ENES 100 - Introduction to Engineering Design
Fall 2021

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Office Hour (In-person at CSC 339B or Cisco WebEx): Mon 1:30-3:30 pm & Tue-Thu 1:30-3:00 pm. Cisco WebEx: https://frostburg.webex.com/meet/tcadenazzi
Eric Moore, Ph.D. (Lab Classes); ejmoore@frostburg.edu;
Office Hour (In-person at CSC 122 or Cisco Webex): Mon 2:15-3:15pm, Tue 10am-12pm, Wed 2-3pm, Thu 9:30-10:30am. Cisco Webex: https://frostburg.webex.com/meet/ejmoore
Duane Miller (Lab Manager); dmiller@frostburg.edu.

Textbook: Thinking Like an Engineer: An Active Learning Approach, 4th Edition, by Elizabeth A. Stephan, David R. Bowman, Boeing, Boeing, William J. Park, Benjamin L. Sill, Clemson University, and Matthew W. Ohland.

Facultative: Design Concepts for Engineers, 5th Edition, by Mark N. Horenstein, Boston University

Course Description

Introduction to the engineering design process, computer software for word processing, spreadsheet, CAD and communication skills. Students work as teams to design and build a project.

Prerequisite: None

Designation: Required

Course Objectives:

During this course, students will develop and/or refine their knowledge in the following areas:

- Introduce the students to a diversity of engineering careers.
- Understanding of the Engineering Design Process.
- Use of engineering tools for problem solving.
- Engage students with interesting problem scenarios.
- Presentation of data, estimations and interpolations, and programming skills.
- Development of design skills.

Teaching Methods: Lectures, Assignments, Quizzes, Exams.

Communication: Official communication (except lectures) about this course will be sent to your FSU email or through Canvas. You need to check them every day.

Learning Outcomes: Upon completion of this course, students will be able to:

- Discovering the role of engineers and the system of moral principles that apply to the practice of engineering.
- Discovering the design process and its phases.
- Outline the primary components of Project Management.
- Investigate tools and techniques to effectively deliver an engineering presentation.
- Acquire an engineering mindset and tackle real-world problems.
- Identify, formulate, and solve engineering problems.
- Introducing the Metric System and effectively converting Units.
- Discovering the Universal Units and relate them.
- Investigating efficient energy and water savings practices.
- Understanding the importance of sustainability in Engineering.

Policies and Procedures

Your health and safety are important. Therefore, during every physical in-person meeting of this course, everyone is required to follow state, local, and University public health mandates as outlined in the FSU Social Compact. Everyone must wear a face mask that covers their nose and mouth, and respect posted signage. The Code of Student Conduct notes that following these health and safety protocols constitute complying "with a reasonable request from authorized University personnel in the performance of their official duties," and failing to do so is a Code of Student Conduct violation. Students who do not comply with these mandates will be asked to leave class. Students who refuse to leave will be referred to the Dean of Students and may be administratively removed from the class if found to be responsible for Code of Conduct violations.

Participation Policy: This class will use some of the current techniques of active learning such as brainstorming, reciprocal questioning, tell-me-something-new, and case studies review. Participation to the classes are important as the more you participate the more you learn effectively.

Make-up Policy: There will be no-make up for any of class activities, homework, pop quizzes or exams unless there is a documented personal and/or close family emergency. Please make your arrangements if the need should arise for a make-up exam.

Assignment Policy: No late assignment will be accepted. Details are given in Assignment Section below.

Cellular Phone Policy: Studies show that cellphones and other mobile devices can significantly enrich learning, so long as they are mindfully added to the classroom. Cell phones are only allowed during active learning that requires using an app or student engagement platform. Classroom pop quizzes, discussions and other active learning ideas may be executed on a mobile device. However,

- phones are not allowed to text/message for personal and/or social reasons during class,
- phones are only allowed to be used at times and for purposes directed by the instructor,

- when texting/messaging for classroom purposes, students will only text/message information relevant to the class activity and will refrain from adding extraneous and/or inappropriate information, and
- when texting/messaging for classroom activities, students are permitted to use university-appropriate abbreviations.

Smart Watch Policy: Students are not allowed to text/message for personal and/or social reasons during class using their smart watches. Smart watches are not allowed during exams, as well. Please ensure that your smart watch is placed in your bag before the start of the examination.

Class Cancelation: Class will only be canceled if FSU is closed during class time. The only reliable sources for FSU closing are the FSU website, the FSU email system, and BURG Alerts.

Academic Dishonesty: According to the Student Code of Conduct: "Academic dishonesty is defined to include any form of cheating and/or plagiarism. Cheating includes, but is not limited to, such acts as stealing or altering testing instruments; falsifying the identity of persons for any academic purpose; offering, giving or receiving unauthorized assistance on an examination, quiz or other written or oral material in a course; or falsifying information on any type of academic record. Plagiarism is the presentation of written or oral material in a manner which conceals the true source of documentary material; or the presentation of materials which uses hypotheses, conclusions, evidence, data, or the like, in a way that the student appears to have done work which he/she did not, in fact, do. In cases involving academic dishonesty, a failing grade or a grade of zero (0) for either an assignment and/or a course may be administered. Students who are expelled or suspended for reasons of academic dishonesty are not admissible to other institutions within the University System of Maryland. Suspension or expulsion for academic dishonesty is noted on a student's academic transcript." Retrieve from: http://www.frostburg.edu/fsu/assets/File/Administration/policies/policystatements.pdf

Disruptive Behavior: University regulations require that the following statement be included in any course syllabus: "The University will not tolerate disorderly or disruptive conduct which substantially threatens, harms, or interferes with university personnel or orderly university processes and functions. A faculty member may require a student to leave the classroom when his/her behavior disrupts the learning environment of the class. A student found responsible for disruptive behavior in the classroom may be administratively withdrawn from the course."

Grade Grievance: If you feel that you have been improperly awarded a grade that you did not earn, you may initiate the grade grievance process. More information, including the specific timeline and procedures, is available in the back of the undergraduate catalog.

Confidentiality and Mandatory Reporting: Frostburg State University and its faculty are committed to maintaining a safe learning environment and supporting survivors of violence. To meet this commitment and comply with federal and state law, FSU requires all faculty and staff (other than the confidential employees in CAPS and Brady Health) to report any instances of gender-based harassment, sexual misconduct, relationship violence, or stalking against students. This means if you share your or another FSU student's experience with gender-based harassment, sexual misconduct, relationship violence, or, stalking, I have a duty to report the information to the University's Title IX Coordinator. The only exception to my reporting obligation is when such incidents are communicated

during class discussion, as part of an assignment for a class, or as part of a University-approved research project.

Faculty and staff are also obligated to report allegations of child abuse and neglect to University Police and to Child Protective Services. This obligation extends to disclosures of past abuse even if the victim is now an adult and the abuser is deceased. My duty to report suspected child abuse and neglect extends to disclosures that are made as part of classroom discussions and in writing assignments.

If you or someone you know has experienced an incident of harassment or violence, please go to www.frostburg.edu/titleix to find information on reporting options and the resources and services available for support.

Assignments

Homework and Lab Assignments: Homework are assigned as the material is covered. Each homework assignment has a due-date that will be announced on Canvas. Each assignment will be graded, and assignment grades play a substantial part of your total grade. You are encouraged to discuss homework questions with your classmates; however, you should write up solutions separately. No late homework will be accepted. Lab assignments will generally be due every week. Assignments will not be accepted past the due date without a valid excuse.

Quizzes: Closed-book/closed-notes quizzes will be given during some classes. The problem will either be identical or very similar to one of the in-class reviewed problems or homework problems that were assigned previously. No make-up quizzes will be given. Students who miss a quiz will receive a grade of zero for the missed quiz. Lowest two quizzes will be dropped.

Final Exam Policy: There will be a comprehensive final exam at the end of the semester held during finals week. Use of cell phones and laptop computers are NOT allowed. Students who miss an exam due to a University approved excused absence must contact the instructor prior to the missed assessment and provide documentary evidence to support their claim. Only one make-up exam will be given at a single date and time for all students who require it.

Design Project: Each student will work in teams to research, design, analyze, and present a solution to a given project. The design projects shall be worked on mostly outside of the regular lab period.

Important notes: There will be a review-exam class, as sort of question and answer (QA) session, before the final exam. This session includes solving course-related problems, as well as answering your questions.

Grading

The course grade will be determined in the following distributions.

Homework	15%
Quizzes	15%
Lab Assignments	30%
Final Project	20%
Final Exam	20%
Total	**100%**

Grading Scale

A	90 – 100%
B	80 – 89%
C	70 – 79%
D	60 – 69 %
F	0 - 59%

Tentative Class Schedule (Fall 2021)

Week	Lectures	Labs
1	What Engineers Do + Ethics	BOM MS Excel
2	What is Design: Design Cycle and Phases + Design Examples	SOP MS Word
3	Elements of Project Management	Spreadsheet Analysis
4	Engineering Communication	Water Rockets 1
5	Estimation & Fundamental Dimensions and Base Units	Water Rockets 2
6	Universal Units: Force and Motion	Water Rockets 3
7	Energy Conversion, Energy Efficiency, Water Savings	Intro to the Design project + Autodesk Inventor
8	Materials Engineering	Bridges 1
9	Mechanical Engineering	Bridges 2
10	Electrical Engineering	Buoyancy
11	Engineering Economics	Elasticity
12	The Life-Cycle Thinking and Sustainable Engineering	Wattage
13	Models and Systems	Life Cycle Costing
14	Statistics	Presentations
15	Final Exam	