ELEE 4920 and CSEE 4911: Capstone Engineering Design Project II

College of Engineering
Spring Semester, 2018

Description: Engineering design project experience under the supervision of a project mentor.

Course Prerequisite: ELEE 4910 or CSEE 4910 and permission of department.

Instructors:
Dr. Peter Kner
501 Driftmier Engineering Center
706-542-8966
kner@engr.uga.edu
Office Hours: By appointment or whenever I'm in my office.

Dr. Fred Beyette
615 Driftmier Engineering Center
706-542-8698
Fred.Beyette@uga.edu
Office Hours: By appointment.

Teaching Assistant: None.

Schedule:
You must keep the time Wednesdays 4:40 – 6:35 pm available. The room will be announced. For meetings on 1/10, 1/24, and 3/7, the room will be Miller Plant Sciences 1501.

Books: None

Course Learning Objectives:
1. Develop critical thinking skills.
2. Follow the design process.
3. Use project management tools.
4. Synthesize and apply engineering and scientific knowledge.
5. Communicate effectively.
6. Work in teams effectively.

Attendance:
Attendance is **mandatory** for all class meetings, group assessment meetings, mid- term and final presentations. Consequences for absences can include:

1) Receiving a grade of zero on the work associated with the absence. For example, absence during a mid-term presentation will result in a zero on that assignment.
2) Being "fired" from your group. That is, you are removed from the group to which you initially were assigned.
3) Being dropped from the course.

Team Management: The faculty mentor provides guidance to the design team but does not participate as a design team member. Each team is to have a team manager who is a member of the team and is elected by the team. Meetings with the faculty mentor will be scheduled on a regular basis. Regularly scheduled meetings with the faculty mentor is mandatory. All team members are expected to attend each regularly scheduled meeting with the mentor. Materials presented or distributed will not be repeated or redistributed for the benefit of absentees. Students are expected to arrive on time.

Design Notebooks: Each student must maintain a design notebook which records all activities completed related to your individual contribution to the design. "Activities" include notes from all meetings, notes regarding communications with stakeholders and vendors, mathematical analysis and calculations, simulation, algorithms, sketches, output from spreadsheets, flow charts, computer code, relevant/condensed output from computer simulations, circuit design, circuit analysis. Your design notebook is the documentation for all that you individually have contributed to the design. You may keep your design notebook on paper or on the computer. Microsoft OneNote, wikis, blogs are all good choices.

Progress Reports: Progress reports must be submitted via ELC, delivered to your mentor, and kept in your design notebook. Reports will consist of a one or two paragraph summary of progress since the last report and all additions/changes to your design notebook. This should be uploaded to ELC as a PDF file. At a minimum, progress reports are due every two weeks.

There will be 5 progress reports due over the semester: Jan. 26, Feb. 9, Feb. 23, March 30, April 13.

Midterm Project Presentation: March 7.

Senior Design Showcase: The semester will culminate in a showcase for all senior design projects. Each team will prepare a poster explaining their senior design project and will demo their project at the showcase. This is mandatory for all students.

Abstracts: April 16 at 12pm. Submit via email to Michael Wooten at mwooten@uga.edu with subject line "Senior Design Abstract" + project title. lauren.anglin@uga.edu must be copied on this submission. Abstract should be 1 paragraph. 1 image can also be submitted to be included in the project booklet. Abstract must also be uploaded to ELC.

Poster: April 23 at 12pm. Upload to ELC and submit via email to lauren@anglin@uga.edu. Slides must be formatted with the approved template. The approved template can be found at http://www.engineering.uga.edu/current/undergraduate/capstone/student/poster

Final Report: April 26. Upload to ELC.

Showcase: April 30. 12 – 6pm. Setup project in the Tate Grand Hall.

Grading:
Design Notebook and progress reports (individual grade) 20%
Midterm presentation (team grade) 20%
Final Design Report (team grade) 30%
Showcase (team grade) 30%

The overall performance of the student will be determined by assessing the student's ability to apply

- the principles of design
- scientific and engineering principles in the development of a solution

- engineering knowledge to analyze, solve and predict performance of a solution
- engineering knowledge to produce the required documents to fabricate a product/system to solve the problem
- critical thinking skills and knowledge developed throughout the engineering curricula
- self-learning skills and gain knowledge, not found in the curriculum, but needed to solve the problem
- financial and other economic analysis to determine the cost of the developed solution, and
- interpret the impact of the solution on the environment and the welfare of society as a whole.
- Presentation Skills

The final class grades will be based approximately on the following scale:

90-100	A
87-89	A-
84-86	B+
80-83	B
77-79	B-
74-76	C+
70-73	C
67-69	C-
60-66	D
<60	F

The letter grade cutoffs may shift slightly, but the rank ordering of grades will match the rank ordering of student performance.

Academic Honesty: The short version
Working with others on homework and labs is allowed, but make sure that you understand the material yourself and write the assignments in your own words. **Directly copying the work of someone else is not allowed.**

College Grading Policy Regarding Communication Skills
Up to 30% of the grade on all written assignments (lab reports and papers) and oral presentations will be based on quality of communication. Spelling, grammar, punctuation, and clarity of writing are evidence of written communication quality. Enunciation, voice projection, clarity and logical order of the presentation and effective use of visual aids are evidence of oral communication quality.

Engineering Professionalism Policy & Academic Honesty
Engineers make great contributions to society. Engineering is a very satisfying profession that provides many rewards but is demanding and requires hard work. The engineering profession is governed by a code of ethics. Engineering faculty at UGA expect students to act in a professional manner at all times and develop the work ethics required for a successful engineering career. Engineering students at UGA are responsible for maintaining the highest standards of professionalism and professional practice. All students are responsible for maintaining the highest standards of honesty and integrity in every phase of their academic careers. The penalties for academic dishonesty are severe and ignorance is not an acceptable defense. All academic work must meet the standards contained in the document "A Culture of Honesty." Students are responsible for informing themselves about those standards before performing any academic work. The link to more detailed information about academic honesty can be found at http://www.uga.edu/honesty/ahpd/culture_honesty.htm.

ABET EC-2000 Criterion 3 Program Outcomes

a) an ability to apply knowledge of mathematics, science, and engineering
b) an ability to design and conduct experiments, as well as to analyze and interpret data
c) an ability to design a system, component, or process to meet desired needs
d) an ability to function on multi-disciplinary teams
e) an ability to identify, formulate, and solve engineering problems
f) an understanding of professional and ethical responsibility
g) an ability to communicate effectively
h) the broad education necessary to understand the impact of engineering solutions in a global and societal context
i) a recognition of the need for, and an ability to engage in life-long learning
j) a knowledge of contemporary issues
k) an ability to use techniques, skills, and modern engineering tools necessary for engineering practice

Course Learning Objectives Upon successful completion of this course, the student will be able to:	**Coverage of Program Outcomes***	**Assessment Method**
1. Develop critical thinking skills.	**a,e,k**	**Interaction with mentor, Design Notebooks**
2. Follow the design process	**a,b,c,e**	**Design Notebooks, Progress Reports**
3. Use project management tools.	**a,b,c,e,k**	**Progress Reports**
4. Synthesize and apply engineering and scientific knowledge.	**a,b,c,e,f,k**	**Interaction with mentor, Design Notebooks, Midterm and Final Report**
5. Communicate effectively.	**g**	**Midterm and Final Presentations**
6. Work in teams effectively.	**d**	**Interaction with mentor**

Overall Course Contribution to Program Outcomes		
a- extensive	e- extensive	i- moderate
b- extensive	f- some	j- moderate
c- extensive	g- extensive	k- extensive
d- extensive	h- some	