
EML 4551
ETHICS & DESIGN PROJECT ORGANIZATION
Spring 2012

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Department of Mechanical Engineering
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www.eng.fiu.edu/mme/robotics

Course Description:

Synopsis: Senior design project organization to include problem definition, goals, survey, conceptual and preliminary design, ethics and cost components, social and environmental impact, presentation to enhance communication skills.

Senior design teams will be organized, initial design work will be completed, and the teams will be prepared to complete the work in the following major semester.

Design teams will develop senior design project topics, set specific but realizable goals (also called metrics), conduct in-depth literature survey including a multi-national and multi-cultural dimension, complete the conceptual and preliminary design phases, feasibility study, ethics and cost components, social and environmental impact, and evaluation of proposed designs with an international perspective.

Teams will make several presentations during the semester to enhance their communication skills. The final presentation will be presented to the departmental Industrial Advisory Board for their evaluation of the proposed project.

In addition, engineering ethics case studies will be covered. This course will also discuss the impact of proposed solutions in different regions of the world and possible adjustments in design so that the final product is successful regardless of the location it is produced or sold. Hence, this is a global learning course that counts towards the global learning graduation requirement.

Furthermore, students will be given the nationally-administered Fundamentals in Engineering (FE) style exams to assess their preparedness for the senior design project.

Co-requisites:

EGM 3311 Analysis of Engineering Systems,
EML 3500 Mechanical Design I,
EML 4140 Heat Transfer, and senior standing.

Lectures:

R 2:00-3:15 pm, EC 1105.

Office Hours:

R 4:00-5:00 pm. For other times, by appointment via e-mail.

Reference Books (Students are not required to purchase these books):

FE Review Manual, Michael R. Lindenburg.

NCEES Fundamentals of Engineering Supplied-Reference Handbook, 7th Edition,
NCEES. (This will be made available in pdf format.)

Course Outline:

- Assessment of educational engineering background in terms of FE style exams
- Review of engineering ethics; review and discussion of ethics case studies
- Global engineering: Global awareness, global perspective and global engagement practices; review and case studies
- Review of possible areas for senior design project
- Team presentations on selected topics, timeline, division of responsibilities, literature survey, alternate designs, initial structural design, 1-page project synopsis, 10% and 25% senior design team reports
- Preparation of professional team poster describing the senior design project
- Final team presentation to the Industrial Advisory Board and Mechanical Engineering faculty

Course Objectives:

- Assessment of educational engineering background
- Engineering ethics, case studies
- Global engineering perspective, case studies
- Senior design team formation, selection of faculty advisors and topics
- Completion of literature survey, alternate designs and initial structural design

Course Learning Outcomes:

I. Global Learning Course Outcomes:

1. Students will be able to identify, analyze and integrate ethics similarities and differences in multiple markets and cultures.
2. Students will be able to conduct an analysis of an engineering problem and its global impact by identifying different factors such as technology, economics and society, and their contributions to the problem and/or solution.
3. Students will be willing to work in teams to develop solutions and action plans to address local, global and/or international engineering problems.

II. SACS Learning Outcomes - ABET Program Outcomes Supported by the Course:

Mechanical Engineering program outcomes supported by this course:

- (a) Ability to apply knowledge of mathematics including statistics, multivariable calculus and differential equations, science including physics, and engineering
- (c) Ability to design a system, component, or process to meet desired needs
- (d) Ability to function on multi-disciplinary teams
- (e) Ability to identify, formulate and solve engineering problems
- (f) Understanding of professional and ethical responsibility
- (g) Ability to communicate effectively
- (h) Broad education necessary to understand the impact of engineering solutions in a global and societal context

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

Note Regarding SACS Learning Outcomes - ABET Program Outcomes:

SACS Learning Outcomes/ABET program outcomes are defined for the MME program that must be achieved by graduating students. Each course supports several of the outcomes incrementally but must not necessarily achieve them fully.

Grading:

Activity	Percent
Attendance	5%
Ethics Case Assignments + Technical Writing	5%
Global Learning Case Assignments + Technical Writing	5%
<u>FE Style Exam (Only NCEES Reference Handbook Allowed)</u>	
FE Exam 1: Math	4%
FE Exam 2: Statics, Dynamics, Mechanics of Materials	4%
FE Exam 3: Fluids, Thermodynamics, Chemistry	4%
FE Exam 4: Materials, Circuits, Computers, Economics, Ethics	4%
FE Comprehensive Practice Exam	4%
FE Comprehensive Final Exam	10%
10% BS Thesis - Team Report	10%
25% BS Thesis - Team Report	20%
Team Poster	10%
Final Team Presentation to the IAB	15%

Note that each team will make 5-minute formal presentation to the Industrial Advisory Board and ME faculty on Wednesday, April 18, 2012 in EC 2300.

Rehearsal presentations will take place on Wednesday, April 11, 2012 in EC 2300.

All team reports should use the “Senior Design Final Report – BS Thesis” format and include all required sections that contain literature survey, alternate designs, initial structural design, prototype design, cost analysis, hours spent individually and as a team, discussion and conclusions, reference list, engineering drawings, etc.

Students are required to read and consistently apply technical writing rules described in the document “Style Guide for Technical Report Writing” available at the course site.

Exams:

Only the following calculators will be allowed during exams:

- Casio: All fx-115 models. Any Casio calculator must contain fx-115 in its model name.
- Hewlett Packard: HP 33s and HP 35s models, but no others.
- Texas Instruments: All TI-30X and TI-36X models. Any Texas Instruments calculator must contain either TI-30X or TI-36X in its model name.

Students can use only their own calculator and a copy of the NCEES Reference Handbook.

No material can be shared between students. Cell phones, computers, mp3 players and electronic devices cannot be used in the classroom – during lectures, quizzes or exams.

Bonus Grade:

LinkedIn provides a basis for professional networking and many of our students have gained new professional contacts via the LinkedIn account. Hence, our presence in this professional community improves our department’s profile and allows new opportunities to our students.

Students who create an account at LinkedIn and connect their account with Dr. Tosunoglu (tosun@fiu.edu) will receive a full FE exam grade which will replace the lowest of the FE Exam 1, 2, 3, or 4 grade. That is, comprehensive practice exam or comprehensive final exam grades will not be affected by this policy.

Make-up Exams:

Make-up exams will be allowed only after the student provides a medical doctor’s original report describing the problem and a statement that it was an emergency. The report must include the doctor’s address and phone number. The Department will contact and verify the situation before a test day is scheduled.

Late Reports:

Project and report due dates will be strictly enforced. Late project submissions will not receive full credit, and the following policy will apply: Submissions after the class hour on due date or the following day will lose 10 points out of 100. Submissions on the second or third day after the due date will lose 10 additional points each day.

Attendance:

Attendance will be monitored throughout the semester.

Ethics:

All work prepared and submitted in this course in the form of projects, presentations, problem solutions in quizzes and exams are expected to be original and produced by the submitting student. Any portion that may have been borrowed from a previous work must be clearly identified and referenced to indicate the original author along with the title of the work, and where and when it appeared. It is extremely important to realize that not doing so may result in an accusation of plagiarism.

Projects must contain the following statement and include each team member's signature:

Authors' Ethics Statement:

The work submitted in this project is solely prepared by NAME LASTNAME 1, NAME LASTNAME 2, and NAME LASTNAME 3, and it is original. Excerpts from others' work have been clearly identified and listed in the list of references. All of the engineering drawings, computer programs, formulations and related files submitted on the accompanying CD are also original and prepared by NAME LASTNAME 1, NAME LASTNAME 2, and NAME LASTNAME 3.

NAME AND LASTNAME OF EVERY TEAM MEMBER

(Include Signature of Each Team Member)

Plagiarism Prevention at Turnitin.com

Final versions of 10% and 25% reports as well as the 1-page project synopsis (to be submitted to the Industrial Advisory Board) will be submitted to www.turnitin.com to be evaluated against plagiarism.

The site compares the submitted document for similarities against the works published by others and assigns a similarity index. Lower similarity percentages (0 to 10%) indicate less similarity and are interpreted as good. Higher percentages mean that plagiarism is likely and your report grade will be adversely affected.

Each team is required to upload their reports by one team member since multiple entries of the same report result in very bad similarity indices for later submissions. In order to improve the similarity index, the same team member will be permitted to resubmit the revised report before the deadline expires.

You can submit your reports to www.turnitin.com by using the following information:

Course ID: 3133007

Password: SnrDesignOrg

Correspondence via E-mail:

Each student is required to provide a reliable e-mail address for correspondence. Various announcements and reminders will be sent via e-mail throughout the semester.

Students are expected to check their e-mail regularly and make sure their inboxes are not full as the bounced mail messages will not be sent again.

Incomplete Grades:

A grade of “incomplete” will not be assigned to replace an unwanted grade. In order to be eligible to receive “incomplete,” only a single component of the entire coursework needs to be missing. The reason for failure to fulfill the requirement in time must be officially proved by the student (e.g., a medical doctor’s official letter), and verified by the Department in order to receive an “incomplete” grade.

The University requires that a student must fill out an “Incomplete Grade Form” before the incomplete grade is assigned. The form will be signed by the student and the professor before such grade is assigned.

Academic Misconduct:

Academic dishonesty is a serious offense and will be treated according to the University policy as outlined below.

Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, rigorous and respectful exchange of ideas, and community service. All students should respect the right of others to have an equitable opportunity to learn and honestly to demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Handbook.

**OVERVIEW OF ACTIVITIES AND DEADLINES
FOR EML 4551 - SPRING 2012**

EML 4551 • Ethics and Design Project Organization • Spring 2012	
Date	Activity
Thursday, January 12	Intro, Project Topics, Teaming
Thursday, January 19	Project Topics, Global Learning Case Study, GL Assignment
Thursday, January 26	Project Topics, Ethics Case Study, Ethics Assignment
Thursday, February 2	FE Exam 1: Math
Thursday, February 9	FE Exam 2: Statics, Dynamics, Mechanics of Materials
Thursday, February 16	Formal Team PowerPoint Presentations: Intro to Senior Design Projects
Thursday, February 23	FE Exam 3: Fluids, Thermodynamics, Chemistry
Thursday, March 1	FE Exam 4: Materials, Circuits, Computers, Economics, Ethics
Thursday, March 8	One-Page Project Synopsis Due (to be sent to IAB members for feedback) Formal Team PowerPoint Presentations: Description of GL Components in Senior Design Projects
Thursday, March 15	Spring Break
Wednesday, March 21	Final Report Due – 10% Completed
Thursday, March 22	GL/Ethics Case Study Softcopy of Team Poster Due
Thursday, March 29	GL/Ethics Case Study
Wednesday, April 4	Final Report Due – 25% Completed
Thursday, April 5	In-Class Team Presentation Rehearsals Softcopy of Final Revised Team Poster Due
Wednesday, April 11	Rehearsal Team Presentations, EC 2300
Thursday, April 12	FE Practice: Comprehensive FE Exam
Monday, April 16	Printed Team Posters Due
Wednesday, April 18	Final Team Presentations to the IAB, EC 2300
Thursday, April 19	GL/Ethics Case Study, Review
Thursday, April 26	Final Exam, Comprehensive FE Exam, 12:00 – 2:00 pm, EC 1110