

- DESCRIPTION:** This is the first of the two-semester capstone design course for senior engineering physics and biomedical engineering majors. The purpose of the course is to integrate the principles of successful engineering design through implementation of a practical, real-world engineering design project. Prerequisites: To start this course sequence, a student should graduate in the 2016 calendar year. Students must follow this course in Spring 2016 with ENGR 4892 (Senior Engineering Design II).
- INSTRUCTOR:** Dr. Alaeddin Abuabed
Email – aabuabed@uco.edu
Office - Howell Hall 221S
Website – http://www.engineering.uco.edu/~aabuabed/index_files/seniordesign.htm
Phone – (405) 974-5934
- OFFICE HOURS:** MW @ 5:00-6:00 PM, T @ T 4:00-5:00 PM
 Other times by mutual arrangement – email for appointment.
- TEXTBOOKS:** **Practical Engineering Design**, Eds. M. Bystrom, B. Eisenstein (CRC Press, Clemson, SC, 2011) and **FE Supplied-Reference Handbook, 8th Ed.,**. This is also available as a free download for personal use only at <http://www.ncees.org>.
- ATTENDANCE:** Attendance is required and you are required to work on your project during the class time, the entire time from 1:00 -3:50 PM. Treat the weekly class meeting as a job with the course instructor as your boss. If you are going to be unavoidably late or miss a class (or have to leave early), like any employer your instructor will expect a telephone call or email explaining the reasons.
- GRADING:** Your final grade will depend on both your individual (50%) and team (50%) performance. This means your grade depends not only on how well you do as an individual, but also on how well your team as whole does. Grading is based on performance, not on effort. Each member of your project team will get the same team grade based on the project deliverables.

The criteria for assessment of the team are:

- 05% Class evaluation of your team (Form 07)
- 10% Weekly team meeting logs **[ML]** (Form 03)
- 10% Project proposal form (Form 06)
- 10% Literature research report (Form 09)
- 10% Course coordinator assessment of your Teamwork and professionalism
- 25% Project advisor assessment of your team (Form 04)
- 15% Project design report (Form 04)
- 15% Quality of final project presentation (Form 08)
- 100%

The criteria for assessment of individuals within the team are:

- 05% Attendance
- 05% Science Fair Participation (Form 11)
- 05% Team progress report presentation **[PR]**
- 15% Notebook (Form 02)
- 05% Professional membership
- 15% Weekly reports **[WR]** (Form 10)
- 10% Peer assessment of your Performance by other team members (Form 05)
- 15% Course coordinator assessment of your work
- 25% Faculty advisor evaluation of your work (Form 04)
- 100%

Your personal grade will start with the team grade, but may go up or down from the team grade based on your contribution to the project and your individual deliverables. For example, if your team receives a B, your grade will likely be anywhere between a C and an A. For another example, if your team receives a C for the team grade, it is extremely unlikely that you will get anything above a B for your own grade no matter how good your individual performance was. So what you should conclude from the grading policy is that it's to your benefit to make sure you have a high performing team.

Scale: A ≥ 90% > B ≥ 80% > C ≥ 70% > D ≥ 60% > F

PROFESSIONAL MEMBERSHIP

You will be required to satisfy one of the following:

1. Show evidence that you are a member of an appropriate professional organization, or
2. Write a 3-5 page typed report on the professional organization most appropriate for your degree that details how to become a member and the benefits provided by the organization.

ASSIGNMENTS:

Various assignments will due throughout the semester as given the course schedule and announced in class. There will be a 20% per day penalty for any work turned in after it is due.

FE Exam resources

<http://cdn2.ncees.co/wp-content/uploads/2013/10/Examinee-Guide-June-2014.pdf>

<http://ncees.org/exams/state-pages/oklahoma-exam-registration/>

Explore the new CBT:

<https://www.youtube.com/playlist?list=PLiZ0hjHNI9jzR8RW69ndkjlG8bzj0ew->

EE specifications: http://cdn3.ncees.co/wp-content/uploads/2013/10/FE-Ele-CBT-specs_with-ranges.pdf

ME specifications: http://cdn3.ncees.co/wp-content/uploads/2013/10/FE-Mec-CBT-specs_with-ranges.pdf

TIME COMMITMENT:

The expected time commitment is approximately 3 hours outside class for each hour in class. So you should expect to devote at least 12 hours per week to this course.

WEBPAGE:

I will be placing various forms, lecture notes and other materials on our course web page at http://www.engineering.uco.edu/~aabuabed/index_files/seniordesign.htm

PROJECT FINAL REPORT:

The final project report and presentation this semester should have a detailed technical description and demonstration of your project deliverable. It should clearly detail what was done and how your deliverable satisfies the objectives and criteria specified for it. In addition to the format and guidelines specified by your instructor, the following will be included in the final written reports. The main evaluation criteria will be:

- Demonstrate the ability to use modern engineering tools to model and simulate designs prior to actual prototype construction
- Modeling, analysis and hardware/software development
- Use of all applicable engineering standards
- Systems approach, design considerations and backup solutions
- Oral and written presentations, and actual system demonstrations
- Creativity and uniqueness from design concept to implementation
- Project progress, consistency and completion

PROJECT MANAGERS / TEAM LEADERS:

Each group will select a different team leader each month with each member of the group serving at least once as the project manager. The project manager will be the main contact for the group, will present the bi-weekly PowerPoint progress reports, function as liaison between the team and the faculty advisor, and be responsible for the internal communications within the group. The project manager rotation must be identified to the course instructor in the project proposal.

Responsibilities of the project manager include:

1. Insuring that deadlines are met
2. Insuring that the team is prepared for the weekly advisor meetings
3. Responsible for assembling and giving weekly team report
4. Responsible for competing and submitting all purchase requisitions
5. Responsible for logistics and confirmations associated with weekly team meetings, weekly advisor meetings, and all reports and presentations. This includes room and presentation equipment reservations.

UCO SYLLABUS ATTACHMENT¹:

A complete UCO Student information sheet, syllabus attachment, and ADA statement can be found at <http://www.uco.edu/academic-affairs/files/aa-forms/StudentInfoSheet.pdf>

DSS SERVICES:

The University of Central Oklahoma complies with Section 504 of the Rehabilitation Act of 1973 and the American with Disabilities Act of 1990. Students with disabilities who need special accommodations must make their requests by contacting Disability Support Services, at (405) 974-2516. The DSS Office is located in the Nigh University Center, Room 309. Students should also notify the instructor of special accommodation needs by the end of the first week of class.

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CELL PHONE & LAPTOP POLICY:

Unless you have received prior permission from your instructor, ALL ELECTRONICS must be turned off and put away during class sessions.

SPECIAL ACCOMODATIONS:

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TENTATIVE LECTURE SCHEDULE

WEEK	DATE(S)	LECTURE TOPIC / ACTIVITY	ASSIGNMENT DUE
1	Aug 18/ Aug 20	Introduction	
2	Aug 25/ Aug 27	Syllabus Teams and Projects	
3	Sep 1/ Sep 3	Progress Report (1)	WR (1) & ML (1) Due Monday Aug. 31 @ 5:00 PM
4	Sep 8/ Sep 10	Notebook	WR (2) & ML (2) Due Tuesday Sep. 8 @ 5:00 PM Project Initiation Form (Form 01) Due Sep. 8 @ 5:00 PM
5	Sep 15/ Sep 17	Progress Report (2)	WR (3) & ML (3) Due Monday Sep. 14 @ 5:00 PM Literature Research Report (Form 09) on Sep. 14@5:00 PM
6	Sep 22/ Sep 24	Library Training @ 2 pm	WR (4) & ML (4) Due Monday Sep. 21 @ 5:00 PM
7	Sept 29/Oct 1	Progress Report (3)	WR (5) & ML (5) Due Monday Sep. 28 @ 5:00 PM Project Proposal Form (Form 06) on Sep. 28 @ 5:00 PM
8	Oct 6/ Oct 8	Engineering Design	WR (6) & ML (6) Due Monday Oct. 5 @ 5:00 PM Notebooks (Form 02) Oct. 5 @ 5:00 PM
9	Oct 13/ Oct 15	NO CLASS	FALL BREAK!
10	Oct 20/ Oct 22	Progress Report (4)	WR (7) & ML (7) Due Monday Oct. 19 @ 5:00 PM
11	Oct 27/ Oct 29	TBA	WR (8) & ML (8) Due Monday Oct. 26 @ 5:00 PM
12	Nov 3/ Nov 5	Progress Report (5)	WR (9) & ML (9) Due Monday Nov. 2 @ 5:00 PM
13	Nov 10/ Nov 12	Making Technical Presentations	WR (10) & ML (10) Due Monday Nov. 9 @ 5:00 PM
14	Nov 17/ Nov 19	Progress Report (6)	WR (11) & ML (11) Due Monday Nov. 16 @ 5:00 PM
15	Nov 24/ Nov 26	NO CLASS	THANKSGIVING HOLIDAY!
16	Dec 1	Project Design Presentations	WR (12) & ML (12) Due Monday Nov. 30 @ 5:00 PM
17	Dec 8	Evaluation and Assessment	Project Design Report & Notebooks Due Tuesday Dec. 8, 2015 @ 1:00 PM

WR: Weekly Report

ML: Meeting Log

PR: Progress Report

Alignment of Course with Transformative Learning¹:

	Course Goal	Assessment Method
Discipline Knowledge	x	Project Report & Presentation
Leadership		
Problem Solving	x	Project Report & Presentation
Knowledge of contemporary issues.	x	Project Report & Presentation
Service Learning and Civic Engagement		
Global and Cultural Competencies	x	Project Report & Presentation
Health and Wellness		

Relationship of Course to Program ABET Outcomes²:

		None	Low	High	Assessment Method
a	Ability to apply mathematics, science, and engineering principles.			x	Project Report & Presentation
c	Ability to perform engineering design subject to multiple constraints			x	Project Report & Presentation
d	Ability to work in teams			x	Project Report
e	Ability to solve engineering problems			x	Project Report & Presentation
g1	Ability to effectively communicate - oral			x	Project Presentation
g2	Ability to effectively communicate - written			x	Project Report & Presentation
k	Ability to perform independent investigation			x	Project Report & Presentation

¹Required by University.

²Required by Department.