ERE 133: INTRODUCTION TO ENGINEERING DESIGN
COURSE SYLLABUS—SPRING 2017

Instructor	Lindi Quackenbush	E-mail: ljquack@esf.edu
	Phone: 315-470-4727	Office: 416 Baker (mailbox in 402 Baker)
Teaching Assistants	Siqi Li	sli151@syr.edu
	Maggie Todaro	mtodaro@syr.edu

Class Meetings	Monday/Wednesday 10:35–11:30 A.M.	321 Bray
	Tuesday 2:00–4:50 P.M.	432/309 Baker

Office Hours To be announced

Required Textbooks Available from ESF College Bookstore

Engineering Design, 4th Edition, C.L. Dym, P. Little, and E.J. Orwin
Engineering Graphics Essentials with AutoCAD 2016 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.

Course and Program Learning Outcomes

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

1. Use an engineering design approach to design a product, process or system that meets desired needs within given constraints and performance criteria.
2. Communicate effectively using oral, written and graphic processes consistent with the needs and tools of the profession, including word processing, spreadsheet analysis, oral presentations, and engineering graphics.
3. Function as part of a team of peers to solve an engineering problem.
4. Describe the professional and ethical responsibilities of an engineer.
5. Explain the need for lifelong learning and describe sources for learning outside the classroom.

College Learning Outcomes

Within the context of the course description and course outcomes presented above, this course will contribute to students achieving the following College-wide learning outcomes:

- Quantitative Reasoning
  - Interpret and apply quantitative information to perform engineering design within given constraints.
- Communication
  - Formulate and present ideas effectively using oral, written and graphic processes.

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 alternative solutions in order to identify an alternative. 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, plans and specifications, 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), spreadsheet analysis (MS Excel), 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 its role in contemporary society.
6. Explore issues in professional development, licensing and engineering ethics.

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 participation in classes and as part of a team 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.

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.

Grade distribution

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

Component	***Contribution***
Oral presentations (three projects)	30 %
Engineering design reports (three projects)	45 %
Peer evaluation and course participation	15 %
Additional Work Products Memoranda Graphics assignments Mini-design 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 by a point 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

Principal Work Products

Oral Presentations

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

Engineering Design Reports

Each student will submit an Engineering Design Report for each of the three design projects completed. 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 Participation

Each person will provide an evaluation of the contributions of their teammates and themselves at the conclusion of each group project. Evaluation guidelines will be provided in class.

Student progress and participation will be evaluated regularly throughout the semester. Key tools for assessment include assessment of student performance during structured class activities and peer assessments. Assessments will be real-time (occurring during the execution of an activity), formative, or summative (occurring at the conclusion of an activity). Self-assessment (individual student responsibility for self-assessing performance) will be 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

Memoranda

Throughout the course of the semester, groups will be required to submit professional memoranda. 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.

Graphics assignments

Engineering graphics is an important tool for communication, engineering analysis and design. Students will explore freehand sketching and drawing with the aid of traditional instruments and computer-aided drafting (CAD) software and will submit output from these exercises for assessment. Work will be assessed on neatness, layout, line clarity, angle definition, 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 and will certainly require interaction in class. These activities may have additional, small submissions.

Academic Dishonesty

Academic dishonesty is a breach of trust between a student, one's fellow students, or the instructor(s). By registering for courses at ESF you acknowledge your awareness of the ESF Code of Student Conduct (http://www.esf.edu/students/handbook/StudentHB.05.pdf), in particular academic dishonesty includes but is not limited to plagiarism and cheating, and

other forms of academic misconduct. The Academic Integrity Handbook contains further information and guidance (http://www.esf.edu/students/integrity/). Infractions of the academic integrity code may lead to academic penalties as per the ESF Grading Policy (http://www.esf.edu/provost/policies/documents/GradingPolicy.11.12.2013.pdf).

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 Office of Disability Services (ODS) at Syracuse University, who is responsible for coordinating disability-related accommodations. Students can contact ODS at 804 University Avenue- Room 309, 443-4498 to schedule an appointment and discuss their needs and the process for requesting accommodations. Students may also contact the ESF Office of Student Affairs, 110 Bray Hall (470-6660) for assistance with the process. To learn more about ODS, visit http://disabilityservices.syr.edu. Authorized accommodation forms must be in the instructor's possession one week prior to any anticipated accommodation. Since accommodations may require early planning, and generally are not provided retroactively, please contact ODS as soon as possible.

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 respectfully share their unique perspectives and experiences. 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 religious holy days according to their 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 when it first combined 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 2017

Week	Session	Topics	Discussion Chapters		Submissions	Location
			DLO	Trimble		
1	18 Jan	Introduction to engineering and communication	9			Bray 321
2	23 Jan	Brainstorming				Bray 321
	25 Jan	Introduction to engineering design	1			Bray 321
3	30 Jan	The design process; Communication	2	1	Geospatial project memo due	Bray 321
	1 Feb	Mini design—paper airplanes			Airplane design sheet due	Bray 321
4	6 Feb	Defining the problem	3–6			Bray 321
	8 Feb	Writing—getting going	11.1,11.3	2		Bray 321
5	13 Feb	Communication—oral	11.2			Bray 321
	15 Feb	Mini design project—Lego bridges				Baker 309
6	20 Feb	Design alternatives	7 & 8		Geospatial project report due	Bray 321
	22 Feb	Team dynamics and project management	15 & 16			Bray 321
7	27 Feb	Prototypes—Mini design project—hoists	10			Baker 309
	1 Mar	Writing—openers		3		Bray 321
8	6 Mar	Writing—middles and closers		4 & 5	Ecological Eng. project memo due	Bray 321
	8 Mar	Writing—diction and readability		6 & 7		Bray 321
9	13/15 Mar	*No Class—Spring Break*				
10	20 Mar	Mini design project—spaghetti towers				Bray 321
	22 Mar	Writing—superstitions and critical analysis		8 & 9	Ecological Eng. poster outline due	Bray 321
11	27 Mar	Ecological Engineering project work time				Baker 309
	29 Mar	Mini design project—catapult				Bray 321
12	3 Apr	Writing—revising and proofreading		10–12	Ecological Eng. project report due	Bray 321
	5 Apr	Water Resources project work time				Baker 309
13	10 Apr	Writing—other thoughts		13–16	Water Res. project memo due	Bray 321
	12 Apr	Mini design project—egg drop design				Baker 309
14	17 Apr	Mini design project—egg drop testing			Egg drop design sheet due	Bray 321
	19 Apr	Lifelong learning				Bray 321
15	24 Apr	Water Resources project work time				Baker 309
	26 Apr	Future design considerations	13 & 14			Bray 321
16	1 May	Engineering ethics	17		Water Res. project report due: 5 *May*	Bray 321

*Reading source

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 2017

Week	Session		Topics	Assigned Graphics Exercises*	Location
1	17 Jan	2:00–4:50	AutoCAD Chapter 1		Baker 309
2	24 Jan	2:00–3:30	AutoCAD Chapter 1	P1: 1, 2, 3 (due 31 Jan)	Baker 309
		3:30–4:50	Geospatial project work time		Baker 309/432
3	31 Jan	2:00–3:30	AutoCAD Chapter 2	P2: 1, 2, 5, 19, 21, 22, 23 (due 7 Feb)	Baker 309
		3:30–4:50	Geospatial project work time		Baker 309/432
4	7 Feb	2:00–3:30	AutoCAD Chapter 3		Baker 309
		3:30–4:50	Geospatial project work time		Baker 309/432
5	14 Feb	2:00–3:00	AutoCAD Chapter 3	P3: 1, 2, 3, 4 (due 21 Feb)	Baker 309
		3:00–4:50	Geospatial project presentations		Baker 432
6	21 Feb	2:00–3:30	AutoCAD Chapter 4	P4: 2, 3 (due 3 Mar)	Baker 309
		3:30–4:50	Ecological Engineering project work time		Baker 309/432
7	28 Feb	2:00–3:30	AutoCAD Chapter 5		Baker 309
		3:30–4:50	Ecological Engineering project work time		Baker 309/432
8	7 Mar	2:00–3:30	AutoCAD Chapter 5	P5: 4, 5 (due 10 Mar)	Baker 309
		3:30–4:50	Ecological Engineering project work time		Baker 309/432
9	14 Mar		*No Class—Spring Break*		
10	21 Mar	2:00–4:50	Ecological Engineering project work time		Baker 309/432
11	28 Mar	2:00–4:50	Ecological Engineering project presentations		Baker 432
12	4 Apr	2:00–4:50	Water Resources project work time		Baker 309/432
13	11 Apr	2:00–4:50	Water Resources project work time		Baker 309/432
14	18 Apr	2:00–4:50	Water Resources project work time		Baker 309/432
15	25 Apr	2:00–4:50	Water Resources project presentations		Baker 432
16	2 May	2:00–4:50	Water Resources project work time		Baker 309/432

* Assigned graphics exercises are from the end of chapter materials. Additional in-class exercises will be assigned during the lab.