

FORT LEWIS COLLEGE
Department of Physics and Engineering

Course: ENGR/PHYS 496 – Senior Seminar/Design

Term: Fall 2015

Instructor(s):

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Textbook:

A Guide to Writing as an Engineer, 3rd Edition, David Beer and David McMurrey

COURSE INFORMATION

Catalog description:

Students experience the integration of technical knowledge through an open-ended, comprehensive design project which simulates an engineering project environment, including design, building or simulations, testing and verifications, project management, oral and written reports, and professional ethics. Students are required to take the Fundamentals of Engineering exam.

Course Objectives:

Develop competence with the elements of engineering design with a special emphasis on: the design process, technical writing, presentation skills, project management, and professionalism.

Prerequisites:

Engr 315 – Engineering Design and Practice

Required Course: (Lect-Lab): (3-0)

This is the first of a two course design/research sequence. The process is completed in Engr/Phys 497. Engineering students are required to take the Fundamentals of Engineering (FE) exam.

COURSE OUTCOMES:

ABET Criterion-3 lists 11 learning outcomes titled a-k. This course addresses the following subset of these outcomes.

- (c) An ability to design a system, component, or process to meet needs with realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- (d) An ability to function on multidisciplinary teams
- (f) An understanding of professional and ethical responsibility
- (g) An ability to communicate effectively

TOPICS

- The engineering design process

- Problem definition
- Generating design alternatives
- Evaluating design alternatives and down-selection
- Working as a member of a design team
- Applying project management concepts
- Preliminary and critical design reviews
- Professional ethics in design and practice
- Safety standards
- Prototyping, testing and evaluation
- Documentation - oral and written reports

Design Projects: The Senior Design faculty carefully chooses projects that have genuine application in the practice of engineering. Student teams for each project are selected by a panel of outside engineers and/or faculty members, using a merit based application process similar to that found in industry.

Class Format:

Fall term: Course assignments are as stated on the published Fall term schedule (below).

Spring term: Five clearly-defined, critical milestones off each design team's Gantt chart or other scheduling tool must be accomplished according to schedule. It is the responsibility of the teams to propose which milestones are critical, and when they will be completed to their advisors. Each team advisor will then have the option to approve the milestones and schedule, or ask for alterations.

Teams will be randomly chosen on a weekly or bi-weekly basis (at the discretion of the instructors) to publicly demonstrate the achievement of scheduled assignments/milestones in front of the ENGR496/7 student body and instructors on the class session on or immediately after the scheduled date. If a team does not have that assignment/milestone accomplished, the team members **will lose one letter grade off their final semester grades** (Fall or Spring term as appropriate). If the team believes that the delay was unavoidable, a member of the team, chosen at random by the team advisor, may publicly present their appeal to the ENGR496/7 student body and instructors during the class session that they were originally scheduled to demonstrate their assignment/milestone accomplishment. The instructors will then collaborate and vote to determine if the letter grade will be reinstated. Documentation of the unavoidable cause of delay and documentation of an advance warning of the delay to the team's advisor is a requirement to make an appeal.

All submitted assignments will require an electronic upload (see Canvas for details)

It is the students responsibility to keep track of all due dates. All assignments are to be typed or prepared using applicable engineering design tools, and in final engineering format. Writing must be professional quality and follow the program standards. For guidance see: *A Guide to Writing As an Engineer* / Edition 3, by David F. Beer, David McMurrey, 3rd Edition, ISBN:0470417013, Wiley, John & Sons, 2009.

Grading:

Grades are based on project work, participation and professionalism. Project work assessment includes the quality of deliverable products, the ability effectively apply the formal design process and the ability

to meet project based goals and deadlines. Participation and professionalism includes assessment of the level of engagement in the project and professional conduct.

Graded project work is listed below with the relative weights

Project Work	Points	
Resume and cover letter	50	
Problem Definition Statement	50	
WBS/LRC/Gantt	50	
Funding Proposal	75	
PDR	200	
Draft Final Report	200	
Participation	100	(based on peer reviews and instructor observations)
Professionalism	100	(based on instructor observations, peers, and applicable project clients.)

Grades will be no worse than:

- >90% - A
- >80% - B
- >75% - C
- >60% - D
- <60% - F

Course Attendance: Scheduled course attendance is mandatory. Class meeting times have been selectively scheduled to meet once or twice a week as noted on the seminar schedule. Students are asked to clear their work/personal schedules accordingly.

Honesty Policy – The department maintains an honor code under which you are expected to meet the highest standards of personal, academic and professional ethical and moral conduct. These standards require personal integrity, a commitment to honesty by following the rules set forth in all of your courses, and to hold others accountable for said standards. The absence of these standards undermines the academic process and sets the stage for failure in your professional life.

Special Needs Accommodations: In accordance with the policy of Fort Lewis College any student in need of special accommodations based on a documented disability will be given appropriate consideration. Please speak with the instructor and contact Dian Jenkins, Disability Services Coordinator, Phone: (970) 247-7459.

Department Policies: For policies on grading, syllabus changes, disputes with instructor, academic dishonesty, and other important issues see the Physics and Engineering Department Policies document on the course Canvas page.

**Engr/Phys 496 Senior Seminar – Design/Research
Course Schedule**

Wk	Date	Seminar Topic and Time (if not noted, class meets from 3:35-6:30pm)	Assignments (due on date noted – see Canvas for time)
1	9/2	Course outline, schedule, procedures (Nollet) 3:35-4:30	Formal resume and project position application/cover letter, 9/2.
	9/4	Project interviews (3:35-5:00 pm)	Project interviews, 9/4
2	9/9	FE exam registration (Williams) Form teams, 3:35-5:30 pm	Initial meeting with your project team, 9/9
	9/11	Team Charters, 3:35-4:30 pm	Team charter, 9/11
3	9/16	Preparing a resume and cover letter (Career Services) Revised Problem Statement/Definition, 3:35-5-30 pm	Revised problem definition, 9/16
	9/18	3:35-4:30 pm	Revised resume and cover letter, 9/18
4	9/23	Background/Lit Review (Smith) Work breakdown, Linear Responsibility Chart, Gantt Chart/Scheduling	WBS/LRC/Gantt, 9/23
5	9/30	Funding proposal, (Paciaroni)	Report: background & literature review, due 9/30
6	10/7	PDR process review (Leahy)	Draft 1 Funding Proposal, 10/7
7	10/14	Funding proposal distributed for review	
8	10/21	Funding Proposals	Final/Revised Funding Proposal, 10/21 5 min Funding Proposal Presentation, 10/21
9	10/28	PDR, 3:35-5:30pm	
	10/30	PDR, 3:35-5:30 pm	
10	11/4		
11	11/11	Down select	Down select, 11/11
12	11/18	Resource needs and purchase requests	Purchase requests, 11/18
Thanksgiving Break, 11/23 – 11/27			
13	12/2		
14	12/9	Testing Plans	Testing Plans, 12/9 Draft final report – compilation of documents
15	12/17	Final Exam, 12/17, 9:45-11:45	Project Demo or Similar