

# Engin 100 Introduction to Engineering

## Course Syllabus

- Lecture:** Monday/Wednesday/Friday 12:20pm – 1:10pm  
Integrative Learning Center (ILC) S120
- Lab:** Thursday 8:30am – 11:15am  
Engineering Lab I (ELab) 307
- Final Exam:** Monday, December 19, 1:00pm – 3:00pm  
Integrative Learning Center (ILC) S120
- Instructors:** Eric Gonzales, Civil and Environmental Engineering, ([gonzales@umass.edu](mailto:gonzales@umass.edu))  
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Bernd Schliemann, Industrial Engineering ([bfschlie@umass.edu](mailto:bfschlie@umass.edu))  
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Jay Taneja, Electrical and Computer Engineering ([jtaneja@umass.edu](mailto:jtaneja@umass.edu))  
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### 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: Civil and Environmental Engineering (CEE) – Structural design, water resources and quality, transportation
- Module 2: Industrial Engineering (IE) – Engineering economics, optimization, human factors, plant layout, quality control to engineering economics
- Module 3: Mechanical Engineering (ME) – Energy conservation, energy conversion
- Module 4: Electrical and Computer Engineering (ECE) – Power, signals, information
- Module 5: Chemical Engineering (ChE) – Basic process design and analysis, Mass balance, Process economics

## 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 lectures or view online materials whenever possible.
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 exam during the semester and one during the final exam period. The first exam will cover the first three course modules. The second exam will cover the last two course modules.

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).

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

## Course Schedule

Week	Date	Room	Topic
1	9/7	ILC S120	Introduction
	9/8		<i>NO LAB</i>
	9/9	ILC S120	CEE Lecture 1
2	9/12	ILC S120	CEE Lecture 2
	9/14	ILC S120	CEE Lecture 3
	9/15	ELab 307	CEE Lab 1
	9/16	ILC S120	CEE Lecture 4
3	9/19	ILC S120	CEE Lecture 5
	9/21	ILC S120	CEE Lecture 6
	9/22	ELab 307	CEE Lab 2
	9/23	ILC S120	CEE Lecture 7
4	9/26	ILC S120	CEE Lecture 8
	9/28	ILC S120	IE Lecture 1
	9/29		<i>NO LAB</i>
	9/30	ILC S120	IE Lecture 2
5	10/3	ILC S120	IE Lecture 3
	10/5	ILC S120	IE Lecture 4
	10/6	ELab 307	IE Lab 1
	10/7	ILC S120	IE Lecture 5
6	10/10		<i>NO CLASS: Columbus Day/Indigenous Peoples Day</i>
	10/12	ILC S120	IE Lecture 6
	10/13	ELab 307	IE Lab 2
	10/14	ILC S120	IE Lecture 7
7	10/17	ILC S120	ME Lecture 1
	10/19	ILC S120	ME Lecture 2
	10/20	ELab 307	ME Lab 1
	10/21	ILC S120	ME Lecture 3
8	10/24	ILC S120	ME Lecture 4
	10/26	ILC S120	ME Lecture 5
	10/27	ELab 307	ME Lab 2
	10/28	ILC S120	ME Lecture 6
9	10/31	ILC S120	Exam 1 Review
	11/2	ILC S120	ECE Lecture 1
	11/3	ELab 307	EXAM 1
	11/4	ILC S120	ECE Lecture 2
10	11/7	ILC S120	ECE Lecture 3
	11/9	ILC S120	ECE Lecture 4
	11/10	ELab 307	ECE Lab 1
	11/11		<i>NO CLASS: Veterans Day</i>
11	11/14	ILC S120	ECE Lecture 5
	11/16	ILC S120	ECE Lecture 6
	11/17	ELab 307	ECE Lab 2
	11/18	ILC S120	ECE Lecture 7
12	11/21	ILC S120	ECE Lecture 8

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Week	Date	Room	Topic
	11/22	ILC S120	ChemE Lecture 1 (Friday Schedule) <i>THANKSGIVING BREAK</i>
13	11/28	ILC S120	ChemE Lecture 2
	11/30	ILC S120	ChemE Lecture 3
	12/1	ELab 307	ChemE Lab 2
	12/2	ILC S120	ChemE Lecture 4
14	12/5	ILC S120	ChemE Lecture 5
	12/7	ILC S120	ChemE Lecture 6
	12/8	ELab 307	ChemE Lab 2
	12/9	ILC S120	ChemE Lecture 7
15	12/12	ILC S120	Exam 2 Review
	12/19	ILC S120	EXAM 2

## Course Policies

### *Communication*

Communications regarding the class, schedules, assignments, etc. will be sent through the Moodle emailing list. Please check your UMass email regularly for course communications.

Engin 100 is a little bit unusual in the sense that there are five different instructors over the course of the semester. Prof. Gonzales ([gonzales@umass.edu](mailto:gonzales@umass.edu)) is the coordinating instructor for the semester. If you have general questions about course logistics, registration, schedule or course grades, you can contact Prof. Gonzales directly. For questions about the course content (e.g., lecture concepts, assignments, etc.) you should contact the TA or module instructor.

### *Attendance and Punctuality*

You are expected to attend 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).

## College Policies

### *Health and Wellbeing*

You are not alone at UMass -- many people care about your wellbeing and many resources are available to help you thrive and succeed. The College recognizes that coursework is challenging and that classes are not the only demand in your life. Success in this course and the College of Engineering depends heavily on your personal health and wellbeing. Recognize that while stress is an expected part of the college experience, it can be compounded by unexpected setbacks or life changes outside the classroom. Strive to reframe challenges as an unavoidable pathway to success. Reflect on your role in taking care of yourself throughout the term, before the demands of exams and projects reach their peak. Please feel free to reach out to me about any difficulty you may be having

that may impact your performance as soon as it occurs and before it becomes too overwhelming.

You can learn about the confidential mental health services available on campus by calling the Center for Counseling and Psychological Health (CCPH) by visiting their website at <https://www.umass.edu/counseling>. There are many other resources on campus for students facing personal, financial or life challenges to find support, stay in school, and graduate (<https://www.umass.edu/studentlife/single-stop>). Within the College, you may reach out to us, your academic advisor, the Office of Student Affairs (<http://engineering.umass.edu/current-students/academics-advising>) or the Office of Community Equity and Inclusion ([rees@umass.edu](mailto:rees@umass.edu)). We encourage you to contact support services on campus that stand ready to assist you. Remember that we are here to help you find the resources you need.

#### *Accessibility Support Statement*

Your success in this class is important to us. We all learn differently and bring different strengths and needs to the class. The University of Massachusetts Amherst is committed to making reasonable, effective and appropriate accommodations to meet the needs of all students and help create a barrier-free campus. If you have a qualifying disability and require accommodations while participating in this course, please work with Disability Services to have an accommodation letter sent to us in a timely manner. If you have a disability but are not yet affiliated with Disability Services, please register with Disability Services (<https://www.umass.edu/disability/students>). Information on services and materials for registering are also available on their website [www.umass.edu/disability](http://www.umass.edu/disability).

If you are eligible for exam accommodations, your exams will be administered by the exam proctoring center. Contact Disability Services immediately, and comply with their exam scheduling policies, including the requirement that you book your exams at least seven days in advance of the exam date. *It is incumbent upon you contact Prof. Gonzales during the first few weeks of the semester, or shortly following registration with Disability Services, to ensure that your accommodations are being sufficiently met, including extra time and note-taking access, as applicable.*

Finally, beyond disability accommodations, if there are aspects of the course that prevent you from being fully included in the class, please let me know as soon as possible. Together we'll develop strategies to meet both your needs and the requirements of the course.

#### *Academic Honesty Statement*

There is no place for a dishonest engineer! Maintaining the integrity of scholarship and research within institutions of higher education requires a cultural commitment. All members of the UMass Amherst community are expected to be knowledgeable of and uphold our academic honesty policies (<https://www.umass.edu/honesty/>). Academic dishonesty includes but is not limited to cheating, fabrication, plagiarism, and abetting or facilitating dishonesty. Instructors are requested to take reasonable steps to address academic misconduct, and appropriate sanctions may be imposed on any student who has committed an act of academic dishonesty. Any person who has reason to believe that a fellow student has committed academic dishonesty should bring such information to the attention of the appropriate course instructor or an alternate, trusted member of the faculty or College administration as soon as possible. Instances of academic dishonesty not related to a specific course should be brought to the attention of the appropriate department Head or Chair. Community members may fill out the College's classroom experience form (<https://tinyurl.com/UMassEngineerClassroom>) to report academic dishonesty anonymously. Since students are expected to be familiar with this policy and the commonly accepted standards of academic integrity, ignorance of such standards is not normally sufficient evidence of lack of intent.

*Cheating and Plagiarism Policy*

The University Academic Honesty Policy Applies in this and all courses. This policy can be found on the University Web Page (<https://www.umass.edu/honesty/>). Appendix B covers plagiarism, cheating, fabrication, and facilitating dishonesty. Students are expected to be familiar with the definitions and examples provided.

Although you are encouraged to discuss course content and assignments with your classmates, but you must ultimately be submitting your own work. 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.

*Inclusivity*

Everyone should feel that they are an integral part of the community and that all individuals and their perspectives are respected. A diversity of perspective and experience provides a valuable source of ideas, problem solving strategies, and engineering creativity. If you feel that your contribution is not being valued or respected for any reason, please speak with me privately. If you wish to communicate with someone else in the College or University, there are several ways to do so anonymously or to provide contact information if you so choose:

1. Notify the University Diversity, Equity, and Inclusion (DEI) Office through the "Report a Climate Incident" form: <https://www.umass.edu/diversity/incident-report-form>  
Note that this form requires sharing name and contact information.
2. Speak with Assistant Dean Dr. Paula Rees ([rees@umass.edu](mailto:rees@umass.edu)).
3. Report an incident anonymously to the College of Engineering Diversity, Equity, and Inclusion Office
  - Climate Concerns and Suggestions – <https://tinyurl.com/UMassEngineerClimate>
  - Classroom Experience – <https://tinyurl.com/UMassEngineerClassroom>
4. Reach out to the departmental DEI Committee
  - Reach out to a member of the BME committee.  
See member list here: <https://bme.umass.edu/diversity>
  - Reach out to a member of the CHE committee.  
See member list here: <https://che.umass.edu/che-diversity-equity-inclusion>
  - Anonymous CEE feedback form:  
<https://cee.umass.edu/cee-diversity-equity-inclusion/feedback>
  - Anonymous ECE feedback form:  
<https://ece.umass.edu/ece-diversity-equity-inclusion>  
(scroll down for feedback link)

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.

*Pronouns and Names*

Everyone has the right to be addressed by the name and pronouns that they use for themselves. Students can indicate their preferred/chosen first name and pronouns on SPIRE, which appear on class rosters. Please let me know what name and pronouns I should use for you if they are not on the roster. A student's chosen name and pronouns are to be respected at all times in the classroom. To learn more, please see this resource: [https://www.umass.edu/stonewall/sites/default/files/pronouns\\_intro.pdf](https://www.umass.edu/stonewall/sites/default/files/pronouns_intro.pdf)

*Gender Respect and Title IX*

The University of Massachusetts Amherst aspires to be a university environment that is free of discrimination, sexual harassment, and sexual violence. Faculty have the responsibility to inform students of resources and reporting options. If you or someone you know has experienced sexual assault, sexual misconduct, or sexual discrimination please see <https://www.umass.edu/titleix/what-to-do> for information about resources and reporting options. A report to the Title IX Coordinator may be made at any time (including during non-business hours) by using the Title IX Coordinator's email ([TitleIXCoordinator@umass.edu](mailto:TitleIXCoordinator@umass.edu)), telephone number (413.545.6124) or mail. UMass Amherst is committed to supporting community members who report concerns of prohibited conduct. Please reach out to me if you would like assistance connecting with any of these resources/options.

*COVID-19*

In accordance with the University's policies, face coverings are optional. Although you are expected to participate in class, please do not come to class if you are not feeling well. Lectures are recorded with Echo 360, and course materials will be posted on Moodle so that you can access them. You should communicate with instructors prior to assignment deadlines if you will not be able to attend class.