

1

VI. Reference Textbooks:

- 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

However, Lab. Notes will be sufficient. They will be distributed prior to the start of the corresponding Lab work.

VII. Basis for the Final Grade:

| Assessment | Percent of Final Grade |
|--------------------|------------------------|
| Lab Reports | 78% |
| Pre-Lab Interviews | 22% |
| | 100% |

Grading scale:

| Grading Scale (%) | |
|-------------------|----|
| 94-100 | A |
| 90-93 | A- |
| 87-89 | B+ |
| 84-86 | B |
| 80-83 | B- |
| 77-79 | C+ |
| 74-76 | C |
| 70-73 | C- |
| 67-69 | D+ |
| 64-66 | D |
| 60-63 | D- |
| 0 - 59 | F |

VIII. Lab Reports

Lab reports should be submitted as *pdf* files no later than 11:59 pm on Wednesday of the 2-nd week for each experiment (that is the day preceding the next Lab work; for example, it will be Wednesday evening, Sept. 14, for the Lab 2 report). Late submission will result in a 10% deduction per day. A team of two students will be assigned for 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 (TA does not have extra time to stay in the lab for extra 3 hours). 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 the email: vodopyanov@creol.ucf.edu for all correspondence.

Website: All course information will be posted on *Webcourses*. 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 session at the end of the semester (8-Dec) will be allocated in case students want to redo a certain experiment to get a better grade.

Professionalism Policy:

Per university policy and classroom etiquette: mobile phones etc. **must be silenced** during all classroom lectures. 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: Friday, Aug 26, 2022

XIV. Schedule

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|----|---------|---|
| 1 | 25-Aug | Lab. Work 1: Introduction and course logistics. Good practices of optics experiment. Getting acquainted with MatLab Image Processing tools. |
| 2 | 1-Sept | Lab. Work 2: Optical Image Resolution and Contrast |
| 3 | 8-Sept | <i>Writing report for Lab 2</i> |
| 4 | 15-Sept | Lab. Work 3: Fourier Optics and the $4f$ System |
| 5 | 22-Sept | <i>Writing report for Lab 3</i> |
| 6 | 29-Sep | Lab. Work 4: Fourier Transform and Diffraction Properties of Light |
| 7 | 6-Oct | <i>Writing report for Lab 4</i> |
| 8 | 13-Oct | Lab. Work 5: Michelson Interferometer |
| 9 | 20-Oct | <i>Writing report for Lab 5</i> |
| 10 | 27-Oct | Lab. Work 6: Speckle Interferometry |
| 11 | 3-Nov | <i>Writing report for Lab 6</i> |
| 12 | 10-Nov | Lab. Work 7: Spectroscopy and hyperspectral imaging |
| 13 | 17-Dec | <i>Writing report for Lab 7</i> |
| | 24-Nov | Thanksgiving, no class |
| 14 | 1-Dec | Lab. Work 8: Liquid crystal display |
| 15 | 8-Dec | <i>Writing report for Lab 8</i> |
| | 10-Dec | Final Grades |