STUDY GUIDE

Seminar in Energy & Sustainability Engineering (ENG 471)

Fall 2025

Prof. Leon Liebenberg, supported by several world-renowned specialists

COURSE ORGANIZATION

Instructor / Coordinator: Prof. Leon Liebenberg, Energy and Sustainability Engineering, Department of Nuclear, Plasma & Radiological Engineering, 121 Talbot Laboratory, 104 S. Wright St., Urbana 61801.

E-mail: leonl@illinois.edu Tel: (217) 300-5496

Seminars/Lectures: Seminars will be presented on Wednesdays from 4:00 – 4:50 p.m. in Room 2018 of the Campus Instructional Facility.

Students registered for the in-person (A) format must attend all seminars in person. Students registered for the synchronous online (ONC) format must attend live via Zoom with their cameras turned on. Only students registered as online and off-campus (ONL) may participate asynchronously.

Failure to attend a seminar will result in a grade of 0% for the corresponding quiz or assignment.

Online students may join seminars synchronously via Zoom:

Join Zoom Meeting:
https://illinois.zoom.us/j/86203769733?pwd=woluktMDM2cwgPhHbmdS6xUhTszYmV.1

Meeting ID: 862 0376 9733
Password: 989846

Course description: The course will cover the challenges of developing energy systems and civil infrastructure that are sustainable in terms of resource availability, security, and environmental impact. Guest lecturers focus on: (i) global challenges – future energy demand, sources of sustainable energy, climate change, energy-water nexus, energy and security; (ii) markets, policies and systems – economic incentives, policy and law, life cycle analyses; (iii) opportunities for change – CO_2 sequestration, renewable power, bioenergy feedstocks, biofuels for transportation, energy use in buildings, advanced power conversion, small modular nuclear reactors, and the smart grid.
ENG 471 is a one-credit-hour course for undergraduates or graduates.
Prerequisites: MATH 220 or MATH 221; one of CHEM 104, CHEM 204, PHYS 101, PHYS 211.

Electronic devices (including cell phones and laptops) are not permitted during class. To foster a focused, thoughtful, and fully engaged learning environment, the use of electronic devices is not allowed during lectures. Our sessions rely heavily on active participation, meaningful discussion, and critical reflection—all of which are best supported when we are fully present and free from digital distractions. Students will be asked to leave class if they transgress, also forfeiting the grades for that week's assignments.

Course context: Energy is all-pervasive in the global economy. Every activity directly or indirectly involves the use of energy. And every technological development depends on the availability of energy supplies in a useful form. In 2017, the U.S. spent $1.1 trillion on energy, or 5.8% of its Gross Domestic Product (GDP), and electricity, gas, coal mining, and oil exploration and oil refineries together employ well over 6.7 million people

in the USA alone. The sources, conversion and ultimate end-use of energy have powerful influences on domestic consumers, the economies of individual industries and on the economy of an industrialized nation.

Crucially, to help ensure that we do not exceed a global temperature rise of 2 °C compared to pre-industrial times, we need to reduce global emission from 50 billion tons of CO_2 per annum to 20 billion tons or below by 2050; that is a cut by a factor of 2.5! Let's say that the global economy is three times as big in 2050 as it is now, then the emissions per unit of output would have to be cut by a factor of 2.5 × 3 (i.e., by a factor of around 7 or 8!) by 2050. Emission reductions on this scale would certainly require an energy-industrial revolution, as energy generation and distribution currently make up more than 70% of greenhouse gas pollution (mainly CO_2 and CH_4).

In this course, we will briefly investigate primary sources of energy, including the mineral resources of coal, gas, oil, and nuclear materials, and other (renewable) resources such as solar and geothermal. You will also delve into the processes which may be used to convert these fuels into forms that are easy to transport and convenient for the end-user, such as electricity. Although the focus of the course is on energy conversion, we will also briefly talk about the interrelated social, environmental, economic, and political (or governance) issues. This is after all the main province of the modern engineer and where skills of engineering design and analysis find their greatest employment.

Course assistants ("CAs"): The course assistants will grade all your assignments. You will be able to chat online (via *Piazza*) with your CAs, Ms. Ami Nicodemus and Mr. Gener Atienza, regarding difficulties that you might experience with general theory or assignments. The CAs will, however, not help you to complete quizzes or assignments. You could also attend the CA office hours, as detailed below. Please note that students must show their own calculations, for instance, when asking for assistance. Otherwise, students will be asked to first attempt the problems by themselves and to show evidence of their efforts before the CAs help.

Ms. Ami Nicodemus
amielan2@illinois.edu

Office hours: Mondays, 5 – 6 p.m.

Mr. Gener Atienza
generla2@illinois.edu

Office hours: Fridays, 5 – 6 p.m.

Zoom meeting link for office hour for both course assistants:

Weekly: https://illinois.zoom.us/meeting/tZAtcu-spz4pH93HTz9cU9Pq7m_EeKjacEly/ics?icsToken=DNThlW3hhBwlntXf2gAALAAAAKKIoBRVTjTnZDxsDgHzfah-0-k72b2ikFrwFgxACU9hmiJ1zKqEfIQ7qn6W93WrSDsbWs8GJFZ9Xp0wXDAwMDAwMQ&meetingMasterEventId=IYOLv9R7S0u53M_BJ0dRkA

Join Zoom Meeting:
https://illinois.zoom.us/j/84056495359?pwd=jNvpaVCkpP4dW1Kmk7dtxGnuYKmeNZ.1

Meeting ID: 840 5649 5359
Password: 106624

Your queries: You may also submit queries or questions anytime via *Piazza*. Students are encouraged to view their classmates' questions and to participate in course discussions on *Piazza*.

Sign up at: https://piazza.com/illinois/fall2025/eng471

Private questions should be directed using the "Private" option on *Piazza*, else the whole class will see your query / request. The course assistant or the instructor will respond to your questions as soon as they can.

The course assistants and the instructor will attempt to address your queries promptly from Mondays to Fridays (9 a.m. – 5 p.m.) and less promptly after these hours or over weekends. No queries will be taken during holidays.

Instructor's office hours: Professor Liebenberg's office hours will be held online-only via Zoom on Thursdays from 3:00 p.m. to 3:50 p.m. (excluding holidays):

> Join Zoom Meeting:
> https://illinois.zoom.us/j/84776638551?pwd=4E6uBrLgaDZr5k1SHqTAaFFDSjZGLa.1
>
> Meeting ID: 847 7663 8551
>
> Password: 217479

If office hours do not work for you, then you should send Prof. Liebenberg an email clearly stating your difficulty and attaching any relevant information (such as calculations).

Course webpage (Canvas): https://canvas.illinois.edu/courses/60100

If you have difficulties accessing Canvas, then please contact consult@illinois.edu, *not* the instructor *nor* a course assistant.

Course notes / slides / recordings: Video recordings of each seminar will be uploaded to the course's Canvas site within three hours after the session. The presenter's slides, lecture notes, and any required or recommended reading materials will also be posted on Canvas.

Professor Liebenberg will not remind you to read the materials or watch the recordings. You are expected to manage this independently, using the syllabus on Canvas and the guidance provided in this study guide. This is a guided self-directed course, and taking responsibility for your own learning is essential.

Make sure to follow the syllabus carefully, especially regarding deadlines and assignments.

Video recordings: Each seminar is recorded and uploaded to Canvas as a 50-minute video. Students registered as asynchronous-online must watch the entire recording from beginning to end. Canvas tracks video viewing activity for each student, and this data may be reviewed in the case of any grading concerns.

Please note that some presenters occasionally exceed the 50-minute time limit, and the recording may end abruptly. This is not a problem—you will also have access to the instructor's PowerPoint slides or lecture notes to support your learning. (Exception: Professor Marshak provides only a video recording and no accompanying slides.)

You will use the information from the recordings and notes to complete the post-seminar quizzes, which account for the largest portion of your course grade.

Quizzes and Team-based assignments: As explained earlier, weekly take-home quizzes must be completed in Canvas. You will have a few days to complete each quiz. All quizzes must be done independently. They are worth between 5 and 15 points each.

Quizzes will test your understanding of the *current week's seminar* as well as the *reading assigned for the following week*.

On three occasions during the course, teams will review the past four or five seminars and create a 4 to 8-page *zine* summarizing their insights. Each zine is worth 40 points.

Late submissions of assignments will not be accepted. Any quiz or team-based assignment not submitted by the deadline will receive a grade of 0. There are no exceptions, extensions, or make-up assignments. All assignments are take-home and students are given sufficient time to complete them.

Please follow all assignment submission instructions carefully.

Class Participation Exercises: Each seminar will include a short participation exercise. For in-person (A) and synchronous-online (ONC) students, weekly quizzes will only be graded if the corresponding Class Participation Exercise is submitted and answered correctly. For example, Quiz 1 will only be graded if it is submitted with a completed and correct Class Participation Exercise 1.

- In-person (A) students: Please complete this form during the lecture and hand the finished exercise directly to the instructor.
- Synchronous-online (ONC) students: Complete this assignment during lecture time and submit it on Canvas before the lecture ends.
- Asynchronous-online (ONL) students: This assignment is not required.

Grade appeal policy: If you wish to appeal your grade on a quiz, zine, or class participation exercise, you must submit to the instructor a written grade appeal request within *one week* (7 days) of when the assignment score was posted on Canvas. After this period, all grades are considered final.

Grade appeals for any assignment should be directed to the instructor via email at leonl@illinois.edu. The appeal must include:

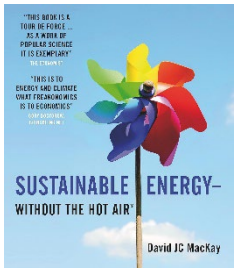
- A *clear statement* of your grade concern.
- A *justification* of how many points you believe you deserve for the specific question(s) in question.

In the event of appeal of a mini project grade, the appeal process must be followed by the entire team. So, when sending your appeal to the instructor, be sure to *copy all your teammates* and ensure that your teammates are in accord with the appeal. Incomplete, incorrectly addressed, or vague appeals will not be considered.

Assessment

60% — 12 Quizzes (independent, solo assignments)
40% — 3 Team-based assignments (production and presentation of zines)

Recommended textbook (free!): "Sustainable Energy-without the hot air," by David MacKay (Bloomsbury Publishing, 2016), freely downloadable.



Course Objectives: Students will be expected to demonstrate their understanding of the material covered in ENG 471 by achieving the following learning objectives:

- Understand the key challenges involved in developing energy systems and infrastructure that are sustainable in terms of resource availability, security, and environmental impact.
- Engage actively in seminars and discussions, and complete pre- and post-seminar quizzes focused on global energy challenges, energy markets, energy policies, energy systems, and opportunities for transformation.
- Effectively communicate technical concepts related to energy systems to a non-technical audience, using the medium of zines.

SYLLABUS – FALL 2025 (subject to change)

Week #	**For the seminar on …**	… you must first **study the readings** (available on Canvas) **for the following lectures at home**, and after attending the seminar you must submit the take-home quiz …	… at the following **assignment due dates** (uploaded before 10 p.m. U.S. Central Time, unless otherwise specified)
1.	27 Aug.	*Climate Change*, by Prof. Ryan Sriver (Atmospheric Sciences)	Quiz 1: Mon. 1 Sept.
2.	3 Sept.	*Growing Bioenergy and Bioproducts*, by Prof. Steve Moose (Crop Sciences)	Quiz 2: Mon. 8 Sept.
3.	10 Sept.	*Small Modular Nuclear Power*, by Prof. Caleb Brooks / Dr. Tim Grunloh (Nuclear, Plasma & Radiological Engineering)	Quiz 3: Mon. 15 Sept.
4.	17 Sept.	*Prairie Research Institute: Technologies to Support Energy Transition*, by Prof Praveen Kumar	Quiz 4: Mon. 22 Sept.
5.	24 Sept.	*Team Presentations of Zines for Seminars 1-4, during lecture time* (Guest: Dr. María Emerson, UIUC Library.)	4 to 8-page zine presentation 1: Mon. 29 Sept.
6.	1 Oct.	*Energy–Water Nexus*, by Prof. Ashlynn Stillwell (Civil and Environmental Engineering)	Quiz 6: Mon. 6 Oct.
7.	8 Oct.	*Evaluating Sustainability*, by Prof. John Abelson (Materials Science and Engineering)	Quiz 7: Mon. 13 Oct.
8.	15 Oct.	*Hybrid Energy Systems: Innovative Research Pathways for Alleviating Global Energy Poverty*, by Professor Joseph Smith (Wayne and Gayle Laufer Endowed Energy Chair at Missouri University of Science and Technology where he led the Energy Research and Development Center and founded the Small Nuclear Modular Reactor Research and Development Consortium. He is also Founder and Chief Technology Officer of Elevated Analytics, LLC and is Past President of the American Institute of Chemical Engineers)	Quiz 8: Mon. 20 Oct.
9.	22 Oct.	*Plant Adaptation to Climate Change*, by Prof. Megan Matthews (Civil and Environmental Engineering)	Quiz 9: Mon. 27 Oct.
10.	29 Oct.	*Team Presentations of Zines for Seminars 6-9, during lecture time*	4 to 8-page zine presentation 2: Mon. 3 Nov.
11.	5 Nov.	*Electric Vehicles and Vehicle-to-grid technology*, by Prof. George Gross (Electrical & Computer Engineering)	Quiz 11: Mon. 10 Nov.
12.	12 Nov.	*Engineering for Impact: How to Make a Difference through Renewable Energy Projects*, by Mr. Steve Vavrik, Founder and ex-CEO of Earthrise Energy.	Quiz 12: Mon. 17 Nov.
13.	19 Nov.	*Unconventional Hydrocarbons*, by Prof. Steve Marshak (Earth Science & Environmental Change)	Quiz 13: Mon. 1 Dec.
	22 Nov. – 30 Nov.	THANKSGIVING BREAK (no lectures)	
14.	3 Dec.	SPECIAL SEMINAR IN THE FORM OF A LAB VISIT: *Advanced battery storage systems*, by Prof. Paul Braun, Prof. Ben Zahiri, Dr. Rajen Basu (Materials Science & Engineering)	Quiz 14: Mon. 8 Dec.
15.	10 Dec.	*Team Presentations of Zines for Seminars 11-14, during lecture time.* (Guest: Dr. María Emerson, UIUC Library.)	4 to 8-page zine presentation 3: Mon. 16 Dec.

ZINE-BASED REFLECTION PROJECT

Purpose: To creatively synthesize and communicate (via "zines") insights from the seminar series to a non-specialist audience.

Details: Please see Zines section in the Assignments folder on Canvas.

Overview: Throughout the semester, teams-of-three will create a total of **three zines** that reflect on and communicate the main themes, insights, and societal relevance of the course seminars. The zines should aim to translate technical content into engaging, accessible, and visually appealing mini-publications for a general audience (e.g. high school students, community members, local decision-makers).

This project encourages reflection, creativity, and public communication skills.

Timeline & Deliverables

Seminar Block	Zine Topic	Due Date	Public Showcase
Seminars 1–4	Zine #1: *What's at Stake in Energy & Climate?*	**24 Sept.** (in class)	**11 Oct. 2025 at Urbana Small Press Fest** *(optional selection)*
Seminars 6–9	Zine #2: *Technologies & Trade-Offs in the Energy Transition*	**29 Oct.** (in class)	Internal peer review
Seminars 11–14	Zine #3 (Cumulative): *The Future of Sustainable Energy*	**10 Dec.** (in class)	**Spring 2026 UIUC Library Display** *(top zines selected)*

On the third occasion, teams combine their prior two zines (with refinement and additions based on seminars 11–14) into a single, high-impact cumulative zine—either handmade (paper) or digital.

Public Engagement Opportunities

1. **Small Press Fest (11 October 2025)**
    - A selection of Zine #1 submissions will be invited for display at Urbana's *Small Press Fest*. Participation is optional but highly encouraged.
2. **UIUC Main Library Showcase (Spring 2026)**
    - Top cumulative zines (Zine #3) will be selected for public exhibition in the UIUC Main Library foyer.
    - Selected students may be invited to briefly present or discuss their work during the launch.

Support & Resources

You can view zines on the UIUC campus:

- Main Library's "Orange Room", https://www.library.illinois.edu/using-library-spaces/study-space-directory/the-orange-room/

Check out the Main Library's Zine Cart in the Orange Room. The zine cart is filled with all sorts of arts and crafts materials that anyone can use to make their own zines. There's also a "Take a Zine, Leave a Zine" community box!

- Ricker Library of Architecture & Art, https://guides.library.illinois.edu/artists-books-and-zines/zines/collections
- Urbana-Champaign Independent Media Center, https://www.ucimc.org/

There is no wrong way to make a zine... but here are a few tips, pointers, and resources to help you make a paper-based or a digital zine:

- University of Cornell Library, https://guides.library.cornell.edu/zines101/make?utm_source=chatgpt.com
- Worcester Polytechnic Institute, https://libguides.wpi.edu/zines/zinemaking?utm_source=chatgpt.com
- Barnard College, https://zines.barnard.edu/zine-basics/how-make-zine
- *Creative Independent*'s "How to Make a Zine" guide: https://thecreativeindependent.com/guides/how-to-make-a-zine/?utm_source=chatgpt.com

If you would like in-person guidance from a zine specialist, please contact Dr. María Emerson at the UIUC Library: memersn2@illinois.edu

Peer-evaluations of Team Performance: Your team's success depends on everyone doing their part. While your team will receive one shared grade for each assignment, you can highlight teammates who worked especially hard—or raise concerns about unequal participation—through peer evaluations. This helps keep things fair and ensures accountability.

Each team member will *anonymously* rate the contributions of the others. If there are *n* team members, each team member will have a total of $(n-1)\times 100$ points to assign to the other team members. You will be able to assign a maximum of 130 points and a minimum of 70 points per person. So, if your team comprises three members $(n=3)$, you must allocate a *total* of $(3-1)\times 100 = 200$ points to the other two members of your team.

This system helps reward those who go above and beyond, and fairly reflect if someone didn't do their share.

To prevent surprises at the end of the semester, teams will complete peer evaluations after each of the three mini-projects. You'll also be given a *team agreement* template to fill out before starting your first project. In it, you'll outline how you plan to work together and how you'll evaluate each other's contributions.

Peer evaluation scores will be used to adjust your individual score. Here's how it works:

- Your average peer score will be divided by 100 to get a *multiplier.*
- Your final score = *team score* × your *multiplier*.

Examples:

- If your teammates give you an average score of 100, your multiplier is 1.0, and you'll get the full team score.
  → Team score = say, 94% → Your score = 94%
- If your average score is 80, your multiplier is 0.8.
  → Team score = say, 94% → Your score = 75.2%
- If your average score is 120, your multiplier is 1.2.
  → Team score = say, 94% → Your score = 112.8%

COURSE POLICIES

Late Work Policy:

a. Project deliverables must be submitted on time to ensure the effectiveness of the peer feedback process. Late submissions will not be accepted, and no make-up assignments will be provided. Any late or missing submission will receive a grade of 0%—applied to all members of the team.
   Teams have several weeks to plan and execute their work, so it's important not to leave tasks until the last moment. Teams should plan thoroughly and have contingencies in place to handle situations where a team member may be unable to contribute due to extenuating circumstances, such as illness.
b. Late homework assignments or non-completion of class participation exercises will receive a 0% grade. Students will have around 6 days to complete each quiz, and solutions will be posted after the submission deadline passes.
c. Extensions for homework assignments or class participation deadlines may be granted at the instructor's discretion, provided the student gives advance notice by email—except in cases of emergency. Valid reasons for requesting an extension include, but are not limited to:
   i. serious illness, serious injury, or death in the student's *direct* family (not grandparents, uncles, or cousins, for instance);
   ii. birth of a child for which the student is identified as a parent on the birth certificate;
   iii. required duty in the U.S. military (active-duty, reserve, or in a National Guard unit activated by the President or a governor), required service in a foreign military organization acting in concert with the United States, or service under provisions of the Volunteer Emergency Worker Job Protection Act;
   iv. participation in, or travel to, an obligatory AFROTC, NROTC, or ROTC event;
   v. participation in, or travel to, varsity or DRES-sanctioned athletic events (excluding fencing, bowling, and other club sports);
   vi. participation in, or travel to, an organized extracurricular activity sanctioned by the College of Engineering or one of its departments, for which a full-time or emeritus faculty member of the College of Engineering attests that the student's participation is essential;
   vii. observance of a religious holiday;
   viii. any excuse allowed by the UIUC for students participating in online learning.

If the student was so seriously ill or injured as to be unable to communicate their intentions to the instructor prior to the beginning submission deadline, the advance notification requirement will be waived if the student subsequently provides satisfactory documentation of such incapacitation. The student will do well to also reach out to an emergency dean in the Office of the Dean of Students to enquire the available care resources to help you navigate your challenge. In these circumstances, students should also contact their advisor.

In those cases where advance notification of lateness or non-submission has been provided, or where such notice has been waived according to the provisions of the second sentence of the above paragraph, late submissions of non-submissions will be classified as unexcused unless the student provides satisfactory after-the-fact documentation, as indicated below.

For illness or injury of the student, a satisfactory letter stating that the student was medically unfit to complete the quiz by the submission deadline must be provided by an appropriate medical practitioner (C.N.P., D.D.S., D.M.D., D.O., D.P.M., M.D., O.D., or P.A.) after the quiz submission deadline. *Medical bills, prescriptions, e-mail or letters from friends or relatives, letters from naturopaths, chiropractors, psychologists, and mental health counselors, "visit slips" from McKinley Health Center, and records of calls to McKinley Health Center's Dial-a-Nurse program (with or without endorsement by an "emergency dean" in the Office of the Dean of Students) are among the types of documentation that will not be accepted.*

For serious illness, serious injury, or death in the student's family, the student's relationship to the ill, injured, or deceased party must be established, along with documentation of the illness, injury, or death.

For birth of a student's child, a photocopy of an original birth certificate, showing the student as a parent, is required.

For military duty, copies of valid military orders are required.

For participation in or travel to varsity or DRES-sanctioned athletic events or AFROTC/NROTC/ROTC events, a satisfactory letter from the Division of Intercollegiate Athletics, DRES, or the commanding officer of the detachment is required.

For participation in, or travel to, an organized extracurricular activity sanctioned by the College of Engineering or one of its departments, a satisfactory letter from the faculty sponsor is required.

Independent work: The work you submit in this course, in individual or team assignments, must reflect exclusively the effort of those listed in the submitted materials and must not come significantly from the work of others. You are encouraged to study and discuss the course materials and assignments with your peers. But you are responsible for ensuring that you follow the rules laid out in this study guide and in the University of Illinois' Academic Integrity Policy. Also see *Academic Integrity* on page 17 of this study guide.

Communication etiquette: We welcome communications concerning possible errors, or constructive suggestions about the materials. Please do not contact us to request increases in your assigned grade, outside of errors in grading.

All class communications will use your UI NetID email; do not use any alternate such as gmail as such mail will be ignored.

Use of Generative AI Technology

You are allowed to use generative AI tools such as ChatGPT (OpenAI), Microsoft Copilot/Bing Chat, Google Gemini, and others to help you learn. These tools can explain concepts, give you extra practice, and help clarify things you're unsure about. However, you must use them carefully and responsibly.

These AI tools often give incomplete, incorrect, or misleading answers, especially when it comes to advanced reasoning or technical calculations—which are common in this course. To spot these mistakes, you need to already understand the topic well, like a qualified instructor or experienced engineer would. Since students are still learning, it's easy to accept wrong answers as correct, which can seriously harm your learning or even teach you false information.

You may use AI tools to support your learning, but only if you follow the rules below and the honor code on each assignment.

Permitted Uses of AI (for Learning, Not Grading)

You may use AI tools in these two ways:

1. **As a personal tutor**
   You can ask the AI to explain concepts, break down techniques step by step, list key ideas, give extra examples, or create self-test questions for you.
2. **As a feedback tool**
   You can ask the AI to review your work, point out possible mistakes, or suggest how to improve your explanations or calculations.

AI Use That Is Not Allowed

To maintain academic integrity, you must follow these rules:

- **Do not use AI tools during graded work**, including quizzes, zine-based project work, or class participation exercises. You may use AI tools to help you understand readings, prepare for teamwork, or study in general. But you cannot use AI to generate answers or solve graded questions—unless your instructor explicitly allows it in the assignment instructions or honor code.

- **Do not submit any work created by AI**.
  Everything you turn in must be your own original thinking and effort. You must not include AI-generated solutions or text, even if you edited them.
- **Be prepared to explain your work**.
  Your instructor may ask you to explain your submission in person or in writing. If you can't explain it clearly, you may receive a score of zero and could be reported for academic misconduct.

Documentation and Citation of AI Use

If you use AI tools in your learning:

- **Keep a record**: Save or log the prompts you used, the AI's responses, and how you used them.
- **Be ready to share this record** if your instructor asks.

If an assignment *does* allow AI use, you must:

- Cite your AI use properly, using APA style. This includes the text of your prompt and a reference to the tool used (e.g., ChatGPT).
- Do not cite AI as a source of facts. AI can invent information. Always verify facts and cite the original sources they come from.

Final Notes on AI and Academic Integrity: Misusing AI tools—by submitting AI-generated work or using AI when it's not allowed—is a violation of academic integrity. Any suspected misuse will be investigated and may result in penalties under the Illinois Student Code. Please read the University of Illinois System's Generative AI Guidance for Students to learn more about your responsibilities.

Final grade

At the end of the semester, letter grades are determined based on composite numerical scores, weighted as previously described. The instructor does not have a predetermined "target" grade distribution, and it may vary significantly from semester to semester. Additionally, there is no "curving" of grades in this class. Grades will be rounded to the nearest whole number. For example, a final grade of 93.2% will be rounded down to 93%, while a final grade of 93.6% will be rounded up to 94%.

Letter grades at semester's end

Grade meaning	Refined letter scale	Numerical scale of marks
Excellent	A+	97 to 100
	A	94 to <97
	A-	90 to <94
Good	B+	87 to <90
	B	84 to <87
	B-	80 to <84
Adequate	C+	77 to <80
	C	74 to <77
	C-	70 to <74
Marginal	D+	67 to <70
	D	64 to <67
	D-	60 to <64
Inadequate	F	<60

OTHER COURSE & UNIVERSITY RULES / POLICIES & ADVICE

Teamwork: Effective teamwork requires empathy and respect. You should be willing and able to 'bend' your minds to recognize where others are coming from and what is important to them, and then to 'blend' with them, moving in a unified direction. You will learn techniques to be more receptive and connected, and to have greater influence whilst accommodating others. Rather than opposing or agreeing with other people, you will learn how to accept and acknowledge the other's position until you can understand what is important about it. This requires a willingness to flex, bend, and search to understand someone else's perspective. Once you understand their perspective, you can pivot and create an opening for that person to understand what is important to you.

Team members will communicate with each other using social media platforms of their own choosing. Historically, students enjoy collaborating using the following platforms: Discord, Zoom, Google Docs, WeChat, GroupMe, and Miro. You and your teammates should soon agree on your chosen method of online collaboration and then promptly get into that routine.

It is strongly suggested that teams use roving team leaders. For instance, a student could be team leader for the first mini-project, followed by another student leading the next mini-project, and yet another team member leading the third mini-project. This will help ensure that no single person dominates the team's actions.

Assigned team members will remain unchanged for the duration of the semester. Teams should however note that they must accommodate late-registered students into their teams, as directed by the instructor or TA. Teams may also have to negotiate lost team members as some students might drop the course. So, although ideal team sizes are 3 students, this number might become more (i.e., 4 students) depending on class size. Also, some students might join the class late and asked to merge with an existing team. The instructor and TAs will do their utmost to minimally disrupt existing teams. The full cooperation of every student is expected when forming or changing teams.

Grading the work of large teams and small teams: When grading the mini projects of regularly sized teams (with three team members), we expect the same *quality* (and correctness) of work compared to larger teams (say with four team members); but, for larger teams we expect a greater *quantity* of work than that of a larger team.

Uncooperative team members: In this engineering class, effective teamwork is paramount for successful collaboration and project completion. Students are encouraged to actively engage in open communication, share diverse perspectives, and contribute their unique skills to foster a collaborative and innovative environment. However, should any student fail to cooperate with their team or disrupt the collaborative process, appropriate measures will be taken. These measures include intervention by the instructor, potential reassignment of team roles, and, if necessary, disciplinary actions in accordance with class and University policies. This ensures a fair and conducive learning environment that promotes the development of both technical and interpersonal skills crucial for success in the field of engineering.

Academic integrity: The highest academic integrity is expected. Academic violations will however be dealt with according to the UIUC Student Code, Article 1, Part 4. Violations will be reported to the relevant College and, where relevant, to the FAIR system.

Academic dishonesty may result in a failing grade. Every student is expected to review and abide by the Academic Integrity Policy: https://studentcode.illinois.edu/article1/part4/1-401/. Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask the instructor(s) if you are ever in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

- All students are responsible to refrain from infractions of academic integrity, conduct that may lead to suspicion of such infractions, and conduct that aids other in such infractions. "I did not know" is not an excuse.
- The following are academic integrity infractions (http://www.provost.illinois.edu/academicintegrity/students):
    - ✓ Cheating: using or attempting to use unauthorized materials.

- ✓ Plagiarism: representing the words, work, or ideas of another as your own.
- ✓ Fabrication: falsification or invention of information, including citations.
- ✓ Facilitating infractions of academic integrity, helping, or attempting to help another commit infraction.
- ✓ Bribes, favors, and threats: actions intended to affect a grade or evaluation.
- ✓ Academic interference: tampering, altering, or destroying educational material or depriving someone else of access to that material.
- ✓ Note: All infractions are documented in the campus-wide FAIR database.

- If you have difficulty completing your classwork, you should consult the instructor by showing him evidence of your attempts to solve the specific problem/s. However, most lecture time has been set aside exactly for this type of activity; use it to your full advantage.

- Copying (in whole or in part) another student's (or team's) quiz, project work, or exam is not permitted. Copying solutions from web-based answer keys such as Chegg is an honor code violation.
- If you choose to discuss your work with a fellow student, it should be a discussion in which one teaches the other, or where both work to a mutual understanding. The discussion should however relate to general concepts and not address the specifics of the quiz questions.
- It is not acceptable to give a fellow student your completed project work or quiz or other assignment so that they can copy it. In such a case, both you and your fellow student will have committed an academic violation.
- It is also unacceptable to copy work from a student who completed the course previously.
- You should properly cite references and sources in your written reports. Cases of cheating or plagiarism will be handled severely.

  Also, be wary to correctly use quotation marks for sentences or important data that did not originate with you. Further, paraphrasing should be kept to a minimum. When used, the paraphrased section should be specifically identified by citing the original source. It is not sufficient to simply provide a list of references but not indicate where a specific quotation or paraphrase was employed. In addition, all sources should be fully cited. As is done in scientific and engineering literature, you should briefly acknowledge in writing any significant discussions or interactions you had regarding the work you are reporting on.

- Ignorance of academic integrity or uncertainty regarding the instructor's wishes are not justifiable reasons for academic violations. If you are uncertain of the instructor's wishes or intentions, you should consult with him *before* acting.

Sexual Misconduct Reporting Obligation: The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX Office. In turn, an individual with the Title IX Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options.

A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: wecare.illinois.edu/resources/students/#confidential.

Other information about resources and reporting is available here: wecare.illinois.edu.

Community of Care: As members of the Illinois community, we each have a responsibility to express care and concern for one another. If you come across a classmate whose behavior concerns you, whether in regards to their well-being or yours, we encourage you to refer this behavior to the Student Assistance Center (217-333-0050 or http://odos.illinois.edu/community-ofcare/referral/). Based on your report, the staff in the Student Assistance Center reaches out to students to make sure they have the support they need to be healthy and safe.

Further, we understand the impact that struggles with mental health can have on your experience at Illinois. Significant stress, strained relationships, anxiety, excessive worry, alcohol/drug problems, a loss of motivation, or problems with eating and/or sleeping can all interfere with optimal academic performance. We encourage all students to reach out to talk with someone, and we want to make sure you are aware that you can access mental

health support at the Counseling Center (https://counselingcenter.illinois.edu/) or McKinley Health Center (https://mckinley.illinois.edu/).

Mental Health: Significant stress, mood changes, excessive worry, substance/alcohol misuse or interferences in eating or sleep can have an impact on academic performance, social development, and emotional wellbeing. The University of Illinois Urbana-Champaign offers a variety of confidential services including individual and group counseling, crisis intervention, psychiatric services and specialized screenings which are covered through the Student Health Fee.

If you or someone you know experiences any of the above mental health concerns, it is strongly encouraged to contact or visit any of the University's resources provided below. Getting help is a smart and courageous thing to do for yourself and for those who care about you.

- Counseling Center (217) 333-3704
- McKinley Health Center (217) 333-2700
- National Suicide Prevention Lifeline (800) 273-8255
- Rosecrance Crisis Line (217) 359-4141 (available 24/7, 365 days a year)

Academic Integrity: The University of Illinois at Urbana-Champaign Student Code should also be considered as a part of this syllabus. Students should pay particular attention to Article 1, Part 4: Academic Integrity. Read the Code at the following URL: http://studentcode.illinois.edu/.
Academic dishonesty may result in a failing grade. Every student is expected to review and abide by the Academic Integrity Policy: https://studentcode.illinois.edu/article1/part4/1-401/. Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask the instructor(s) if you are ever in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

Religious Observances*:* The Religious Observance Accommodation Request form is available at http://odos.illinois.edu/community-ofcare/resources/docs/Religious-ObservanceAccommodation-Request-Form.pdf. Submit the form to the instructor and to the Office of the Dean of Students (helpdean@illinois.edu) by the end of the second week of the course; in the case of exams or assignments scheduled after this period, students should submit the form to the instructor and to the Office of the Dean of Students as soon as possible.

Disability-Related Accommodations*:* To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, you may visit 1207 S. Oak St., Champaign, call 333-4603, e-mail disability@illinois.edu or go to https://www.disability.illinois.edu. If you are concerned you have a disability-related condition that is impacting your academic progress, there are academic screening appointments available that can help diagnosis a previously undiagnosed disability. You may access these by visiting the DRES website and selecting "Request an Academic Screening" at the bottom of the page.

Family Educational Rights and Privacy Act (FERPA)*:* Any student who has suppressed their directory information pursuant to Family Educational Rights and Privacy Act (FERPA) should self-identify to the instructor to ensure protection of the privacy of their attendance in this course. See https://registrar.illinois.edu/academic-records/ferpa/ for more information on FERPA.

Inclusion: The intent is to raise student and instructor awareness of the ongoing threat of bias and racism and of the need to take personal responsibility in creating an inclusive learning environment. The Grainger College of Engineering is committed to the creation of an anti-racist, inclusive community that welcomes diversity along a number of dimensions, including, but not limited to, race, ethnicity and national origins, gender and gender identity, sexuality, disability status, class, age, or religious beliefs.

The College recognizes that we are learning together in the midst of the Black Lives Matter movement, that Black, Hispanic, and Indigenous voices and contributions have largely either been excluded from, or not recognized in, science and engineering, and that both overt racism and micro-aggressions threaten the well-being of our students and our university community.

The effectiveness of this course is dependent upon each of us to create a safe and encouraging learning environment that allows for the open exchange of ideas while also ensuring equitable opportunities and respect for all of us. Everyone is expected to help establish and maintain an environment where students, staff, and faculty can contribute without fear of personal ridicule, or intolerant or offensive language. If you witness or experience racism, discrimination, micro-aggressions, or other offensive behavior, you are encouraged to bring this to the attention of the course director if you feel comfortable.

You can also report these behaviors to the Bias Assessment and Response Team (BART) (https://bart.illinois.edu/). Based on your report, BART members will follow up and reach out to students to make sure they have the support they need to be healthy and safe. If the reported behavior also violates university policy, staff in the Office for Student Conflict Resolution may respond as well and will take appropriate action.

Emergency response recommendations can be found at the following website: http://police.illinois.edu/emergency-preparedness/. You are encouraged to review this website and the campus building floor plans website within the first 10 days of class. http://police.illinois.edu/emergencypreparedness/building-emergency-action-plans/

Enjoy the course!