STUDY GUIDE

Seminar in Energy & Sustainability Engineering (ES 471)

Fall 2026

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

Engineers help shape the future not only
through the systems they design,
but also through the ideas they communicate,
the decisions they inform,
and the visions they inspire.

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

Course webpage (Canvas): https://canvas.illinois.edu/courses/71820

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

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.

The syllabus on page 6 provides a detailed sequence of readings, seminars, quizzes, and three mini-projects.

Electronic devices (including cell phones, tablets, and laptops) are not permitted during class. Our seminar is designed to be a place for conversation, curiosity, and thoughtful engagement. To help create an environment in which everyone can listen carefully, contribute meaningfully, and reflect deeply, electronic devices are not permitted during class sessions. I ask that you give your full attention to our guest speakers and to one another so that we can make the most of this shared learning experience.

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/89235464944?pwd=eDRVqVcTpLjSeEopnTdgzrMQQjb1Ny.1
Meeting ID: 892 3546 4944
Password: 630840

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 Description: ES 471 introduces students to the technological, environmental, economic, and societal challenges of designing sustainable energy systems. Through a series of seminars presented by internationally recognized experts from academia and industry, students explore contemporary topics including climate change, bioenergy, advanced nuclear power, electromechanical energy conversion, the energy-water nexus, sustainability assessment, technologies supporting the energy transition, plant adaptation to climate change, electric vehicles, engineering leadership, unconventional hydrocarbons, and advanced battery storage.

Rather than focusing on individual technologies in isolation, the course examines how engineering decisions shape society, the environment, and the future of the global energy system. Emphasizing systems thinking throughout, students are encouraged to critically evaluate the opportunities, trade-offs, and interconnected nature of energy technologies while developing an appreciation for the complex decisions that will define a sustainable energy future.

Weekly readings, quizzes, discussions, and creative team activities encourage students to engage actively with guest speakers and one another, reflect critically on the ideas presented, and synthesize perspectives from multiple disciplines.

ES 471 is a one-credit-hour course open to undergraduate and graduate students.

Prerequisites: MATH 220 or MATH 221; and one of CHEM 104, CHEM 204, PHYS 101, or PHYS 211.

Course context: Energy underpins every aspect of modern society. It powers our homes, businesses, industries, transportation systems, hospitals, communication networks, and food production. Every technological innovation, every economic activity, and every nation's prosperity ultimately depend on the availability of reliable, affordable, secure, and sustainable energy.

At the same time, the world is undergoing one of the greatest engineering transformations in history. Growing energy demand, climate change, resource constraints, environmental stewardship, energy security, and rapid technological innovation are reshaping the way energy is produced, stored, distributed, and consumed. Addressing these challenges will require far more than the development of new technologies. It will require engineers who can think across disciplinary boundaries, evaluate complex trade-offs, communicate effectively with diverse stakeholders, and design solutions that are technically sound, economically viable, environmentally responsible, and socially equitable.

This seminar introduces students to many of the technologies, ideas, and decisions that are shaping the global energy transition. Through presentations by internationally recognized experts, students will explore topics including climate change, bioenergy, advanced nuclear power, electromechanical energy conversion, the energy-water nexus, sustainability assessment, technologies supporting the energy transition, climate adaptation, electric vehicles, engineering leadership, unconventional hydrocarbons, and advanced battery storage.

Throughout the semester, the emphasis will not simply be on understanding individual technologies, but on appreciating how they interact within larger energy systems. Students will be encouraged to think critically about uncertainty, competing objectives, and the societal consequences of engineering decisions. By the end of the course, they should have developed a broader systems perspective and a deeper appreciation of the opportunities and responsibilities that engineers have in helping to shape a sustainable energy future.

Course assistants ("CAs"): The course assistants will grade all your assignments. You will be able to chat online (via *Piazza* or *Canvas*) with your CAs, *Mr. Vijeet Bharambe* and *Mr. David Ceballos,* 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 or explanations, 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.

Vijeet Bharambe
vb31@illinois.edu

Office hours: Mondays, 5 – 6 p.m.

David Arellano Ceballos
davida9@illinois.edu

Office hours: Fridays, 5 – 6 p.m.

Zoom meeting link for office hour for both CAs:

Please download and import the following iCalendar (.ics) files to your calendar system.

Weekly:
https://illinois.zoom.us/meeting/tZwvfu6tqT0rGdeRy41sKqiUp1jUxZxFHqGL/ics?icsToken=DKnSxiUAbekKZRpUMwAALAAAAGy43M4m-p36CrG6v8kj8axqNApzYZy7mqVEQ20-xp3oLxE5TPIoSOSZI7SuFWYjv07W1APEQNXyziPVYjAwMDAwMQ&meetingMasterEventId=xCzSVjmhQB-Otq7OQ9TSrg
Join Zoom Meeting
https://illinois.zoom.us/j/88297576133?pwd=HSDgwJP8d4HxRYG65WAX28FimJV2Lp.1
Meeting ID: 882 9757 6133
Password: 471

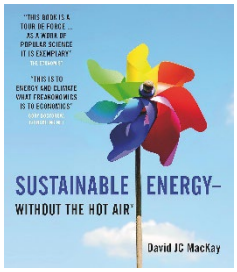
Your queries: You may also submit queries or questions anytime via *Piazza* or *Canvas*.
Students are encouraged to view their classmates' questions and to participate in course discussions on *Piazza*.

Sign up at: https://piazza.com/class/mskgcqpyuh84be

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.

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



Course materials and video recordings: All course materials are available through the course Canvas site. These include instructor slides and notes, video recordings, and all required and recommended reading materials.

The course follows a *guided self-directed learning* model. While the instructor provides the structure, resources, and guidance needed for success, you are responsible for managing your own learning by engaging with the course materials and completing all required activities in accordance with the syllabus and assignment deadlines. Accordingly, reminders to read assigned materials or watch videos will generally not be issued.

We record each presenter's one-hour seminar, later available on Canvas. Students enrolled in the *in-person (A)* and *synchronous-online (ONC)* sections are expected to participate in each seminar in real time, while students enrolled in the *asynchronous-online (ONL)* section are required to watch the recorded presentations. In-person and synchronous-online students are also encouraged to revisit the recordings after class to reinforce key concepts, reflect on the discussions, and deepen their understanding of the material.

"Quizzes" and Team-based "Engineering Communication Briefs": Weekly take-home quizzes are completed in Canvas and must be done independently, i.e. solo. You will have several days to complete each quiz. Quizzes are worth between 10 and 15 points and assess your understanding of the current week's seminar as well as the readings assigned for the following week.

- Quiz 1 is worth 10 points because there are no assigned preparatory readings before the first seminar.
- Quizzes 2–13 are worth 15 points each: 10 points assess your understanding of the current week's seminar, and 5 points assess your preparation through the assigned reading for the following week.
- Quiz 14 is worth 15 points, but all 15 points relate to the final week's seminar because there are no assigned readings following the last seminar.

On three occasions during the course, teams will synthesize the preceding four seminars by producing an Engineering Communication Brief that summarizes key insights. Each Engineering Communication Brief is worth 50 points.

Note that late submissions are not accepted. Any quiz or team-based assignment not submitted by the deadline will receive a grade of 0. There are no extensions, exceptions, or make-up assignments. Students are responsible for carefully following all submission instructions.

Grade appeal policy: If you wish to appeal your grade on a quiz or Engineering Communication Brief, 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

Students will be assessed throughout the semester using a combination of quizzes, Engineering Communication Briefs, and in-class reflections.

Assessment Component	%
Quizzes × 12 + one course survey	53
Engineering Communication Briefs × 3	41
In-class reflections × 12	6
Total	**100**

The assessment structure has been designed to encourage continuous engagement throughout the semester.

For each seminar, students are expected to:

- *prepare* by completing the assigned readings and the pre-seminar quiz, which is part of the previous week's post-seminar quiz;
- *participate* by engaging actively during the seminar and completing a brief in-class reflection; and
- *reflect* by completing the post-seminar quiz.

The three Engineering Communication Briefs provide opportunities to synthesize ideas across multiple seminars and to communicate engineering concepts effectively to different audiences.

Course Objectives: Upon successful completion of ES 471, students should be able to:

- Explain the technological, environmental, economic, and societal challenges associated with developing energy systems that are reliable, secure, resilient, equitable, and sustainable.
- Evaluate contemporary energy technologies, policies, and engineering solutions from a systems perspective by recognizing their opportunities, trade-offs, and broader implications for society and the environment.
- Engage thoughtfully in seminars and discussions with internationally recognized experts, demonstrating intellectual curiosity, critical reflection, and an appreciation for diverse perspectives on the global energy transition.
- Communicate complex energy systems concepts effectively to both technical and non-technical audiences through discussions, quizzes, and the creation of creative communication artifacts that synthesize technical knowledge in engaging and accessible ways.
- Develop a broader systems perspective that enables informed and responsible engineering decision-making in the context of an increasingly complex and interconnected global energy system.

SYLLABUS – FALL 2026 (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.	26 Aug.	*Climate Change*, by Prof. Ryan Sriver (Atmospheric Sciences). Big question: Why must our energy system change?	Quiz 1: Mon. 31 Aug.
2.	2 Sept.	*Growing Bioenergy and Bioproducts*, by Prof. Steve Moose (Crop Sciences). Big question: How can nature help power a more sustainable future?	Quiz 2: Mon. 7 Sept.
3.	9 Sept.	*Small Modular Nuclear Power*, by Dr. David Sikorsky (Nuclear, Plasma & Radiological Engineering). Big question: What role should advanced nuclear play in tomorrow's energy system?	Quiz 3: Mon. 14 Sept.
4.	16 Sept.	*Sustainable AI Infrastructure: Powering the Intelligence Revolution*, by Prof. Jian Huang (Electrical & Computer Engineering). Big question: How can we meet AI's growing demand for computing without creating an unsustainable demand for energy?	Quiz 4: Mon. 21 Sept.
5.	23 Sept.	*Team presentations of instructor-selected Engineering Communication Brief 1, during lecture time*	Engineering Communication Brief 1: Mon. 21 Sept.
6.	30 Sept.	*Energy–Water Nexus*, by Prof. Ashlynn Stillwell (Civil and Environmental Engineering). Big question: Why are energy and water fundamentally interconnected?	Quiz 6: Mon. 5 Oct.
7.	7 Oct.	*Evaluating Sustainability*, by Prof. John Abelson (Materials Science and Engineering). Big question: How should engineers measure success in sustainable energy systems?	Quiz 7: Mon. 12 Oct.
8.	14 Oct.	*Prairie Research Institute: Technologies to Support Energy Transition,* by Prof Praveen Kumar. Big question: How can research accelerate the energy transition?	Quiz 8: Mon. 19 Oct.
9.	21 Oct.	*Plant Adaptation to Climate Change*, by Prof. Megan Matthews (Civil and Environmental Engineering). Big question: How does nature adapt to a changing climate, and what can we learn from it?	Quiz 9: Mon. 26 Oct.
10.	28 Oct.	*Team presentations of instructor-selected Engineering Communication Brief 2, during lecture time*	Engineering Communication Brief 2: Mon. 26 Oct.
11.	4 Nov.	Electric Vehicles, by Prof. George Gross (Electrical & Computer Engineering). Big question: What role should electric vehicles play in a sustainable transportation system?	Quiz 11: Mon. 9 Nov.
12.	11 Nov.	*Hearts and Minds: Projects are Campaigns*, by Steve Vavrik, CEO of Earthrise Energy. Big question: Why do some great ideas change the world while others do not?	Quiz 12: Mon. 16 Nov.
13.	18 Nov.	*Unconventional Hydrocarbons*, by Prof. Steve Marshak (Earth Science & Environmental Change). Big question: How do we responsibly manage today's energy resources while building tomorrow's?	Quiz 13: Mon. 30 Nov.
	21 Nov. – 29 Nov.	FALL BREAK (no lectures)	
14.	2 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). Big question: How do we store energy for a clean, resilient, and reliable future?	Quiz 14: Mon. 7 Dec.
15.	9 Dec.	*Team presentations of instructor-selected Engineering Communication Brief 3, during lecture time.* *Award Ceremony.*	Engineering Communication Brief 3: Mon. 7 Dec.

The goals of the series of 12 seminars may be summarized as follows:

Seminar Stage	Student Mindset	Engineer's Role	Central Question
Seminars 1–4	Understand	Educator	*What is happening, and why should society care?*
Seminars 6–9	Evaluate	Advisor	*What should we do, and why?*
Entire seminar series	Envision	Leader	*What future should we strive to create, and how do we get there?*

SERIES OF ENGINEERING COMMUNICATION BRIEFS

Working in assigned teams of three, you will produce a series of three Engineering Communication Briefs. For each assignment, your team may select the communication medium that you believe is most appropriate for the intended audience.

The emphasis throughout is not on artistic ability, but on communicating technically accurate information clearly, persuasively, and appropriately for a particular audience. The most effective communication artifact is not necessarily the longest or the most visually elaborate; it is the one that best achieves its intended purpose.

The suggested lengths below are provided as general guidance rather than strict requirements.

After Seminars 1–4

Engineering Communication Brief 1: ***Understanding the Challenge***

Explain why the energy system is changing and what society should understand about the technologies discussed during Seminars 1–4.

Intended audience: A concerned member of the public with little or no technical background.

Possible communication media:

- Illustrated fact sheet
- Infographic
- Frequently Asked Questions (FAQ)
- "Five Things Everyone Should Know..."
- Myth-versus-fact sheet
- Public information brochure

You can choose whichever communication format you believe best serves the audience.

Suggested Length: A communication artifact equivalent to approximately 300–500 words, presented on one letter-sized page (or an equivalent digital format).

After Seminars 6–9

Engineering Communication Brief 2 – ***Evaluating the Options: Advising Decision-Makers***

Recommend a strategy for supporting the energy transition based on the insights gained from Seminars 6–9.

Intended Audience (choose one): Mayor, State Governor, University President, School Superintendent, Chief Executive Officer, Utility Manager

Possible communication media:

- Executive memorandum
- Policy brief
- Newspaper editorial
- Illustrated briefing note
- Decision matrix with explanatory narrative

- Systems map with supporting commentary
- Professional poster

Suggested Length: A communication artifact equivalent to approximately 500–800 words, presented over one or two letter-sized pages.

After Seminars 11–14

Engineering Communication Brief 3 – *Looking Back from 2050: Looking Back from 2050 – Envisioning a Sustainable Future*

Your communication artifact should describe not only what the world of 2050 looks like, but also the technological innovations, engineering decisions, policy developments, societal changes, and leadership that made this future possible. Draw upon insights from across the entire seminar series (12 seminars), synthesizing the ideas that you believe were most influential in shaping the energy transition.

Intended Audience: Select an audience that best matches your chosen communication medium.

Possible communication media:

- Newspaper front page (published in 2050!)
- Museum exhibit panel
- Magazine feature article
- TED Talk storyboard
- Conference poster
- Children's educational booklet
- Public awareness campaign
- Investor pitch deck
- Engineering roadmap
- Interactive web page mock-up

Suggested length: A communication artifact equivalent to approximately 600–1,000 words, presented in a format appropriate to the intended audience.

Assessment of the Three Engineering Communication Briefs

Please refer to detailed grading rubrics in the assignment folder on Canvas. Communication artifacts will be evaluated primarily on:

- Technical accuracy
- Depth of understanding
- Appropriateness for the intended audience
- Clarity and organization
- Quality of synthesis across seminar topics
- Evidence supporting conclusions
- Professional presentation

Visual appearance is important only insofar as it enhances communication. Artistic ability is not being assessed!

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.

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 (i.e., Engineering Communication Briefs") 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 assignments or non-completion of class participation "reflection" 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 quizzes or Engineering Communication Brief 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 academic 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 direct family (e.g., father, mother, sibling), 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.

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

AI tools such as ChatGPT, Claude, Microsoft Copilot/Bing Chat, Google Gemini, and others may help you learn. However, 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 adhere to the following requirements:

- **Do not use AI tools during graded work**.
  AI tools may *not* be used to complete graded assessments, including quizzes and Engineering Communication Briefs, unless their use is explicitly authorized in the assignment instructions or Honor Code. You are welcome to use AI to help you understand course materials, prepare for teamwork, or support your general learning, but you may not use AI to generate answers or complete graded assignments.
- **Submit only your own original work.**
  All submitted work must represent your own thinking and effort. You must not submit AI-generated text, analyses, solutions, or other content as your own, even if you have edited or paraphrased it. If you wish to include an AI-generated image, you must first obtain your instructor's permission.
- **Be prepared to explain your work**.
  Your instructor may ask you to explain any part of your submission, either orally or in writing. If you are unable to demonstrate a clear understanding of the work you submitted, you may receive a score of zero on the assignment and may be referred for investigation under the University's academic integrity procedures.

Documentation and Citation of AI Use

If you use AI tools to support your learning, you should:

- **Keep a record.** Save or document the prompts you entered, the AI-generated responses, and how you used them.
- **Be prepared to share this record.** Your instructor may ask you to provide this documentation.

If an assignment explicitly permits the use of AI, you must:

- **Cite your AI use appropriately.** Follow APA guidelines (or any citation style specified by your instructor). Your citation should identify the AI tool used (e.g., ChatGPT), the date of use, and the prompt(s) that substantially contributed to your work.
- **Cite original sources—not AI—for factual information.** AI tools can generate inaccurate or fabricated information. Always verify factual claims using reliable, original sources and cite those sources rather than the AI tool itself.

Misusing AI tools—including submitting AI-generated work as your own or using AI when it is not permitted—constitutes a violation of academic integrity. Any suspected misuse will be investigated and may result in penalties under the University of Illinois Student Code.

Please familiarize yourself with the University of Illinois System's Generative AI Guidance for Students, which explains your rights and responsibilities when using AI tools in your academic work.

Final grade

At the end of the semester, letter grades will be assigned based on your overall weighted numerical score, as described previously in this study guide.

There is no predetermined target grade distribution for this course, and grade distributions may vary considerably from one semester to the next. Likewise, grades will not be curved.

Final numerical grades will be rounded to the nearest whole percentage point before letter grades are assigned. For example, a final score of 93.2% will be rounded down to 93%, while a final score 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 in *Engineering Communication Briefs*

The strongest engineering teams are *not* those in which everyone thinks alike, but those in which different perspectives are understood, valued, and integrated into better decisions. *Great engineers learn not only to think together, but also to appreciate what others care about and to act collectively toward a shared purpose.* Throughout your career, you will work with people who think differently, communicate differently, and bring different experiences and expertise to the table. Learning to collaborate effectively is therefore one of the most important outcomes of this course.

Working Effectively with Others

Successful teamwork requires empathy, curiosity, and respect. Be willing to *bend* your thinking to understand where others are coming from and what matters to them and then *blend* your ideas in a shared direction. Rather than immediately agreeing with or opposing another person's viewpoint, first seek to understand it. Ask thoughtful questions. Listen carefully. Acknowledge what is important to the other person before explaining your own perspective.

Once you understand someone else's viewpoint, you are in a much better position to communicate your own ideas and work together toward a stronger solution. Throughout this course, you will practice listening, building consensus, and integrating diverse perspectives. These skills are every bit as important as technical expertise and are essential for professional engineering practice.

Team Communication

Each team should decide early in the semester how it will communicate outside class. Teams are free to choose whichever collaboration platform best suits their needs. Previous classes have successfully used platforms such as Discord, Zoom, Google Docs, WeChat, GroupMe, and Miro.

Once your team has selected a platform, establish a regular communication routine and use it consistently throughout the semester.

Team Leadership

Teams are encouraged to rotate leadership responsibilities throughout the semester. For example, one student might coordinate the first Engineering Communication Brief, another the second, and another the third. Rotating leadership gives every team member an opportunity to develop leadership skills while helping to ensure that no single individual dominates the team's work.

Team Membership

Assigned teams will normally remain together for the duration of the semester. However, adjustments may occasionally be necessary. Teams may need to accommodate students who register late or adapt if a team member withdraws from the course.

The preferred team size is *three students*, although some teams may consist of four students depending on class enrollment. The instructor and teaching assistants will make every effort to minimize disruptions, and all students are expected to cooperate fully when teams are formed or adjusted.

Expectations for Larger Teams

The expected quality, technical accuracy, and professionalism of submitted work are the same for all teams, regardless of size. However, teams with four members are expected to produce a correspondingly greater quantity or scope of work than teams with three members.

Professional Conduct

Every team member is expected to contribute constructively, communicate respectfully, and support the success of the team. Differences of opinion are a normal—and valuable—part of engineering, but they should always be handled professionally and respectfully.

If a student consistently fails to contribute, refuses to cooperate, or significantly disrupts the team's ability to function effectively, the instructor may intervene. Depending on the circumstances, this may include coaching, reassignment of responsibilities, adjustments to individual grades where appropriate, modification of team arrangements, or referral under applicable University policies.

These measures are intended not as punishment, but to ensure a fair, respectful, and productive learning environment in which every student can learn, contribute, and succeed.

Academic Integrity

The University of Illinois 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.

Students with Disabilities

The University of Illinois Champaign-Urbana, is committed to ensuring that all students, including students with disabilities, do not experience barriers to learning and participating fully in class. Students who have a letter of accommodation from DRES are advised to share that with instructors as soon as possible to ensure accommodation needs can be discussed and met.

To obtain disability-related academic accommodations, disabled students must contact Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, please visit 1207 S. Oak Street, Champaign, call 217.333.1970, email disability@illinois.edu, or visit the DRES website.

Family Educational Rights and Privacy Act (FERPA)

See http://registrar.illinois.edu/ferpa for more information on Family Educational Rights and Privacy Act (FERPA).

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 offers a variety of confidential services including individual and group counseling, crisis intervention, psychiatric services, and specialized screenings which are covered through the Health Service 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 (815) 720-4953 (available 24/7, 365 days a year)

If you are in immediate danger, call 911.

*This statement is approved by the University of Illinois Counseling Center

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 regarding their well-being or yours, we encourage you to refer this behavior to the Connie Frank CARE Center (formerly the Student Assistance Center) in the Office of the Dean of Students. You may do so by calling 217-333-0050 or by submitting an online referral. Based on your report, staff in the Connie Frank CARE Center will reach out to offer support and assistance.

Further, as a Community of Care, we want to support you in your overall wellness. We know that students sometimes face challenges that can impact academic performance (examples include mental health concerns, food insecurity, homelessness, personal emergencies). Should you find that you are managing such a challenge and that it is interfering with your coursework, you are encouraged to contact the Connie Frank CARE Center (formerly the Student Assistance Center) in the Office of the Dean of Students for support and referrals to campus and/or community resources.

Disruptive Behavior

Behavior that persistently or grossly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students' ability to learn and an instructor's ability to teach. A student responsible for disruptive behavior may be required to leave class pending discussion and resolution of the problem and may be reported to the Office for Student Conflict Resolution (https://go.illinois.edu/ReportMisconduct; conflictresolution@illinois.edu; 333-3680) for disciplinary action.

Emergency Response Recommendations

Emergency response recommendations and campus building floor plans can be found at the following website: https://police.illinois.edu/em/run-hide-fight/. I encourage you to review this website within the first 10 days of class.

Religious Observances

It is the policy of the University of Illinois Urbana-Champaign to reasonably accommodate its students' religious beliefs, observances, and practices that conflict with a student's class attendance or participation in a scheduled examination or work requirement, consistent with state and federal law. Students must make requests for accommodation in advance of the conflict to allow time for both consideration of the request and alternate procedures to be prepared. Requests should be directed to the instructor. The Office of the Dean of Students provides an optional resource on its website to assist students in making such requests.

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 supportive measures, resources, 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.

Veterans and Military Students

As a military-friendly institution, and per federal regulations and Illinois statutes, the University of Illinois Urbana-Champaign has established policies and procedures to accommodate military-connected students. In addition to the support available at the Chez Veterans Center (https://chezveteranscenter.ahs.illinois.edu/), members of the National Guard or Reserves and active-duty military personnel with military obligations (e.g., deployments, training, drills) are encouraged to communicate these, in advance whenever possible, to the instructor. The policy for Excused Absences and Departure from the University for U.S. Military or other U.S. National Defense Services can be found at https://studentcode.illinois.edu/article3/part3/3-313.

Enjoy the course!