ERE 133: INTRODUCTION TO ENGINEERING DESIGN
COURSE SYLLABUS—SPRING 2022

Instructor	Lindi Quackenbush Phone: 315-470-4727	E-mail: ljquack@esf.edu Office: 402 Baker
Teaching Assistants	Sarina Adeli (sadeli@syr.edu) and Justin Beslity (jobeslit@syr.edu)	
Support Staff	Karen Karker (kmkarker@esf.edu)	
Class Meetings	Monday/Wednesday 10:35–11:30 A.M. Tuesday 2:00–4:50 P.M.	Bray 321 309/434 Baker
Office Hours	check Blackboard Instructor information	

Required Textbooks Available from SU Bookstore (https://syracuse.ecampus.com/)

Engineering Design, 4th Edition, C.L. Dym, P. Little, and E.J. Orwin

Engineering Graphics Essentials with AutoCAD 2020 Instruction, K. Plantenberg

Writing with Style: Conversations on the Art of Writing, 3rd Edition, J.R. Trimble

Course Description

ERE 133 introduces the engineering profession, including design, communication, ethical and professional behavior, teamwork, and data analysis. This course reinforces learning through study, conduct, and critique of design exercises related to environmental resources engineering. Students will engage in individual and team-oriented activities such as lecture, discussion, observation, computation, reading, and writing.

Program and Course Learning Outcomes

At the completion of this course, each student will be able to:

2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
    - Use an engineering design approach to design a system or process that meets desired needs within specific constraints and performance criteria.
3. Communicate effectively with a range of audiences.
    - Communicate effectively using oral, written, and graphic processes consistent with the needs and tools of the profession, including word processing, oral presentations, and engineering graphics.
4. Recognize ethical and professional responsibilities in engineering situations, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
    - Describe the professional and ethical responsibilities of an engineer.
5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
    - Function as part of a team of peers to solve an engineering problem.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.
    - Explain the need for lifelong learning and describe sources for learning outside the classroom.

Course Overview

Students in ERE 133 will utilize a range of tools to design solutions to open-ended, engineering problems and present these designs to their peers and engineering professionals. The designs will require problem analysis and evaluation of practical alternatives in order to identify a solution. Students will follow a design process, which involves inquiry, deliberation, evaluation, innovation and attention to professional duty. Major concepts planned for the semester include:

1. Develop an understanding of engineering analysis and design processes.
2. Expand written, graphic and oral communication skills, including memoranda, reports, oral and poster presentations, and orthographic and isometric drawings.
3. Increase proficiency in the use of engineering tools, such as software designed for word processing (e.g., MS Word), presentations (MS PowerPoint), and graphics (AutoCAD).
4. Develop an appreciation of the functional roles, assessment, and feedback necessary for successful teamwork.
5. Investigate the engineering profession and explore issues in professional development, licensing and engineering ethics.

Class Participation and Attendance Policy

Students in ERE 133 will receive guidance in the systematic application of engineering design and project management skills to solve environmental resource-related problems. Student preparation for and participation in classes is essential to the success in this course. Attendance is required so that students can fully participate in classes, project development, report writing, and oral presentations as part of a team.

Evaluation

Evaluation is used to determine your success in meeting minimum standards of quality and performance. Your performance on a team and the quality of your proposed solutions contribute greatly towards your final grade. We will place emphasis on your ability to apply a design process that leads to a quality solution. Team evaluation will consider the systematic application of the design process, including documentation, time management, participation in team and class activities, and the quality of work that leads to a solution. The evaluation also includes work products such as reports, presentations and other documents.

Principal Work Products

Memoranda

Groups will submit professional memoranda for the two design projects. Grading of the memoranda will consider both content and style. The instructors will provide guidance to ensure that all groups meet a high professional standard.

Oral Presentations

Groups will make oral presentations before an audience of peers, faculty, and professional colleagues. Two oral presentations are required during the semester: one associated with each of the design projects. Evaluation criteria will consider the delivery, quality and content of the presentations.

Engineering Design Reports

Student will submit individual Engineering Design Reports for the two design projects. The instructors will evaluate the written reports for conformance with the guidelines and specifications provided in class. The reports should demonstrate the quality of the design

process followed and the robustness of the proposed solution. Documentation of the design process, calculations and graphics will form a significant portion of the evaluation.

Peer Evaluation and Course Participation

Student progress and participation will be evaluated regularly throughout the semester. Key measures include assessment of student performance during structured class activities and peer assessments. Students will provide an evaluation of the contribution of their teammates and themselves at the conclusion of each group project. Self-assessment is integral to successful completion of the course. The instructors' evaluation of these assessments will consider completeness, participation, and evidence of growth during the semester.

Additional Work Products

Graphics assignments

Engineering graphics is an important tool for communication, engineering analysis and design. Students will explore drawing primarily with the aid of computer-aided drafting (CAD) software and will submit output from these exercises for assessment. Assessment will consider neatness, layout, satisfaction of problem statement, and other criteria specified with each assignment.

Mini design project submissions

There will be several small design projects performed throughout the semester. These projects may require preparation ahead of time or engagement during lecture or lab periods. These activities may have additional, small submissions.

Grade distribution

The table to the right summarizes the components that will contribute to your grade in ERE 133.

Component	***Contribution***
Group project elements	
Memoranda (group)	10 %
Oral presentations (group)	20 %
Engineering design reports (individual)	30 %
Peer evaluation	10 %
Course participation	10 %
Additional work products	
Graphics assignments	10 %
Mini-design and other project submissions	10 %

Grade assignment

The numerical scores you earn on the components listed above will average to a final numerical score for the course. Letter grades will be assigned based on the scale shown to the right; the grade cutoffs may be adjusted slightly when actually assigning final grades.

Letter Grade	***Range of Numerical Grade***
A	90 and above
A-	87 to just less than 90
B+	84 to just less than 87
B	80 to just less than 84
B-	77 to just less than 80
C+	74 to just less than 77
C	70 to just less than 74
C-	67 to just less than 70
D	60 to just less than 67
F	less than 60

Academic Dishonesty

Academic dishonesty is a breach of trust between a student, one's fellow students, or the instructor(s). Examples of academic dishonesty includes plagiarism and cheating, and other forms of academic misconduct. By registering for courses at ESF you acknowledge your awareness of the ESF Code of Student Conduct. More information regarding Academic Integrity, including the process for resolving alleged violations, is available in the Student Handbook (https://www.esf.edu/students/handbook/).

Sources of Support and Class Absence

If you experience academic or personal difficulties that affect your studies or life, there are many sources of support on campus. The College provides a website that serves to answer many student questions: http://www.esf.edu/students/success. In addition, the ESF Office of Student Affairs, 110 Bray Hall (470-6660) will provide academic support, career guidance, personal counseling, or direct you to the proper source of help. If you encounter a situation beyond your control in which you will be missing two or more days of classes, you can contact the Office of Student Affairs and they will contact your instructors. Supportive documentation may be required.

Accommodations for Students with Learning and Physical Disabilities

SUNY-ESF works with the Center for Disability Resources (CDR) at Syracuse University, which is responsible for coordinating disability-related accommodations. To learn about and access disability-related resources, please follow instructions on their website: https://disabilityresources.syr.edu/students/. Students can also contact CDR at 315-443-4498. Since accommodations may require early planning and generally are not provided retroactively, please contact them as soon as possible. Students may also contact the ESF Office of Student Affairs, 110 Bray Hall, 315-470-6660 for assistance with the process.

Inclusive Excellence

As an institution, we embrace inclusive excellence and the strengths of a diverse and inclusive community. During classroom discussions, we may be challenged by different ideas. Understanding individual differences and broader social differences will deepen our understanding of each other and the world around us. In this course, all people are strongly encouraged to share their unique perspectives and experiences in a respectful manner. This statement is intended to help cultivate a respectful environment, and it should not be used in a way that limits expression or restricts academic freedom at ESF.

Religious Observance:

ESF recognizes the diversity of faiths represented among the campus community and protects the rights of students to observe holy days according to their religious tradition. Students will have an opportunity to make up work requirements missed due to a religious observance provided they give the instructor reasonable advance notification.

Course History

This course has evolved alongside the Environmental Resources Engineering program. Dr. James Hassett taught the initial offering of the course as FEG 296 in 2008 combining material from the one-credit FEG 300 (design) and ERE 225 (graphics) courses taught by Professor Doug Daley. This course was offered twice as FEG 133 in largely the same format it is in today. We thank the prior instructors for providing materials for use in this class.

ERE 133 LECTURE SCHEDULE FOR 2022

Week	Session	Topics	Readings		Major Submissions Group (G) or Individual (I)
			DLO	Trimble	
1	24 Jan	Introduction to engineering/communication	9		
	26 Jan	Brainstorming			
2	31 Jan	Introduction to engineering design	1		
	2 Feb	The design process; Communication	2	1	Geospatial memo (G)
3	7 Feb	Mini design—paper airplanes			Airplane design sheet (I)
	9 Feb	Defining the problem	3–6		
4	14 Feb	Writing—getting going	11.1,11.3	2	
	16 Feb	Communication—oral	11.2		
5	21 Feb	Team dynamics and project management	15 & 16		
	23 Feb	Mini design project—building bridges			
6	28 Feb	Design alternatives	7 & 8		Geospatial report (I): *28 Feb*
	2 Mar	Writing—openers		3	
7	7 Mar	Writing—middles and closers		4 & 5	
	9 Mar	Prototypes—Mini design project—catapult	10		
8	14 Mar	*Spring break – No classes*			
	16 Mar	*Spring break – No classes*			
9	21 Mar	Writing—diction and readability		6 & 7	Ecol. Eng. memo (G)
	23 Mar	Writing—superstitions and critical analysis		8 & 9	
10	28 Mar	Writing—revising and proofreading		10–12	
	30 Mar	Communication – why writing matters			
11	4 Apr	Mini design project—spaghetti towers			
	6 Apr	Writing—other thoughts		13–16	
12	11 Apr	Ecological Engineering project work time			Ecol. Eng. poster draft (G)
	13 Apr	Lifelong learning			Lifelong learning assessment (I)
13	18 Apr	Mini design project—egg drop design			
	20 Apr	Mini design project—egg drop testing			Ecol. Eng. report (I): *25 Apr*
14	25 Apr	Engineering ethics	17		Ethics assessment (I)
	27 Apr	Future design considerations	13 & 14		
15	2 May	Water Resources project work time			
	4 May	Water Resources project work time			

Note: Readings to be completed before the assigned lecture from:

DLO: C.L. Dym, P. Little, and E.J. Orwin, *Engineering Design*, 4th Edition

J.R. Trimble, *Writing with Style*, 3rd Edition

ERE 133 LAB SCHEDULE FOR 2022

Week	Session		Topics	Graphics Homework	Location
1	25 Jan	2:00–4:50	AutoCAD: Chapter 1/2		Baker 309/434
2	1 Feb	2:00–3:20	AutoCAD: Chapter 2	P2-1, P2-2	Baker 309/434
		3:20–4:50	Geospatial project work time		Baker 309/434
3	8 Feb	2:00–3:20	AutoCAD: Chapter 3	P3-13, P3-14, P3-17 (bonus P3-31, P3-33)	Baker 309/434
		3:20–4:50	Geospatial project work time		Baker 309/434
4	15 Feb	2:00–3:20	AutoCAD: Chapter 4	P4-1, P4-4	Baker 309/434
		3:20–4:50	Geospatial project work time		Baker 309/434
5	22 Feb	2:00–3:40	Geospatial project presentations		Baker 309/434
		3:40–4:50	AutoCAD (extra session)		Baker 309/434
6	1 Mar	2:00–3:20	AutoCAD: Chapter 5/6	P5-4, P5-5	Baker 309/434
		3:20–4:50	Ecological Eng. project work time		Baker 309/434
7	8 Mar	2:00–3:20	AutoCAD: Chapter 7/8	P8-3, P8-5	Baker 309/434
		3:20–4:50	Ecological Eng. project work time		Baker 309/434
8	15 Mar		*No lab – Spring break*		
9	22 Mar	2:00–3:20	AutoCAD/Dremel		Baker 309/434
		3:20–4:50	Ecological Eng. project work time		Baker 309/434
10	29 Mar	2:00–4:50	Ecological Eng. project work time		Baker 309/434
11	5 Apr	2:00–4:50	Ecological Eng. project work time		Baker 309/434
12	12 Apr	2:00–4:50	Ecological Eng. project work time		Baker 309/434
13	19 Apr	2:00–4:50	Ecological Eng. project presentations		Baker 309/434
14	26 Apr	2:00–4:50	Water Resources project work time		Baker 309/434
15	3 May	2:00–4:50	Water Resources project work time		Baker 309/434

Notes: Graphics homework is from the Plantenberg AutoCAD text.

- Homework is due before the start of the next lab period.
- Additional in-class exercises will be assigned each week.