ENGR 1301: Introduction to Engineering
CRNs: 26110, 25332, & 25333
Fall 2026

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If you are sick (or potentially sick), stay home.
Email me – don't come to campus.

COURSE DESCRIPTION

ENGR 1301: Introduction to Engineering - This course will introduce students to their choice of engineering majors at UCA and elsewhere. It will provide students a broad picture of what it means to be in engineering. It will introduce students to the essential tools for further study in engineering. Students will be introduced to the ethical application of engineering principles throughout this course.

COURSE INFORMATION

CRN: ALL, Lecture: Mon & Wed, 10:00 - 10:50 AM, Lewis Science Center (LSC) Room 168
CRN 25333, Lab: Mon, 3:00 - 4:15 PM, Conway Corp Center for Sciences (CCCS) Room 112
CRN 26110, Lab: Wed, 1:00 - 2:15 PM, Conway Corp Center for Sciences (CCCS) Room 112
CRN 25332, Lab: Wed, 2:30 - 3:45 PM, Conway Corp Center for Sciences (CCCS) Room 112

Final Exam: Monday, December 7, 2026 from 8:00 - 10:00 AM, in LSC 168.

Office Hours: LSC 015 Monday - Friday: 8:00 - 9:00 AM, Monday 1:00 - 2:00 PM, Tuesday: 2:30 - 4:00 PM, or by appointment. Drop-ins at other times are welcome, but availability cannot be guaranteed. Email is preferred for appointments or other communication - I tend to not check my voicemail. I will respond within 24 hours during the week or by the next workday if on a weekend.

Required Texts & Materials: Textbook: *Introduction to Engineering: Foundations for Your Success* (PDF) available on Brightspace. Reader: *All Systems Red: Murderbot Diaries*; Wells; ISBN: 9781250214713. The reader will be used for ethics readings/discussions/assignments. Students are expected to have the textbook and reader listed above as well as a quad ruled composition notebook, scientific calculator, and the usual writing utensils.

Course Organization: The textbook and course are organized into three parts. Part I: Engineers, Design, and Ethics asks what engineering is, how engineers solve problems, and what responsibilities engineers have to the public. Part II: Quantitative & Computational Foundations develops the mathematical and computational tools needed for later engineering coursework, including

quantitative reasoning, trigonometry, vectors, and programming logic. Part III: Professional Skills focuses on the practices that help engineers succeed in school and in the profession, including responsible use of AI, teamwork, technical communication, academic success strategies, and career development.

COURSE LEARNING OUTCOMES

By the end of this course, students should be able to:

1. Describe engineering as a profession and identify the roles, responsibilities, and career pathways of engineers.
2. Apply an iterative engineering design process to define a problem, identify constraints, generate alternatives, build and test a solution, and evaluate tradeoffs.
3. Apply foundational quantitative, graphical, computational, and programming skills to introductory engineering problems.
4. Analyze engineering decisions using professional codes of ethics and consideration of safety, public welfare, and broader societal impacts.
5. Communicate technical work clearly and use appropriate engineering documentation and presentation practices.
6. Work effectively as a member of an engineering team and use appropriate learning, professional, and technological tools, including generative AI, responsibly and critically.

GRADING

This course uses a two-stage assessment model: open-resource technical work followed by individual verification of understanding. Homework, laboratory work, and project development may make appropriate use of textbooks, notes, computational tools, and generative AI as specified for each assignment. Exams provide individual verification that you can explain, justify, and apply the underlying concepts and methods independently. A: 90–100%, B: 80–89%, C: 70–79%, etc. Grades will be based on the following:

Component	Description	Total Points Possible
Exams	3 exams @ 100 pts each	300 pts
Lab & Ethics Reports	5 reports @ 60 pts each	300 pts
Design Project	1 group project @ 200 pts	200 pts
Homework	10 HW Assignments @ 10 pts each	100 pts
Attendance	100 pts for 100% attendance, etc	100 pts
Total	100%	1000 pts

Attendance: Technical courses such as physics and engineering are cumulative and difficult to learn without being present, on time, and actively engaged in class and laboratory activities. Attendance is part of your final grade. If you are sick, have a family emergency, or university sanctioned event please let me know in advance (or as soon as possible) via email. Documentation for an absence will be necessary. Students who have informed me about an excused absence can make up missed work. Late work is not accepted unless for an excused absence. Turn in what you have by the due date / time. We'll discuss if it is not at the level you want. If you are sick or potentially sick, stay home and email me.

Exams, Homework, & Reports: The course involves lectures and hands-on lab activities. Assignments, exams, homework, and reports will be submitted for credit. Please follow the format requested in the specific assignment and be mindful of the policy on generative AI (such as ChatGPT, or Gemini) below.

Design Project: Students will complete a team-based engineering design project that applies the design process developed in this course, including problem definition, constraints, concept development, prototyping, testing, iteration, and technical communication. Detailed project requirements and grading criteria will be provided separately.

Software: Appropriate software and environments for programming the Parallax BoE-bot will be provided. Additional software for word processing, spreadsheets, or presentations can be found in your UCA Google account, LibreOffice, or MS Office. 3D CAD modeling software such as TinkerCAD and FreeCAD will be available.

Engineering Ethics: In addition to UCA's Academic Integrity policy we will also be mindful and knowledgeable of the IEEE Code of Ethics, the National Society of Professional Engineers (NSPE) Code of Ethics, among others. A copy of the IEEE code can be found here: https://www.ieee.org/about/corporate/governance/p7-8 and the NSPE Code can be found here: https://www.nspe.org/career-growth/ethics/nspe-code-ethics-engineers

Disclaimer: All standard disclaimers apply. The instructor reserves the right to modify the course policies, assignments, due dates, etc. as necessary or appropriate for meeting the goals of the

course. Hot glass looks like cold glass. Do not look into laser with remaining eye. If you mess up, 'fess up. Don't be a d^3x/dt^3 (jerk).

UNIVERSITY POLICIES

Academic Integrity: The University of Central Arkansas affirms its commitment to academic integrity and expects all members of the university community to accept shared responsibility for maintaining academic integrity. Students in this course are subject to the provisions of the university's Academic Integrity Policy, approved by the Board of Trustees as Board Policy No. 709 on February 10, 2010, and published in the *Student Handbook*. Penalties for academic misconduct in this course may include a failing grade on an assignment, a failing grade in the course, or any other course-related sanction the instructor determines to be appropriate. Continued enrollment in this course affirms a student's acceptance of this university policy.

Americans with Disabilities Act: The University of Central Arkansas adheres to the requirements of the Americans with Disabilities Act. If you need an accommodation under this Act due to a disability, please contact the Office of Accessibility Resources and Services (OARS), 450-3613.

Building Emergency Plan: An Emergency Procedures Summary (EPS) for the building in which this class is held will be discussed during the first week of this course. EPS and Building Emergency Plan (BEP) documents for most buildings on campus are available at https://uca.edu/go/bep-library. Every student should be familiar with emergency procedures for any campus building in which they spend time for classes or other purposes.

Title IX: In furtherance of its core values — academic vitality, integrity, and diversity — UCA is dedicated to promoting a campus community free from discrimination. Title IX of the Education Amendments Act of 1972 requires all educational institutions to address gender-based discrimination on campus, and UCA implements these Federal requirements through a fair, consistent, and appropriate process of investigation and adjudication. Please see UCA's Title IX website (https://uca.edu/titleix/) for the university's policy, relevant forms, training opportunities, and related information.

Student Handbook: It is advisable to refer to the Student Handbook for important policies not specifically detailed in the syllabus, for example: the Sexual Harassment Policy and other Academic Policies.

Student Course Experience Survey: The Student Course Experience Survey is a crucial element in helping faculty achieve excellence in the classroom and the institution in demonstrating

that students are gaining knowledge. Students may complete surveys for courses they are taking starting on Monday, November 16, 2026, through the Sunday after finals week by logging in to myUCA and clicking on the Feedback Hub.

POLICY ON GENERATIVE AI

Generative AI tools are permitted and encouraged in this course as part of an *open-resource learning environment*. These tools can be useful for brainstorming, explaining concepts, developing or debugging code, improving technical communication, and exploring alternative solutions. They should be used as aids to thinking and learning, not as substitutes for your own understanding and engineering judgment.

You are responsible for everything you submit, regardless of whether generative AI was used to help produce it.

Assignment-Specific Use of AI: Assignments and activities may specify one of the following levels of AI use:

1. **No AI:** Generative AI may not be used to complete the activity. This level will normally apply to exams, quizzes, and other individual assessments intended to demonstrate your own knowledge or skills.
2. **AI-Assisted:** Generative AI may be used as a resource. You remain responsible for understanding, verifying, and defending all submitted work. Meaningful AI assistance must be disclosed as described below.
3. **AI-Required:** Use of generative AI is part of the assignment and instructions will specify how it should be used and documented.

Unless an assignment states otherwise, take-home work is considered **AI-Assisted**. Exams, quizzes, and individual in-class assessments are considered **No AI** unless explicitly stated otherwise. Assignment-specific instructions always take precedence over this general policy.

Your Responsibilities When Using AI:

1. **Understand Your Work:** You must be able to explain and defend the reasoning, calculations, code, design decisions, and conclusions in anything you submit. AI-generated work that you cannot explain is not acceptable.
2. **Verify the Output:** Generative AI can produce incorrect calculations, flawed code, fabricated references, and convincing but false explanations. Check technical claims against

your own calculations, experiments, reliable references, datasheets, standards, or other appropriate sources.

3. **Use Engineering Judgment:** AI may overlook physical constraints, safety considerations, uncertainty, manufacturability, cost, ethical concerns, or other important requirements. Evaluating these factors remains your responsibility.
4. **Protect Information:** Do not provide an AI system with personal information, another student's work, proprietary information, restricted data, or other material that you do not have permission to share.
5. **Develop Your Own Skills:** Learning engineering requires practice, including struggling with difficult problems and learning from mistakes. Use AI to support that process rather than bypass it.

Disclosing AI Assistance: When generative AI contributes substantively to submitted work, include a brief **AI Use Statement** describing the tool and how it was used. For example:

> *AI Use Statement: I used ChatGPT to brainstorm design alternatives and to help debug my PBasic code. I independently checked the calculations and tested the final code.*

Routine spelling or grammar correction does not need to be disclosed unless an assignment states otherwise. If an assignment requires prompts, transcripts, or other documentation of AI use, those requirements will be stated in the assignment.

Generative AI should not be used as an authoritative source for technical facts. When information from an AI system contributes to your work, locate, verify, and cite the appropriate original or reliable source.

Bottom Line: Generative AI is a **powerful but fallible engineering tool**. Learning to use it effectively, critically, transparently, and ethically is part of becoming an engineer. Your submitted work must ultimately demonstrate **your understanding, judgment, and responsibility**.

Accreditation Board for Engineering and Technology (ABET) Outcomes:

The Engineering Physics program at UCA is accredited by the Engineering Accreditation Commission of ABET. The program has the following mission statement, program educational objectives, and student outcomes.

Mission Statement: The mission of the Engineering Physics program is to provide the highest quality education for students in the principles of Physics and Engineering with hands-on practical applications relevant to industry. This foundation prepares our students for careers tackling complex problems in multidisciplinary areas that are at the forefront of advancements in science and technology.

Program Educational Objectives:

1. Practice fundamental physics and engineering principles in the workforce or through graduate level education.
2. Develop and innovate new knowledge or technology either individually or as part of a team.
3. Demonstrate leadership through active participation in work, professional societies, non-profit organizations, or community engagement.
4. Commit to continued learning through pursuit of professional licensure, professional certification, or completion of graduate studies.

Student Outcomes: Students in the program are expected to know and be able to do the following by the time of graduation:

Outcome 1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

Outcome 2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

Outcome 3: An ability to communicate effectively with a range of audiences.

Outcome 4: An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

Outcome 5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

Outcome 6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

Outcome 7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Student Outcomes formally assessed by this course: 2, 4, & 5.