CSEE/ELEE: Capstone Engineering Design Project I

Fall 2017

The course syllabus is a general plan for the course; deviations announced to the class by the instructor(s) may be necessary and will be reflected in this document at that time.

Description

Engineering design project experience under the supervision of a project director.

Instructors

Dr. Kyle Johnsen
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Teaching Assistant

None

Schedule

Tuesdays 5:00pm – 7:45pm
Forestry Resources Building 4. Rpp, 517 (CSEE, Johnsen's projects)
Life Sciences Building Room C120 (ELEE, Kner's projects)
TBD for Fanning Institute Modules.

Note, the above is generally considered your time to meet with your group, or to attend lectures and presentations. Separately scheduled meetings between your group and project mentor will be scheduled as well.

Required Course Materials

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.

Requirements and Assessments

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.

You may be assigned to a project governed by a different capstone course (e.g. not CSEE/ELEE). In this case, you must adhere to the requirements of that course **in addition to** attending the CSEE/ELEE lectures. **Your grade will be provided by the instructor for the course the project is assigned to according to their policy (read their syllabus).**

(All CSEE/ELEE Students) Fanning Institute Module Participation: Regularly scheduled modules will be scheduled to work on various professional skills. You must attend and participate in these modules. Failure to do so will result in immediate removal from the course.

8/22 – Creating my leadership vision
9/5 – Exploring Leadership Styles
9/12 – Making group decisions
9/19 – Managing Conflict
10/3 – Developing Personal Accountability
10/17 – Risk and Accountability

These will be at regular class time, but will likely be in an auditorium alongside ELEE students.

(Individual CSEE/ELEE Project Students) 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. 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. You must be prepared to show your design notebooks to your faculty mentor at any time.

(Individual CSEE/ELEE Project Students) 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. This should be uploaded to ELC as a PDF file. Progress report due dates will be posted, and will be required, on average, every two weeks. You are expected to work, at a minimum, 6 hours each week on your project. Progress reports must explain how you used these 6 hours (or more).

(CSEE/ELEE Project Groups) Problem Statement: Due 9/5. A brief statement of the problem you are trying to solve. Why is there a need? You are expected to have had a meeting with your mentor and client at this point, presenting them your view of the project, and receiving feedback. This is a resolution of the project description and the constraints/requirements of the course. This statement, if accepted by your project mentor and your client, will override the problem statement provided initially.

(CSEE/ELEE Project Groups) Midterm Project Report: Due 10/3. Your report must include the following sections:

- Team management and structure (leadership and roles, project management tools)
- Problem statement (including any revisions).
- Background research on the problem and domain
- Problem Analysis (Breakdown into subproblems of various complexity, technical requirements)
- Preliminary design proposal(s)

This must be delivered **to your client** and **faculty mentor** to obtain feedback, and must be **uploaded to ELC**.

(CSEE/ELEE Project Groups) Midterm Project Presentation: 10/10 starting at 5pm. You must attend the session of your project mentor, (or the instructor assigned to the project mentor). You should prepare a 5 minute presentation including your response to client & mentor feedback.

(CSEE/ELEE Project Groups) Initial Design and Prototype: 11/28. By the end of the semester, you must complete an initial design (including analysis) and a "breadboard" implementation. In the second semester, you will develop this into a prototype. This must be delivered to your client and faculty mentor for feedback.

(CSEE/ELEE Project Groups) Semester Presentation: 12/11 @ 7:00PM (Finals Week) – You must attend the session of your project mentor, (or the instructor assigned to the project mentor). You should prepare a 5 minute presentation including your response to client & mentor feedback. A **video demonstration** (1 minute total) should be prepared and played during the presentation.

Grading:

- Design Notebook and progress reports (individual grade) 20%
- Midterm report (team grade) 15%
- Midterm presentation (team grade) 15%
- Final Design Report (team grade) 25%
- Final Design Presentation and Demonstration (team grade) 25%

The overall performance of the student will be evaluated against the extent to which you have documented your knowledge and skills in:

- 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.
- Written and verbal presentation quality

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.

Policies

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	