

ERE485/CEE400:
FUNDAMENTALS OF ENGINEERING PREPARATION
Spring 2022

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Class Meeting Time and Location: Wednesdays 11:40am – 12:35pm
Hybrid course both in person (Baker 437/434) and Zoom

Course Description: Discussion of content, administration and implementation of the Fundamentals of Engineering (FE) Exam, a comprehensive review of FE-type problems, and a targeted review of specific topics on the FE Exam. Spring.

Prerequisite: Senior standing or consent of instructor.

Required Text: FE Supplied-Reference Handbook

While this can be purchased, in the exam you will have to use an electronic copy. To obtain an electronic copy (which you should do):

- 1) Go to the NCEES site at: <https://account.ncees.org/register>
- 2) Follow the instructions to register your account and log into the system.
- 3) To the right, under “Useful Documents” click on “View reference handbooks” and then “FE Reference Handbook 10.1” (which is effective starting July 1, 2021)
- 4) Save the reference book

YOU MUST HAVE ACCESS TO THIS HANDBOOK FOR EVERY CLASS, INCLUDING THE FIRST CLASS OF THE SEMESTER.

Additional Resources:

A number of study manuals can be purchased online
Practice problems can also be purchased online

Course Objectives:

- 1) Review past engineering course material
- 2) Identify strengths and weaknesses of individual students on this material
- 3) Prepare for the Fundamentals of Engineering (FE) exam.

Class Learning Outcomes:

By the end of this course, students will have reinforced their ability:

- 1) To identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics (ABET outcome 1)

ESF Learning Outcomes:

This course will contribute to students achieving SUNY ESF College-wide learning outcomes:

- 1) Quantitative Reasoning: Students will be able to effectively describe, interpret, apply, and evaluate quantitative information.

Grading:

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| 1) Quizzes (weekly quiz to be taken during the class period; 1 quiz may be missed without penalty) | 25% |
| 2) Homework Assignments (1 homework may be missed without penalty) | 25% |
| 3) Attendance to review sessions (1 of these classes can be missed without penalty) | 25% |
| 4) Review session evaluations and final class evaluations (1 evaluation may be missed without penalty) | 25% |

Problem Sets:

- 1) You will be provided with weekly problem assignments in Blackboard.
- 2) You will enter your answers in Blackboard prior to the following class (by 11:40 am the following Wednesday).
- 3) You will submit evidence of your work on homework problems (by 11:40 am the following Wednesday). Your work on these problems (“scratch work”) is to be scanned and submitted on Blackboard under “Assignments”. You could alternatively or additionally submit an Excel file or R script if either is used to solve homework questions.
- 4) You will be graded on your attempt to find the solution, and not on getting the correct answer.

Academic Integrity:

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>).

Syracuse University’s Academic Integrity Policy reflects the high value placed on honesty in academic work. The policy defines our expectations for academic honesty and holds students accountable for the integrity of all work they submit. Students should understand that it is their responsibility to learn about course-specific expectations, as well as about university-wide academic integrity expectations. The policy governs appropriate citation and use of sources, the integrity of work submitted in exams and assignments, and the veracity of signatures on attendance sheets and other verification of participation in class activities. The policy also prohibits students from submitting the same work in more than one class without receiving written authorization in advance from both instructors. Under the policy, students found in violation are subject to grade sanctions determined by the course instructor and non-grade sanctions determined by the

School or College where the course is offered as described in the Violation and Sanction Classification Rubric. SU students are required to read an online summary of the University's academic integrity expectations and provide an electronic signature agreeing to abide by them twice a year during pre-term check-in on MySlice.

Sources of Support and Class Absence:

If you experience academic or personal difficulties that affect your studies or life, there are people and resources that will help you. For ESF students there is a website that serves to answer many student questions: <http://www.esf.edu/students/success>. In addition, the ESF Office of Student Life, 110 Bray Hall (470-6660) will provide academic support, career guidance, personal counseling, or direct you to the proper source. If you encounter a situation beyond your control in which you will be missing 3 or more days of classes, you should contact the Office of Student Life and they will get in touch with all your instructors for you. Supportive documentation may be required.

For SU students, please contact your ECS Success Advisor and Dr. Driscoll.

Accommodations for Students with Learning and Physical Disabilities:

The Office of Disability Services (ODS) at Syracuse University, who is responsible for coordinating disability-related accommodations for both ESF and SU students. Students can contact ODS at 804 University Avenue- Room 309, 315-443-4498 or email disabilityservices@syr.edu 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, 315-470-6660 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 Statement:

As academic institutions, 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.

Religious Observance:

ESF and SU insures the rights of students to observe religious holy days according to their tradition. Students will be provided an opportunity to make up any exam or work requirements that may be missed due to a religious observance provided they give the instructor reasonable advance notification.

National Council of Examiners for Engineering and Surveying (NCEES):

- 1) Non-profit organization composed of engineering and surveying licensing boards representing all states and U.S. territories
- 2) Develops scores and administers the examinations used for engineering and surveying licensure
- 3) Facilitates professional mobility for licensed engineers and surveyors
- 4) Administers the Fundamental of Engineering (FE) Exam

Effective Beginning with the January 2014 Examinations

- 1) The FE examination is a ~6-hour:
 - a. Nondisclosure agreement (2 minutes)
 - b. Tutorial (8 minutes)
 - c. Exam (5 hours 20 minutes)
 - d. Scheduled break (25 minutes)
- 2) Exam is 110 questions
- 3) Offered in 7 subject areas-Chemical, **Civil**, Electrical, **Environmental**, Industrial, Mechanical, and **Other Disciplines**.
- 4) Starting July 1st, 2017 the FE will contain Alternative Item Type (AIT) questions. These include Multiple Correct, Point and Click, Drag and Drop, or Fill in the Blank type questions (for more information on the AIT's, please visit <https://ncees.org/exams/cbt/>)

The following materials are NOT permitted in exam room:

- 1) Devices or materials that might compromise the security of the examination or examination process are not permitted (don't have a phone with you!).
- 2) Only models of calculators as specified by NCEES are permitted in the examination room. See <http://ncees.org/exams/calculator-policy/>
- 3) FE examinees will be furnished a copy of the [FE Supplied-Reference Handbook](#) at the exam site. This is the only reference material you will use during the exam.

When will I know my exam result? Typically within 7-10 days after the exam date. The exam results are pass or fail. If you fail, you'll receive a diagnostic report showing performance in major topics.

After I pass a Fundamentals exam, what's next?

Passing a Fundamentals exam is first step toward licensure.

To continue the licensure process, complete the following:

- 1) Obtain at least 4 years of experience deemed acceptable to your licensing board
- 2) Take one of the Principles and Practice (PE) exams

Recent FE Exam Pass Rates:

January – June or July – December 2021 FE examinees who:

- Took the FE exam for the first time
- Attended EAC/ABET-accredited engineering programs
- Took the FE exam within 12 months of graduation

Exam	Volume	Pass Rate
Chemical	701	74%
Civil	6049	70%
Electrical and Computer	1189	72%
Environmental	780	79%
Industrial	254	67%
Mechanical	3632	75%
Other Disciplines	910	63%

ERE Environmental =>	Spring 2021:	96%!
	Spring 2020:	83%
	Spring 2019:	93%
	Spring 2018:	77%
	Spring 2017:	71%
	Spring 2016:	90%
	Spring 2015:	80%

What's on the exam? Updated on July 2020, see <https://nces.org/wp-content/uploads/FE-Environmental-CBT-specs.pdf>

ERE485/CEE400 Tentative Class Schedule

Date	Tentative Schedule of Topic Areas
26-Jan	Introduction to Class, Math, Prob & Stats, Ethics
2-Feb	Eng Economics, Materials, Thermo, Chemistry
9-Feb	Water and Wastewater Treatment, Env. Science
16-Feb	Water Resources, Groundwater, Soils
23-Feb	Air Quality, Fluids
2-Mar	Solid and Hazardous Waste, Risk Assessment
9-Mar	Specific Topic Review
23-Mar	Specific Topic Review
30-Mar	Specific Topic Review
6-Apr	Specific Topic Review
13-Apr	Specific Topic Review
20-Apr	Specific Topic Review
27-Apr	Specific Topic Review
5-May	Course Evaluations/FE Exam Feedback