

Biological Engineering 4292
Senior Engineering Design and Professionalism Laboratory
Credit Hours: 2 (6 hours lab)
Spring Semester 2012
4:30 – 7:30 p.m., Monday, 4:30-7:30 p.m. Wednesdays (meeting time)
Room 102 Tureaud

Instructor: Daniel Hayes, Ph.D., Room 167 E.B. Doran Building, phone: 578-2919, e-mail: danielhayes@lsu.edu. Office hours: T-Th 3:30-4:30 pm by appointment.

Course Description: Engineering principles used to complete the project set forth in the design outline submitted in BE 4290; design project completion.

Prerequisite: BE 4290

Objectives:

- To become proficient with basic components of experimental design and testing
- To build and test a working prototype of the design you developed in BE 4290
- To effectively present the working prototype of your design to faculty, students, and the public through an oral presentation and a poster presentation
- To work effectively in teams to submit a professional quality technical report to the Gunlogson Design Competition that describes your design and details the building and testing of this design.

Accreditation: The Accreditation Board of Engineering and Technology (ABET) has established criteria through which engineering programs, including this one, are accredited. When you complete the Biological Engineering curriculum at LSU, you should be proficient in the objectives listed below. BE 4292 is intended to help you “tie together” all your basic and applied engineering courses in a project-based, pre-professional engineering experience and will assist your mastery of these objectives:

- (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, an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Required Text: Engineering Design (4th Edition), by George Dieter

References:

- A Mechanical Design Process, by David Ullman
- Creative Problem Solving and Engineering Design, by Edward Lumsdaine, Monika Lumsdaine, and J. William Shelnut
- Fundamentals of Engineering Reference Manual, Michael Lindeburg
- Fundamentals of Engineering Supplied Reference Handbook, National Council of Examiners for Engineering and Surveying
- Strategies for Engineering Communication, by Susan Stevenson and Steve Whitmore

Grade Breakdown:

Homework	20%
(includes progress reports, design notebook, interim oral presentation grades)	
Final written report	10%
Final poster and presentation	35%
Individual grade	35%
(assigned by instructor in consultation with faculty advisor(s))	

Late homework assignments will receive 10% off for each day they're late (20% if one day late, 40% if two days late, etc.). Assignments are due by 4:00 p.m.

Course grades will be determined on the following scale: A (90 – 100%), B (80 – 89.9%), C (70 – 79.9%), D (60 – 69.9%), F (<59.9%). Remember, if you are on the border between letter grades, coming regularly to class, participating in class, and following class rules (see below), you will get you the higher letter grade.

There will be no exams or quizzes in this course!

Progress reports are an essential component of this course. They will assist you, your project advisor(s), and me in keeping better track of your progress as a group. The progress report should be in memorandum format and will be addressed to me and your senior design advisors, from your group, regarding your senior design project. You will summarize your activities and progress on your project in the body of the memo; this should not exceed one page. In addition, each group member must write a paragraph in which s/he details his/her work during the progress period! These should be attached to the memorandum, and you as group members should sign the memo **ONLY AFTER** you have read every group member's explanation of their individual activities. **IF YOU DISAGREE** or take issue with what you and/or your group members have written, send your group members an e-mail and cc your advisor(s) and me. We will have a meeting immediately to address any issues or conflicts that arise. I will assign a progress report grade (which counts toward your homework grade) **AND** an individual grade (which counts toward the final grade) for each progress report period. **ALL MEMOS REQUIRE EVERYONE'S SIGNATURES!!!** Progress reports should be submitted to Angie in the front office by 4:00 pm of the day they're due.

Design notebooks. You must add 25 high quality entries (minimum) to the design notebook that you compiled in BE 4290.

Communication Across the Curriculum. LSU has implemented a Communication Across the Curriculum Program (CxC) to improve the communication skills of students at this university.

This course is certified as a "Communication-Intensive Course" and meets all of the requirements explained on the CxC Web site: <http://cxc.lsu.edu>, including the following: Emphases on formal and informal assignments in written and visual communication, class time spent on communication, 40% of the final grade based on communication projects, revisions after faculty feedback on 2 formal projects (one for each emphasis), and a student/faculty ratio of 35:1. Because it meets these requirements, students may count it toward "Distinguished Communicator" certification on LSU transcripts.

A visit to the CxC studio to fine tune your final presentation will also be required.

Final comments:

Once again, I will do everything I can to make each of you shine in this course! This is it, folks!!! Senior design is extremely important and can have a huge impact on what kind of job you take, what sort of graduate/professional work you do, etc. I am honored to be your instructor in your first *and* one of your last year of this curriculum! Remember class rules!

- Turn off your cell phone before class starts!
- Cheating and plagiarism will not be tolerated under any circumstances!
- Be respectful of yourself and each other (don't interrupt each other, listen to each other, seek to understand before being understood, and so on)
- Bring questions and comments to class; on-going dialogue about engineering, design, and professionalism will enrich your experiences in this course and will help your design project!
- Teamwork is the key to success in this course!
- If you have trouble with your teams, try to work within your team first. If the issue doesn't resolve, please consult with me and your project advisor immediately.
- **Remember to check your e-mail regularly for messages from me! This is especially important since we won't be meeting as regularly as we did in BE 4290!**

Approximate schedule (subject to change!)

- 1/18 Going over the syllabus
- 1/25 Class
YOUR MATERIALS SHOULD BE ORDERED BY THIS POINT!!!
Progress report #1 due
- 1/27 **FE Exam registration deadline #1, see www.lapels.com for details**
- 2/1 Class
- 2/8 Oral presentations on design project progress
- 2/15 Oral presentations on design project progress
- 2/22 **Mardi Gras!!!!!!**

- 2/23 **FE Exam registration deadline #2, go to www.ncees.org/ and follow the directions to register for the exam.**
- 2/29 Class
Progress report #2 due
- 3/7 Class
- 3/14 Class
**YOUR DESIGN SHOULD BE IN PHYSICAL EXISTENCE AT THIS POINT,
AND YOU SHOULD BE TESTING IT!!!
Progress report #3 due**
- 3/21 Oral presentations on design project progress
- 3/28 Oral presentations on design project progress
- 4/4 Class
- 4/11 **Spring Break!!!!**
- 4/14 **FE exam!!! Go get it!**
- 4/18 Poster Review
Progress report #4 due
- 4/23 Final Presentation Review (Long Run)
- 4/25 Final Presentation Review (Long Run)
- 5/2 **Final design presentations**
- TBD Final exam: **Final paper due
Design notebook due**

Class party (date to be determined)