

Senior Clinic 2 – ENGR 432, Section 01

Abilene Christian University

Credit Hours: 3

Semester and Year: Spring 2016

Pre-requisites/co-requisite: Completion of ENGR 430 with a grade of C or higher.

Class Meeting Times and Location

Lecture Tuesday and Thursday in Bennett 233 from 12:00pm to 1:20pm

Laboratory Tuesday in Bennett 114 from 1:30 pm. to 4:20 pm

The final exam is scheduled for 10:00 to 11:45 am on Tuesday May 3, 2016.

Required Text and Software

NONE

Catalog Description

The second of a two-course senior-level engineering design experience. Students will engage in team based professional level engineering design projects using design procedures to develop specifications, alternate solutions, and engineering drawing and plans while considering external constraints. Using engineering design procedures students complete a prototype of the design created during the first part of the design sequence (ENGR 430). **A writing-intensive course. Contributes to completion of university capstone requirements.**

Intended Audience

This is a required course for engineering majors and intended to be completed during the spring semester of the senior year.

Contact Information

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Office Hours: M (10:00 -11:00 am) T (1:30-2:30 pm) W (10:00 – 11:00 am and 1:30 – 3:30) and Friday (1:30 – 3:30 pm). Additional office hours can be arranged as needed.

TEACHING PHILOSOPHY

Engineering is a well-respected profession. The public entrusts engineers to be honest, competent, and ethical. Many codes of ethics for these fields indicate that the commitment to protecting the health, safety, and welfare of the public is of paramount importance. These values are in harmony with Christian principles and ideals. Christian engineers should be honest (Matthew 5:37), work hard to ensure competency (Colossians 3:23), and put the public's interest ahead of his or her own (Luke 6:31). In light of these principles, this course will be taught such that you will gain an appreciation for the professional nature of engineering. It will be taught so as to give you every opportunity to begin to develop competency in these fields. This will require homework, quizzes, test, and group discussion. The instructor especially encourages the discussion of topics that would bear on integrating faith and

professional responsibilities (cheating on licensure exams, weapons design and manufacture, environmental laws and employment opportunities in developing nations, etc.)

Learning Objectives

The activities of the course support the assessment of the following ABET Outcomes:

Criterion 3

3(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic environmental, social, political, ethical, health and safety, manufacturability, and sustainability

3(d) an ability to function on multidisciplinary teams

3(g) an ability to communicate effectively

3(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.

ABET Learning Objectives	Course Competencies	Measurement ¹
3(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic environmental, social, political, ethical, health and safety, manufacturability, and sustainability	Creatively apply systematic design process to a real-world problem	Draft and Final written reports
	Develop, evaluate, and synthesize alternate design solutions	Draft and Final written reports
3(d) an ability to function on multidisciplinary teams	Work productively as a member of an engineering design team	Team Member Assessments
	Interface effectively with clients and professionals in industry,/government/education	Draft and Final written reports
	Create and communicate professional, interdisciplinary ideas	Draft and Final written reports Oral Report Team Member Assessments Weekly Progress Reports
3(g) an ability to communicate effectively	Create professional written responses and reports constructed from technical publications and sources	Draft and Final written reports Statement of Faith ²
3(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.	Utilize problem-solving and core engineering education to discover best practices and solutions for the design sponsor	Draft and Final written reports Oral Report Team Member Assessments Economic Analysis
	Utilizing the sponsor identified constraints and professional standards to shape and evaluate the results of the design process	Problem Statement Draft and Final written reports

¹ For sake of consistency, many submitted items will be assessed using a rubric developed by a faculty committee.

²The Literature Review and Statement of Faith will be submitted in partial fulfillment of university capstone requirements.

Description of activities students should expect in the course

Each student will be part of a design team. Course activities will include these and more over the course of the semester: presentations regarding professional practice standards, presentations and discussions regarding various stages of design project management and reporting, team and individual work on the design project, research online and/or in the library for literature related to the project, consultation with faculty and project customers about the project, preparing and presenting a variety of written and oral work products, and the iterative process of designing, building, testing and improving physical devices intended to meet project specifications defined by the customer. Success in this course will require a great deal of independent work focused on project-related tasks.

GRADING POLICY

Weekly Activity Reports – (16 reports x 10 points = 160 points)

Each project team is responsible to submission of weekly activity reports identifying concerns, indicating progress, and outline current plans for the project. Additionally, each team member will report their weekly time commitment to the project rounded to nearest 0.25 hour. Weekly Activity Reports are due each Friday (Electronically).

Participation/Attendance (50 points team assessment and 50 points faculty assessment and attendance record)

Part of your final grade in this course will depend upon your attendance and your respectful participation during class. Faculty assessments will be based upon student's professional characteristics including punctuality, attendance, collegial attitude, and participation. Participation may be evaluated at any time during class, students, either individually or as a group, are subject to be requested to participate in class discussions, demonstrations, and written exercises. Evaluations of each team member will be made by all members of the team regarding the contributions made by the team member.

Draft Reports (2 draft reports x 50 points=100 points)

Two draft submissions of design project report are required during the semester to evaluated team progression and conformance to format and content requirements. Submission of a draft design project report includes posting to the project website hosted by the department.

Economic Analysis – (150 points Total, 50 points draft report and 100 points final report)

Each team will develop an economic analysis for their final design, in addition to submission of a draft of a design economic analysis. The analysis will include total costs, complete parts lists, labor requirements, and both two professional documents for distribution to project sponsors and external project evaluators. The Scope of Work and Problem Statement and Statement of Qualification format will reflect the professional standards of the specific engineering industry of the project sponsor and/or external project evaluator. Submission of the draft and final economic analysis includes posting to the project website hosted by the department.

Statement of Faith (100 points)

Each team member will submit an essay statement of reflecting on her or his integration of faith and engineering. (For satisfaction of University Capstone requirements)

Final Design Submission (300 points)

Each team submit their design working prototype of their selected project. For full consideration As-Built plans must be included with submissions along with verification of prototype testing, and both must be posted to the project website hosted by the department.

Final Written and Oral Presentation Submission – (300 points total, 150 each)

During the final examination time each project design team will submit their final written design report along with an oral presentation of the design detailed in the written report. Submission of the final written design report includes posting to the project website hosted by the department.

Calculation of Final Course Grade-

Weekly Activity Reports.....	160 points
Draft Reports.....	100 points
Statement of Faith.....	100 points
Participation/Attendance.....	100 points
Economic Analysis	150 points
Final Design Prototype	300 points
Final Written Design Report.....	150 points
Final Oral Design Presentation.....	150 points
Total Points	1,210points

90% and above	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
59% and below	F

ACADEMIC INTEGRITY POLICY

Academic integrity is defined as academic work completed as assigned for each class by the individual or group responsible for the work. Violations of academic integrity and other forms of cheating involve the intention to deceive, mislead, or misrepresent and therefore, are a form of lying. Such actions are contrary to behavioral norms that flow from the nature of God. Academic misconduct includes, but is not limited to, the following: 1) Failure to give credit to sources used in a work in an attempt to present the work as one's own, 2) Submission of papers or projects obtained from another source (e.g., research service or club paper file) as one's own, and 3) Falsifying information orally or in writing. Academic misconduct may result in, but is not limited to, a zero on the assignment and/or an F in the course. Additionally, the department chair, Dean of the College of Arts and Sciences, and the Dean of Student Life will be notified. See the full university policy, including how to appeal a decision, by following this link:
<http://www.acu.edu/campusoffices/studentlife/judicialDocuments/AcademicIntegrityPolicy.pdf>.

ADA COMPLIANCE STATEMENT

“Abilene Christian University is dedicated to removing barriers and opening access for students with disabilities in compliance with ADA and Section 504 of the Rehabilitation Act. The Alpha Scholars Program facilitates disability accommodations in cooperation with instructors. In order to receive accommodations, you must be registered with Alpha Scholars Program, and you must complete a specific request for each class in which you need accommodations. If you have a documented disability and wish to discuss academic accommodations, please call our office directly at 325-674-2667.”

THE MISSION OF ACU:

To educate students for Christian service and leadership throughout the world.

THE MISSION OF THE COLLEGE OF ARTS AND SCIENCES:

The College of Arts and Sciences engages students with humanity’s greatest ideas to create understanding, apply insights, and serve the world as Christian thinkers and problem solvers.

THE MISSION OF THE ENGINEERING AND PHYSICS DEPARTMENT:

The ACU engineering program strongly supports the university's mission of educating students for Christian service and leadership throughout the world. In support of this mission, ACU engineering graduates will attain:

- a deep and broad understanding of engineering principles and practices as evidenced by professional employment, continued professional development, and graduate study in engineering or other professional fields.
- an extensive knowledge of the innovative design processes unique to engineering professionals as demonstrated by using critical thinking skills to contribute to the scientific and technical literature, patents and intellectual property, professional societies, and creative designs.
- a thorough understanding of Christian service and leadership as shown in their commitments to professionalism, ethics, and service and leadership within the engineering profession, the church, and society.

COURSE SCHEDULE (Instructor reserves the right to modify the course schedule as necessary)

Week	Date	Topics/Activities	Assignment Due
1	1/11/2016	Syllabus and semester scheduling	
	1/13/2016	Fabrication Practices, Procedures, and Culture of Safety	Weekly Activity Report
2	1/18/2016		
	1/20/2016	Fabrication Practices, Procedures, and Culture of Safety	Weekly Activity Report
3	1/25/2016		
	1/27/2016	Interviews	Weekly Activity Report
4	2/1/2016		Statement of Faith
	2/3/2016	Mock Interviews	Weekly Activity Report
5	2/8/2016	Engineering Ethics	
	2/10/2016	Engineering Ethics	Weekly Activity Report
6	2/15/2016	Faith and Practice	Design Economic Analysis Draft
	2/17/2016		Weekly Activity Report
7	2/22/2016	Team building exercise	Written Report Draft
	2/24/2016		Weekly Activity Report
8	2/29/2016	Presentation Practice Day	Statement of Faith
	3/2/2016	Economic Analysis Review	Weekly Activity Report
9	3/7/2016	Professional Development Guest Lecture	
	3/9/2016	Professional Licensure	Weekly Activity Report
10	3/14/2016	Spring Break	
	3/16/2016	Spring Break	Weekly Activity Report
11	3/21/2016		Economic Analysis Draft
	3/23/2016	Work Place Stress	Weekly Activity Report
12	3/28/2016	Professional Development Guest Lecture	2nd Written Report Draft
	3/30/2016	Social Media and Professional Conduct	Weekly Activity Report
13	4/4/2016	Professional Development Guest Lecture	
	4/6/2016	Social Media and Professional Conduct	Weekly Activity Report
14	4/11/2016	Professional Development Guest Lecture	
	4/13/2016	Continuing Education	Weekly Activity Report
15	4/18/2016		
	4/20/2016	Project Work Day	Weekly Activity Report
16	4/25/2016		
	4/27/2016	Project Work Day	Weekly Activity Report
17	5/2/2016	Dead Day	
	5/4/2016	Final Presentation of written and oral design report (10:00- 11:45 am)	Weekly Activity Report

Laboratory periods are scheduled for team project work, instruction during these periods will be as needed to address project challenges as they arise.