UNITED STATES AIR FORCE ACADEMY

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
ECE 215S Syllabus - Spring 2025

Overview

Understanding complex systems like the F-35, hypersonic weapons, and GPS is essential for leaders in the world's most advanced military. Regardless of your academic discipline or career field, ECE215S will equip you with the tools to analyze these systems and tackle technical challenges as they arise (because they will!), preparing you for success in the Air Force, Space Force, and beyond.

Instructors

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Course Goals

In ECE215S, cadets will explore the principles of electrical and computer engineering to support well-informed decision-making. By the end of the course, cadets will be equipped to develop systems-level solutions for air, space, and cyberspace operations while addressing real-world constraints.

Course Prerequisites

CompSci 110 and Math 142. Can be co-requisites; chat with your instructor if an issue.

Course Materials

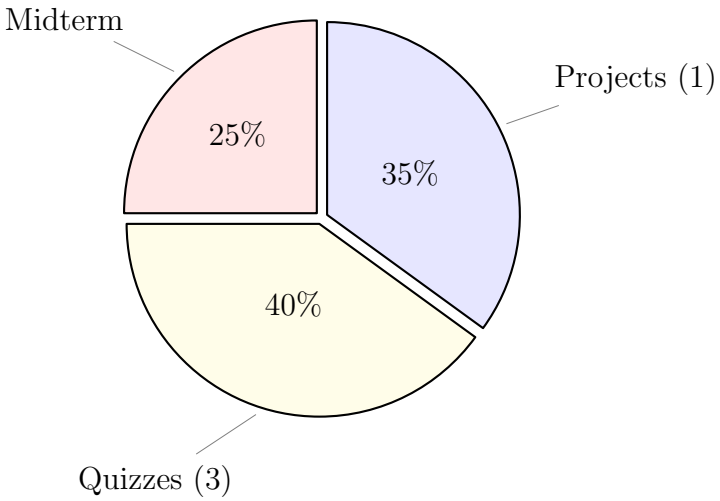
All readings will be provided electronically.

Course Communication

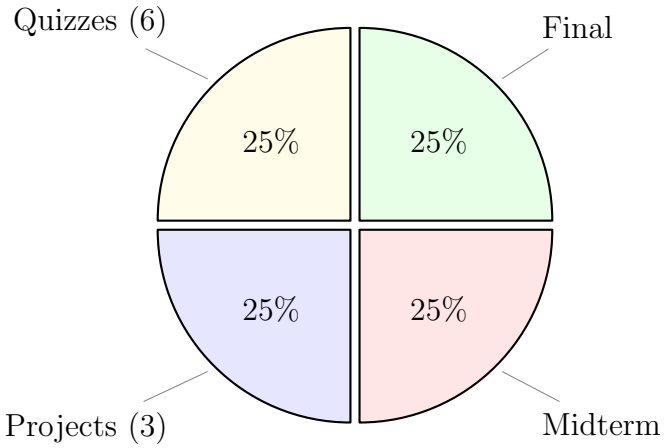
- **Gradescope** Cadets will be enrolled in the course on Gradescope. All Quizzes, Projects, and examinations will be submitted, graded, and/or returned through Gradescope.
- **Teams** Most communications regarding the course will be through Teams, including any due dates and schedule changes.
- **Email** Communications that require formal documentation should be submitted via email such as SCAs and notifications of bedrest.

The grade breakdown for the course at Prog and for your final grade are shown below. A number in parentheses indicates the number of items for that graded event.

Prog Grade Weighting



Final Grade Weighting



Grade Scale

F	D	C-	C	C+	B-	B	B+	A-	A
$\leq 60\%$	70%	73%	77%	70%	83%	87%	90%	93%	100%

This course will utilize an alternative grading format. The intent is that your grades will be fairer, more accurate, and more meaningful. This grading format should also improve your learning and retention of concepts taught throughout the semester.

This course will focus on specific learning objectives, which are key concepts required to succeed in this course and retain knowledge for future academic and professional endeavors. The Learning Objectives section of this syllabus details all learning objectives for this course. Your mastery (i.e. understanding) of each learning objective will be assessed with quizzes, projects, and examinations (midterm and final).

Quizzes Quizzes will be given to ensure you are mastering learning objectives at an appropriate pace for success in ECE215S. Key things to know:

- Quizzes will consist of several problems. Material will be covered during lectures and through assigned reading.
- Some objectives may be covered in multiple problems across multiple quizzes to improve your retention of the concept.
- Grading for quizzes will utilize an alternative grading system:
  - For each quiz problem, you may earn a 1 (correct with at most trivial math errors) or 0 (incorrect) for each problem.
  - If you receive a 0 on a quiz problem, you will be provided meaningful feedback on how to improve your understanding of that learning objective. The correct answer will not be provided.
  - If you receive a 0, you have the opportunity to improve your score within one week of the returned, graded quiz *if and only if* you have submitted your assessment problems with clear effort by the original due date.
  - To change your score from a 0 to a 1, you must demonstrate full understanding of the objective by making changes to correct your quiz problem and submitting the correction with a shareable link through a regrade request on Gradescope.
  - If you do not complete a submission by the deadline for a quiz problem or you clearly did not put effort into your submission, you can earn a retake. To earn a retake, you can read a scientific publication or article chosen by your instructor, give a 3-5 minute summary of the paper to the class, and facilitate a meaningful discussion with your instructor and/or classmates regarding the paper. *Please, put in effort and submit your quiz answers on time!* Also take special note of the absences policy and adhere to due dates!
  - Each quiz problem will be worth 1 point. A quiz with 3 problems will therefore be worth a total of 3 points.
  - The final quiz score for the course will be based on the number of quiz problems given throughout the semester. Example: if there are a total of 20 quiz questions across 6 quizzes for the entire semester and you scored a 1 for 18 quiz questions and 0 for 2 quiz questions, your quiz grade for the course is therefore $\frac{18}{20} = 90.0\%$

  - Be sure to seek help from your instructor early if you worry you may receive a score of 0.

- Ungraded practice problems will be provided with answers to prepare for your quizzes.
- Quizzes will be individual effort.
- You may only use a calculator and class resources to complete your quiz. Search engines, ChatGPT, or other AI assistants are not allowed during quizzes.
- Quizzes will be assigned, submitted, graded, and returned via Gradescope.
- Check Gradescope for official deadlines.

Projects Projects will solidify your understanding of learning objectives through engineering applications. Key things to know:

- Projects will be completed as a group with group sizes detailed within each Project Assignment.
- Projects will be scored similar to quizzes, where you will receive a score of 1 (correct with at most trivial math errors) or 0 (incorrect).
- To earn a 1, all specifications listed in the instructions must be completed correctly as laid out in your Project Assignment.
- If you receive a 0, you have the opportunity to improve your score by correcting your original submission within one week of the returned, graded project *if and only if* you have submitted your project with clear effort by the original due date.
- There will be dedicated work day(s) during lecture periods for each project; however, work outside of class will be required to complete the projects.
- Projects will be assigned, submitted, graded, and returned via Gradescope.
- There are no restrictions regarding resources used to complete your labs. Be cautious that ChatGPT is known to provide incorrect methodology and answers to engineering problems - be sure to use generative AI tools responsibly (i.e. as a learning tool, not as a way to complete your project).
- Check Gradescope for official deadlines.

Examinations Your midterm and final represent a culmination of your learning throughout this course. Key things to know:

- The midterm and final are one-time examinations. As such, there will be no retakes offered.

- Each problem within the midterm and final will receive one of the following scores:
  - 1: The correct mathematical framework is chosen, given data is correctly used in the terms of the framework, and solutions are neat, organized, and easy to grade. Only trivial (simple math) errors are present, if any. Understanding of concepts is therefore evident.
  - .5: The correct mathematical framework is chosen, but the given data is *incorrectly* used in the terms of the framework. Solutions are neat, organized, and easy to grade. Partial understanding of concepts is therefore evident.
  - 0: The correct mathematical framework is *not* chosen, solutions are *not* neat, organized, and easy to grade, or no work completed for the problem. An understanding of concepts is therefore *not* evident.
- Your score for each examination is the number of points earned out of points possible. Example: if there are ten problems on the final and you earn a 1 on eight problems, a 0 on one, and a .5 on one, you would earn an 8.5/10, i.e. 85% on your final exam.
- The midterm and final examinations are individual effort.
- The midterm will be a take-home examination. It will be assigned, graded, and returned via Gradescope.
- The final will occur during finals week as scheduled by the registrar. It will be handwritten and submitted directly to the final exam proctor.
- Your instructor will detail resources allowed prior to each examination.

1. **Instructor Philosophy**

   As your instructors, we believe learning should be both challenging and rewarding, no matter your academic background. We're here to support your success by fostering an inclusive environment and working alongside you. If you put in the effort and communicate with us, we'll ensure you have the tools and support you need to succeed. If something doesn't feel right, don't hesitate to speak up — we are committed to making this a space where everyone thrives.

2. **Academic Honor**
   Your honor is extremely important. The course's academic security policies are designed to help you succeed in meeting academic requirements while practicing the honorable behavior our country rightfully demands of its military. Do not compromise your integrity by violating academic security or by taking unfair advantage of your classmates.

3. **Extra Instruction**
   EI is one of the best and easiest ways to succeed in this class; EI is recommended and welcomed early and often.

4. **Absences**
   In the event of an absence, communicate with your instructor **beforehand.** Please expect all quizzes, projects, and other submissions to be due as scheduled, regardless of absence type. Should you have extenuating circumstances such as no internet while on approved travel or too ill to complete work while on bedrest, you must communicate an alternate plan with your instructor and ensure that your instructor has approved the alternate plan **before** the deadline for quizzes, projects, or other submissions have occurred. If the original deadline passes and you have not submitted your assignment without an approved extension from your instructor, you will receive a 0 and you will not receive any retake opportunities.

5. **Collaboration**
   Collaboration (not copying) is highly encouraged unless your instructor provides direction otherwise. A good litmus test to distinguish between copying and collaboration is as follows: students must be able to explain every step indicated on their submitted work to be considered collaboration and not copying. All help received on work submitted for grading must be documented in accordance with the course documentation policy below.

6. **Generative AI**
   Your instructors are pro-AI unless noted otherwise (example: quizzes); however, we expect you to use generative AI platforms (ChatGPT, etc) as a tool rather than to complete your assignments for you. Similar to the collaboration policy: a good litmus test is that you must be able to explain every step indicated on your submitted work to be considered responsible use of generative AI. It will become clear quickly if you are using AI irresponsibly: ChatGPT is not very good at math and if you aren't following in class and seeking EI, you should not miraculously have a perfect answer on a quiz. If you utilize generative AI on any assignment, include a documentation statement as outlined in the Documentation Policy.

7. **Documentation**
   In accordance with the Dean's policy for documentation, all ECE assignments must have a documentation statement. The documentation statement should be clearly identified with the word "Documentation." If you did not collaborate, then the statement "Documentation: None," is appropriate. In the instance that you utilize a generative AI platform to assist you on your assignment, your documentation statement should contain the platform you utilized, *how* you used it, and the link to the conversation if available. Example "Documentation: ChatGPT to write a for loop in python. Link here." Assignments without a documentation statement or with an incomplete documentation statement will receive a 0 with retake policies as described in the Grading section.