

ELEC 4309 Senior Design I

College of Engineering and Applied Science
University of Colorado Denver

Term: Fall 2017
Course time: TuTh 6:30-7:45
Course location: North Classroom 2408
Office Hours: TuTh 5:30 – 6:30

Instructor: Wendell Chun
Office location: North Classroom 2620
Email: wendell.chun@ucdenver.edu

Course Design

Catalog Description:

Design methodology and tools, project planning and team building, ethics in engineering and research, career planning and portfolio building. Project designs are completed and presented to the class. Prereq: Students must complete their Senior/30 hour check prior to enrollment. ELEC 4309 and ELEC 4319 must be completed in subsequent academic semesters.

Instructor Description:

Completing a senior design project is the culminating experience for undergraduates in the Engineering curriculum. In the Senior Design Project course, students apply the knowledge they have gained during their time as an undergraduate to a group project; the group works together to design and create a solution to an engineering problem in the real world. This is Part I of a two-part class. Each student must complete a team-driven capstone project in which they design and prototype a product, electronic device, or software system. A major focus of this class will be on the engineering design process, including defining the problem, identifying criteria for success, discussing potential ethical issues, brainstorming conceptual designs, and formulating the detailed (final) design. Students will work in teams on a design problem, and in the process will experience the engineering design approach, as well as learn the importance of managing the design process and communicating design outcomes.

Prerequisites: All required ELEC 3000-level classes and labs.

Course Objectives:

Students will understand one of the fundamental skills in engineering, solving problems and engineering design. Design is a process and require engineers to work in teams. There are a number of various design approaches and architectures from waterfall to “Vee” to spiral models. The process starts with a problem, followed by requirements and constraints. The teams employ brainstorming and other innovative techniques to develop viable concepts. The teams move from initial concepts to final detail design with appropriate analysis and incremental design. This starts with an architecture that bridges requirements to the design. A risk analysis of the design is conducted, and leading risks are mitigated with early hardware/software demonstrations as proof of principles. Everything is documented in the final design book.

Requirements

Recommended Texts: None.

Additional, Materials, Equipment:

Weekly lectures available off of class website on Canvas.

Assignments and Examinations:

There is a mid-term presentation, monthly team status reports, an ethics homework, a final design presentation, and a comprehensive design data book.

Assessment Design

Grading:

Mid-term Presentation: 20%
Ethics Homework: 5%
Marketing Brochure: 5%
Monthly Status Memo: 10%
Final Presentation: 20%
Final Data Design Databook: 40%

Final Grade:

A: 100-90
B: 89-80
C: 79-70
D: 60-60
F: 50-0

Course Policies:

- Homework will follow the guideline sheet handout. Copied material will not be accepted and a zero grade entered.
- Final Project can be individual or a small team effort. Late work will not be accepted. \
- Final projects are constrained by material costs.
- Course syllabus is subject to change, but students will be informed for open discussion prior to any changes.

Course Schedule

Proposed Schedule

Week	Date	Lecture Topic
1	Aug 23	Introduction
2	Aug 30	Design Process
3	Sept 6	Problems and Requirements
4	Sept 13	Brainstorming Techniques
5	Sept 20	Conceptual Design
6	Sept 27	Decision-Making
7	Oct 4	Mid-term Presentations
8	Oct 11	Intellectual Property and Patents
9	Oct 18	Risk Analysis
10	Oct 25	Architectures
11	Nov 1	DeMarco Model
12	Nov 8	Hatley-Pirbhai Model
13	Nov 15	Data Flow Diagrams
14	Nov 22	Fall Break
15	Nov 29	Detail Design
16	-	Standards & Ethics
17	Dec 6-8	Final Design Presentations

Course Communication

The instructor can be reached during regular office hours. Email is another good way to reach the instructor and will typically be replied within 48 hours.

Students called for military duty

- If you are a student in the military with the potential of being called to military service and /or training during the course of the semester, you are encouraged to contact Paul Rakowski.