

Course Syllabus

OSE 4952 Senior Design 2

Fall 2017

Friday 9:00 AM -11:50 AM HEC 119

(Second section, 12:00 PM- 2:50 PM – attend with your group!)

Instructor: Dr. David Hagan

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Office CREOL 209

407-823-6817

Office Hours: By appointment, or stop by.

Catalog description: Development of the technical, communication, and team skills for successful design of optical and photonic systems. Preparation of project proposals for Senior Design II.

Prerequisites OSE 4951 and OSE 4520; CR: OSE 4410 and OSE 4470 and C.I

Co-teaching with EEL 4915L Senior Design 2:

Photonic Science and Engineering students are expected to engage in interdisciplinary projects with electrical and computer engineering students. For this reason, students will attend all classes with the electrical and computer engineering students enrolled in EEL 4914L Senior Design 2. Most assignments will be common to both courses, however, Dr. Hagan will be responsible for assessment and grading of students enrolled in OSE 4952. The grading standards will be common to both courses.

In addition to attending all EEL 4915L classes, students must meet regularly with Dr. Hagan. The schedule for these meetings will be set up in the first week of the semester.

The instructor for EEL 4914C is:

Dr. Lei Wei, HEC---418

Texts:

1. DESIGN FOR ELECTRICAL AND COMPUTER ENGINEERS, McGraw---Hill (chapter 3)
2. SENIOR DESIGN FOR ELECTRICAL AND COMPUTER ENGINEERINGS STUDENTS, Pearson Custom Publishing (**3 chapters**)

Software: Varies by Project, Circuit Simulation Software, Schematic Capture Software, PCB Software, Matlab, Zeemax, Light Tools, etc.

Attendance in class is required. Assignments are due when collected by the instructor. All or only a part of the collected homework may be graded. All exams are mandatory. The final grade will be based on your performance on attendance, exam performance, presentation performance, and final project documentation, as described later. In addition, failure to comply with course requirements or expectations may result in a lower grade as determined

to be appropriate by the instructor.

Any act of academic dishonesty or unprofessional behavior will result in a failing grade on an exam or in the course.

Preliminary Course Information

The OSE 4951 and OSE 4952 Senior Design courses are intended to serve as capstone courses for the Photonic Science and Engineering Bachelor of Science Degree. **These courses subject the students to an environment unlike the majority of their previous curriculum.** Students will encounter aspects of engineering design not found in prior coursework. Students will be responsible for their own learning as a team. In other classes, students are given homework, quizzes, labs and tests in a structured and scheduled manner, but in Senior Design it is the team’s responsibility to schedule their project, assign responsibilities, build the functioning device or system that meets specifications, document the results of the team’s efforts in written reports.

Summary of primary activities in the semester:

Week (Approximate)	Topic
1	Introduction to semester activities.
2	Lecture on preparation of critical design review
3,4,5	Critical design review presentations: Groups in turn present a review of their project status. All students must attend and will grade these presentations. At this point, all details of design, specifications and constraints should be final.
6,7	No class – work on projects. Design Testing continues. Weekly design meetings, collecting data, recording in journal.
8,9	Mid-term demonstrations. – By now projects should be largely functional
8	End of semester (EOS) preparation lecture.
9	Final class
10	8-page conference paper due.
11	Final presentations
12	Final exam week. Final report due (120 pages)

Course goals: To provide students a complete design experience, including the necessity to set design goals and objectives, integrate knowledge, exercise engineering judgement, plan to meet a budget and a schedule, to work as a team member, and to communicate in writing.

Specific Course objectives:

This class is a required course for Photonic Science and Engineering students and serves as the first part of the capstone design course sequence. The course objectives are to enable students to:

- Learn standards based design practices
- Incorporate appropriate human factors into designs
- Develop knowledge of Engineering Economics
- Recognize and address ethical issues related to design and engineering
- Develop an understanding of the Engineering Design Process, Engineering Teamwork and Project Documentation

Learning Outcomes

Upon completing this course, the students will be able to:

- Identify specific goals of the designed system, including specifications and realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability constraints.
- Collect information on available components and standards related to design needs,
- Develop appropriate models and using computer tools for system analysis,
- Perform testing and failure analysis
- Prepare written proposals and delivering technical information through oral presentations, reports and logbooks
- Work in a team environment
- Recognize and address ethical issues related to design and engineering
- Develop a customer relationship and mentality

Assessment:

The final grade will be primarily based on the final project documentation and presentation. A rubric for how the final document is graded is provide on webcourses. The faculty committee grading of the presentation will be the primary factor in determining the group grade. However, overall course grade for an individual may be modified by timeliness of submission of assignments, attendance and by the individual's performance as part of the team. No grades are assigned, **on other elements, such as critical design review report, etc.** only indications of completion are recorded. If a student fails to demonstrate competency on an assignment, the assignment must be repeating until mastered. In cases where group members do not adequately contribute to the project, members may be dropped from the group and those students will receive a grade of F for the course.

To complete the course with a passing grade, the device or system must work, meeting most specifications, at the demonstration which follows the final presentation. The final device or system must be a well-engineered system that is robust and tolerant to the environment. Optical components mounted on a breadboard are not acceptable. The machine shop course that students must take will help them learn how to make a robust mechanical system to house optical components, etc. Failure to meet this requirement will result in a grade of F or I depending upon the circumstances as dictated by the course instructor.

Final reports for photonics projects MUST contain a section at the end which contains results of testing of the final device or system. Where appropriate, this section should describe any explanation of why specifications or constraints were not met.

Textbook	1. DESIGN FOR ELECTRICAL AND COMPUTER ENGINEERS, McGraw-Hill 2. SENIOR DESIGN FOR ELECTRICAL AND COMPUTER ENGINEERING STUDENTS, Pearson Custom Publishing
References	Depends upon the group's project. Consultation with appropriate faculty and professionals is encouraged. Consider all your sources for information.
Computer Usage	There will be no specific computer assignments. However, word processing is required for all documentation. Most projects will utilize computer simulation during the design, while other projects may be based on embedded control, the use of a personal computer, or single board computer applications where software and/or hardware development will be required.
Machine shop course	Photonics senior design students must complete a short machine shop course offered by the college of Optics and Photonics before the end of senior design 1 semester.
Safety	University policy requires that for safety reasons, at least two people must be present in the laboratory premises at any time. Violators will be asked to leave the laboratory premises. Since it is not possible to police this policy at all times, violators will be working entirely at their own risk.
Exams	There will be no exams.
Expenses	Neither the College of Optics and Photonics, nor the Department of Electrical Engineering and Computer Science will not provide project parts beyond what is available in school laboratories. The cost of the project may be exclusively yours, exclusively your sponsor's, or may be shared. The most common case is that the project is funded by the student group or by a sponsoring group, agency, or corporation. NOTE: If project expenses are paid in part or in whole by the college or department then the project becomes the property of the school and it must remain at UCF.
Final Documentation	The required final documentation consists of a formal technical document consisting of research, design, theory of operation, construction and testing.
Laboratory	No formal laboratory work is required. However, virtually all projects require hardware prototyping which will include construction and testing. Laboratory space and facilities will be available for this purpose. In order to protect project installations, only students that are registered in the class will be allowed in the lab. You can work in the laboratory during non-business hours and on weekends by using your college keycards, and if needed requesting entry to the engineering building from the UCF Police Department. Identification will be required. Due to the policy stated below, the police will not provide entry to a single student. A minimum of two students are required when working in the laboratory.

WARNING

University policy requires that for safety reasons, at least **two people must be present in the laboratory premises** at any time. Violators will be asked to leave the laboratory premises. Since it is not possible to police this policy at all times, violators will be working entirely at their own risk.

In-Class Presentations

During the course of the two semesters, each group will make at least two presentations to the rest of the class during normal lecture or laboratory hours. This will serve as a critical design review for your project. The schedule for these presentations will be set just prior to this time.

Consultations

Consulting on each project will be available either from the course instructor or from any other Optics or ECE Department faculty member who has expertise on the subject of your project. Each team is encouraged to find a faculty member who will act as a technical advisor for the project. Appointments should be made for consultation times.

Grading will be based on:

- Critical Design Review
- Final Project Presentation
- Group Peer Evaluation
- Final Documentation
- Attendance

Important Warning The grading in the OSE 4951 course requires that **your prototype work as specified**. Failure to meet this requirement will result in a grade of F or I depending upon the circumstances as dictated by the course instructor.

Academic activity:

Students' academic activity is required by UCF to be recorded at the beginning of each course. Failure to do so may result in a delay in the disbursement of your financial aid. **The assignment to satisfy this requirement is for all students to submit their group number on or before 12:00 PM (noon) on August 25, 2017.**