

Engin 100 Introduction to Engineering

Course Syllabus

- Lecture:** Monday/Wednesday/Friday 12:20pm – 1:10pm
Integrative Learning Center (ILC) S140
- Lab:** Thursday 8:30am – 11:15am
Engineering Laboratory (ELab) 307 or Integrative Learning Center (ILC) S311
(Check Schedule)
- Final Exam:** Friday, December 14, 1:00pm – 3:00pm
ILC S140
- Instructors:** Eric Gonzales, Civil and Environmental Engineering, (gonzales@umass.edu)
Office: Marston 142B, Office Hours: Tu 10:00–12:30, Th 2:00–4:30
Matthew Lackner, Mechanical Engineering (lackner@ecs.umass.edu)
Office: ELab 324
Bernd Schliemann, Industrial Engineering (bfschlie@umass.edu)
Office: Marston 126, Office Hours: Daily 9:00–11:00, MWF 1:30–2:15,
4:00–5:00, TuTh 2:30–5:00, or by appointment
Jay Taneja, Electrical and Computer Engineering (jtaneja@umass.edu)
Office: Knowles 309C
Dandan Xu, Chemical Engineering (dandan@umass.edu)
Office: Goessman 158F, Office Hours: F 2:00–4:00
You are encouraged to schedule individual meetings through Doodle MeetMe
at <https://doodle.com/dandanxu>.
- Rana Eslamifard, Graduate Teaching Assistant (reslamifard@umass.edu)
Office: Marston 139, Office Hours: W 10:00–12:00

Course Overview

This course is intended to provide you with an overview of the fields of electrical and computer engineering, mechanical and industrial engineering, civil and environmental engineering, and chemical engineering so you can confidently decide which engineering discipline to pursue as a profession. Throughout the semester, you will develop basic skills in problem solving, computation, design, and communication that will help you in all future engineering courses.

In the course, you will learn about electrical energy, signals, computing, engineering economics, energy conservation, energy conversion, basic mass balances applied to non-reaction chemical processes, process design, structural design, sustainability, and impacts of transportation decisions. You will discover how engineering solves societal problems.

Through a combination of lectures, demonstrations, computation and simulation (using MATLAB and Excel), and labs, you will learn about the fundamentals of various engineering disciplines. The material learned in this course will serve you as a basis in the engineering major you will pursue.

Course Goals

At the end of this course, you will be able to

1. Describe how engineering provides technological solution to address a wide range of societal challenges;

2. Explain the functionality and operation of specific systems in various engineering domains and their basic mathematical and scientific foundations;
3. Apply engineering tools and techniques to solve engineering problems;
4. Perform computational lab experiments; and
5. Identify and critique design choices in system deployed in practice.

Course Structure and Content

Lectures and Labs

This course is structured around content modules that are studied in lecture settings and programming experiences that are gained in a lab setting. Each content module consists of 6 to 8 lectures and 2 homework assignments and is focused on one engineering discipline. Lab sessions are associated with each module.

Content Modules and Learning Outcomes

- Module 1: Electrical and Computer Engineering (ECE) – Power, signals, information
- Module 2: Industrial Engineering (IE) – Engineering economics, optimization, human factors, plant layout, quality control to engineering economics
- Module 3: Civil and Environmental Engineering (CEE) – Structural design, water resources and quality, transportation
- Module 4: Chemical Engineering (ChE) – Basic process design and analysis, Mass balance, Process economics
- Module 5: Mechanical Engineering (ME) – Energy conservation, energy conversion

Course Requirements and Grades

Your final grade will be derived from your performance in three areas:

1. **Attendance/Participation** [10%] You are expected to attend and actively participate in lectures. Attendance will be tracked with periodic sign-in sheets or in-class quizzes.
2. **Homework** [30%] Homework assignments consist of sets of theoretical problems and short coding assignments. Homework are assigned according to the schedule posted on the course website. Late submissions will not be accepted unless they fall under the UMass class absence policy.*
3. **Labs** [10%, passing grade required] The lab grade is based on the completion of lab assignments. Note that a passing grade in the lab assignment is required to receive a passing grade in the course.
4. **Exams** [50%] There is one midterm exam during the semester and one final exam. The exams are closed-book, closed-notes and evaluate how well you retained and understood the course content as well as how well you can apply the course concepts to new problems. For each exam, an in-class review session will be held to provide time for resolving issues regarding the content and procedure of the exam.

*<https://www.umass.edu/registrar/students/policies-and-practices/class-absence-policy>

You are encouraged to track your scores on Moodle to ensure that you have received the appropriate credit for each of your assignments and exams. No extra credit or “make-up” assignments will be given (with exception to the cases stated in the class absence policy).

Course Policies

Attendance and Punctuality

You are expected to attend the all of the lectures and lab sessions for which you are enrolled. You are expected to come to lectures, labs, and examinations on time; arriving late and/or leaving early is disrespectful and disrupts the entire class.

Late/Make-Up Policy

Assignments are due as posted. Late submissions will not be accepted unless they fall under the UMass class absence policy. Proof may be requested (e.g., note from a medical professional).

Academic Integrity Policy

Consultation with fellow students is encouraged. However, directly copying another student’s work (past or present) defeats the purpose of the assignments and is a violation of the code of conduct. Unless otherwise noted, students are expected to complete all assignment individually. Violations will result in serious penalties including course failure and possible disciplinary action. If in doubt, please consult the instructor or the official UMass guidelines regarding academic honesty.[†]

Inclusivity

We are all members of an academic community with a shared responsibility to cultivate a climate where all individuals are valued and where both they and their ideas are treated with respect. The diversity of the participants in this course is a valuable source of ideas, problem solving strategies, and engineering creativity. If you feel that your contribution is not being valued for any reason, please speak with the faculty privately. If you wish to communicate anonymously, you may do so in writing or speak with Dr. Paula Rees, Director of Engineering Diversity Programs (rees@umass.edu, 413.545.6324, Community, Equity, and Inclusion (CEI) Hub in Marcus Hall).

Course Schedule

Week	Date	Room	Topic	Assignment Due
1	9/4	ILC S140	Introduction	
	9/5		No Lab (Welcome Tent on Engineering Quad)	
	9/6	ILC S140	ECE Lecture 1	
2	9/9	ILC S140	ECE Lecture 2	
	9/11	ILC S140	ECE Lecture 3	
	9/12	ELab 307	ECE Lab 1	
	9/13	ILC S140	ECE Lecture 4	
3	9/16	ILC S140	ECE Lecture 5	
	9/18	ILC S140	ECE Lecture 6	
	9/19	ELab 307	ECE Lab 2	
	9/20	ILC S140	ECE Lecture 7	
(continues on the next page)				

[†]<http://www.umass.edu/honesty>

Week	Date	Room	Topic	Assignment Due
4	9/23	ILC S140	ECE Lecture 8	
	9/25	ILC S140	IE Lecture 1	
	9/26		No Lab	
	9/27	ILC S140	IE Lecture 2	
5	9/30	ILC S140	IE Lecture 3	
	10/2	ILC S140	IE Lecture 4	
	10/3	TBD	IE Lab 1	
	10/4	ILC S140	IE Lecture 5	
6	10/7	ILC S140	IE Lecture 6	
	10/9	ILC S140	IE Lecture 7	
	10/10	TBD	IE Lab 2	
	10/11	ILC S140	CEE Lecture 1	
7	10/14		No Class (Columbus Day)	
	10/15	ILC S140	CEE Lecture 2	
	10/16	ILC S140	CEE Lecture 3	
	10/17	TBD	CEE Lab 1	
	10/18	ILC S140	CEE Lecture 4	
8	10/21	ILC S140	CEE Lecture 5	CEE Homework 1
	10/23	ILC S140	CEE Lecture 6	
	10/24	TBD	CEE Lab 2	
	10/25	ILC S140	CEE Lecture 7	
9	10/28	ILC S140	CEE Lecture 8	
	10/30	ILC S140	Midterm Review	CEE Homework 2
	10/31	TBD	MIDTERM EXAM	
	11/1	ILC S140	ChE Lecture 1	
10	11/4	ILC S140	ChE Lecture 2	
	11/6	ILC S140	ChE Lecture 3	
	11/7	ELab 307	ChE Lab 1: Lab Tour	
	11/8	ILC S140	ChE Lecture 4	
11	11/11		No Class (Veterans' Day)	
	11/13	ILC S140	ChE Lecture 5	
	11/14	ELab 307	ChE Lab 2	
	11/15	ILC S140	ChE Lecture 6	
12	11/18	ILC S140	ChE Lecture 7	
	11/20	ILC S140	ME Lecture 1	
	11/21	ELab 307	ME Lab 1	
	11/22	ILC S140	ME Lecture 2	
THANKSGIVING BREAK				
13	12/2	ILC S140	ME Lecture 3	
	12/4	ILC S140	ME Lecture 4	
	12/5	ELab 307	ME Lab 2	
	12/6	ILC S140	ME Lecture 6	
14	12/9	ILC S140	ME Lecture 7	
	12/11	ILC S140	Final Review	
	12/19	ILC S140	FINAL EXAM	