ECEN 404 – Spring 2025 Syllabus

Course Information

Course Number: ECEN 404
Course Title: Electrical Design Lab II
Sections: 901 – 905

	Section, Day and Time:		Location:
Lecture:	901:	MW: 12:40 pm – 01:30 pm	ETB1020
	902:	MW: 01:50 pm – 02:40 pm	ETB1020
	903:	MW: 03:00 pm – 03:50 pm	ETB1020
	904:	MW: 04:10 pm – 05:00 pm	ETB1020
	905:	MW: 05:20 pm – 06:10 pm	ETB1020
Labs:	901:	Thur: 08:00 am – 10:50 am	ZACH113
	902:	Thur: 11:10 am – 02:00 pm	ZACH113
	903:	Thur: 02:20 pm – 05:10 pm	ZACH113
	904:	Wed: 05:30 pm – 08:20 pm	ZACH113
	905:	Mon: 08:00 am – 10:50 am	ZACH113

Credit Hours: 3 hours

Course Description

Continuation of ECEN 403; application of the design process and project engineering as practiced in the industry; team approach to the design process; completion of the project based on the proposal from ECEN 403; includes testing, evaluation, and report writing.

Course Prerequisites

Grade of C or better in ECEN 403 and senior classification.

Special Course Designation

This course has a special designation of a communication-intensive (C) course. As such, a student must have a passing grade in the presentation components to pass the course.

Instructor Details

Instructor: Prof. John Lusher II, P.E.
Office: WEB 244B
Email: john.lusher@tamu.edu
Office Hours: Monday from 8:00 am – 11:00 pm, Thursday at the FEDC from 8 am to 4 pm, or by appointment

Instructor: Prof. Wonhyeok Jang
Office: WEB 310MD
Email: wjang777@tamu.edu
Office Hours: Wednesday from 2:00 pm – 3:50 pm, or by appointment

Instructor: Prof. Prasad Enjeti
Office: WEB 301F
Email: enjeti@tamu.edu
Office Hours: Tuesday 11:00 am – 12:00 pm and Wednesday 4:00 pm – 5:00 pm, or by appointment

Instructor: Prof. Stavros Kalafatis
Office: WEB 205E
Email: skalafatis-tamu@tamu.edu
Office Hours: Monday and Wednesday from 4:00 pm – 5:00 pm, or by appointment

Instructor: Prof. Kevin Nowka
Office: WEB 235A
Email: kjnowka@tamu.edu
Office Hours: Monday from 2:00 pm – 3:00 pm, Wednesday from 4:00 pm – 5:00 pm, or by appointment

Course Learning Outcomes

At the end of the course, the student should be able to demonstrate skills in the categories below:

1. Design Methodology
    a. Apply scientific methods and engineering principles learned in other courses to design, analyze, and demonstrate a non-trivial engineering system or process to meet the desired need.
    b. Describe the activities that occur during each stage of the design process.
    c. Analyze project needs to produce quantitative design requirements.
    d. Develop technical skills, including PCB design and soldering.

2. Societal Impact
    a. Recognize the ever-present role of design in human activity.
    b. Analyze and address risks associated with a concept.

3. Project Management
    a. Demonstrate the ability to work in a team environment.
    b. Assess risk in a project and assign appropriate contingency.
    c. Develop and execute the project development and validation plan.
    d. Communicate and justify design choices through written and oral assignments. Oral presentations will be approximately 500 unique words, with 10-15 minutes per team per presentation. Evaluation/feedback will be taking place bi-weekly/weekly by a team of 4 professors, 7 TAs, and 30-40 peers.

Grading Policy

Grading Scale: A (90-100), B (80-89), C (70-79), D (60-69), F (< 60)
Extra Credit: There will be no extra credit assigned in this course

Bi-weekly presentation updates	25% [5% per update]	Rubric: Technical merit (50%) Progress, skills, engineering reasoning, and execution Presentation skills (20%) Slide clarity and oral presentation Validation (30%) Plan, completeness, and execution
Final Presentation	8%	Rubric: Technical merit (50%) Progress, skills, engineering reasoning, and execution Presentation skills (20%) Slide clarity and oral presentation Validation (30%) Plan, completeness, and execution
Participating in Engineering Project Showcase	Pass/Fail	Registration and participation in the Engineering Project Showcase held in April.
Demo	40%	Rubric: Technical merit (35%) Project complexity and engineering skills Team member participation (5%) Operation (30%) System operating as expected Validation (30%) Completeness and execution
Final Report	25%	Rubric: Written communication (15%) Usage of English, clarity, etc. Technical merit (50%) The complexity of the project and engineering skills Validation (35%) Completeness and execution
Ethics cases and quizzes	2%	Successful completion of all quizzes
GitHub repository and sponsor feedback	Pass/Fail	The repository will be checked periodically and at the end of the semester.

Grading Policy Notes:

- The individual contribution of each team member will be considered in determining their final course grade.

- Submit all written and oral assignments in **PDF format on Canvas before the deadline of your presentation time**.

  Your team will receive **ZERO CREDIT** for the presentation **if your slides are not on Canvas**.

  Submission of assignments is **every team member's responsibility** to ensure this occurs properly.

  Sponsors (both industry, faculty, and instructor sponsors) should receive copies of all presentations and reports at least three days before the due date to allow time to incorporate feedback.

- Full attendance (i.e., for the entire lab and lecture unless dismissed) is mandatory for all lectures and labs. University rules related to excused and unexcused absences are located online at https://student-rules.tamu.edu/rule07/.

  An unexcused LAB absence will lead to an F grade in this class.

- The class's presentation ("C") component needs a passing grade for the student to pass this class.

- For lab access, you will need to meet all PPE requirements; **safety glasses are required for lab access, and every student needs to purchase these.**

Attendance Policy

Full attendance (i.e., for the entire lab and lecture unless dismissed) is mandatory for all lectures, presentation updates, and labs. Please refer to Student Rule 7 in its entirety for information about excused absences, including definitions, related documentation, and timelines.

An unexcused LAB absence will lead to an F grade in this class.

Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7 or other reasons deemed appropriate by the instructor. Please refer to Student Rule 7 in its entirety for information about makeup work, including definitions and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate more than 30 days for makeup work, and the timeframe for makeup work should be agreed upon by the student and instructor" (Student Rule 7, Section 7.4.1).

"The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" (Student Rule 7, Section 7.4.2).
Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (See Student Rule 24.)

Textbook and Resource Materials

There is no required textbook for this class. Below are a few books for reference:

- Wiley Series in System Engineering and Management by Alexander Kossiakoff, Samuel Seymour
- Systems Design and Engineering: Facilitating Multidisciplinary Development Projects by Bonnema G. Maarten, Veenvliet T.
- Embedded System Design by Peter Marwedel
- Systems engineering Design Principles and models by Dahai Lu
- The Art of Electronics by Paul Horowitz and Winfield Hill
- IC Op-Amp Cookbook by Walter G. Jung
- Active Filter Cookbook by Don Lancaster
- The C++ Programming Language by Bjarne Stroustrup (the creator of C++)
- C by Dissection by Kelly Pohl
- Digital Image Processing by Rafael Gonzalez and Ricard Woods

Learning Management

Class information, EDC information, announcements, report/presentation examples, and the grade book will be found in the TAMU's learning management system, Canvas, at:

https://canvas.tamu.edu/
log in with your NetID/password

General FEDC Personal Protective Equipment Requirements

- **Long pants** – the pant leg opening must reach and completely cover the top opening of the shoe to prevent materials from entering. This includes military fatigues; fatigued pants must be fully pulled out of the boot, and the length of the full pants must be extended. Pants should have no holes, deformations, cuts, or rubouts that will show skin or underclothes.

- **Shirts** are defined as having complete circular sleeves that cover the shoulder and extend at least to the elbow. Examples include T-shirts, button-up oxfords, and polos. Shirts must not have holes or loose thread.

- **Closed shoes** – are defined as having a hard sole at least 1/4" thick. Shoes must cover all toes, including the sides, and must cover the top of the foot to the ankle from all sides. The heel must be completely enclosed. Shoes must be made of a substantial material that can withstand the impact of any falling materials.

- **Safety glasses** are defined as clear polycarbonate Z87.1-certified safety glasses that wrap around or have side shields. Flexible safety goggles are prohibited.

- **Welding Personal Protective Equipment (PPE)** – will be specified outside the welding area.

- **No Food or Drink of any kind is allowed in the FEDC.**

FEDC Fabrication Shop and Construction Area PPE Requirements

- General FEDC PPE

- No jewelry should be worn on your hands, face, head, or neck.

- Long hair must be tied and stowed under a collar.

- No Capri, yoga, 100% rayon, nylon, or polyester pants

- 100% Cotton jeans, khakis, or sturdy sweatpants

- Long-sleeve shirts are to be rolled up to the elbow.

- No cellphones or headphones in the fabrication shop unless prior approval is given for academic purposes only.

Academic Integrity Statement and Policy

"An Aggie does not lie, cheat or steal, or tolerate those who do."

"Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one's work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case" (Section 20.1.2.3, Student Rule 20).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at aggiehonor.tamu.edu.

Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources in the Student Services Building or call them at (979) 845-1637 or visit disability.tamu.edu. Disabilities may include but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability-related needs with Disability Resources and their instructors as soon as possible.

Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors influencing a student's academic success and overall well-being. Students are encouraged to engage in proper self-care by utilizing the resources and services available from Counseling & Psychological Services (CAPS). The TELUS Health Student Support app provides access to professional counseling in multiple languages anytime, anywhere, by phone or chat, and the 988 Suicide & Crisis Lifeline offers 24-hour emergency support at 988 or 988lifeline.org.

The university aims to give students essential knowledge and tools to understand and support mental health. As part of our commitment to your well-being, we offer access to Telus Health, a service available 24/7/365 via chat, phone, or webinar. Scan the QR code to download the app and explore the resources available for guidance and support whenever needed.

Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see University Rule 08.01.01.M1):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, you will be able to control how the Report is handled, including whether or not to pursue a formal investigation. The University's goal is to make sure you know the range of options available to you and ensure access to the resources you need.

Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with Counseling and Psychological Services (CAPS).

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's Title IX webpage.

Class Schedule, ECEN 404, Spring 2025

Week #	Starting Date	Lecture	Lab
1	Jan 13 Jan 15	Class Overview Bi-Weekly Status Update #1 (a)*	Lab policy review, TA assignment, and get subsystems back together.
2	Jan 20 Jan 22	Jan 20th (Mon): MLK – no lectures Bi-Weekly Status Update #1 (a)	Finalize subsystem details, demonstrate and discuss progress.
3	Jan 27	Bi-Weekly Status Update #1 (b)	Finalize subsystem details, demonstrate and discuss progress
4	Feb 3	Bi-Weekly Status Update #2 (a)	Begin integration, demonstrate, and discuss progress.
5	Feb 10	Bi-Weekly Status Update #2 (b)	Continue integration, demonstrate, and discuss progress.
6	Feb 17	Bi-Weekly Status Update #3 (a)	Continue integration, demonstrate, and discuss progress.
7	Feb 24	Bi-Weekly Status Update #3 (b)	Fix issues with the integrated system, demonstrate integration, and discuss.
8	Mar 3	Bi-Weekly Status Update #4 (a)	Fix issues with the integrated system, demonstrate integration, and discuss.
9	Mar 10	**Spring Break**	**Spring Break**
10	Mar 17	Bi-Weekly Status Update #4 (b)	Discuss and show system validation ** Blitz weekend.
11	Mar 24	Bi-Weekly Status Update #5 (a)	Discuss and show system validation.
12	Mar 31	Bi-Weekly Status Update #5 (b)	Discuss and show system validation.
13	Apr 7	**Final Design Presentation (a)**	Discuss and show system validation.
14	Apr 14	**Final Design Presentation (b)** April 14 (Mon): Q-drop deadline	**Trial system demonstration to T/A**
15	Apr 21	**no lectures**	**Final Project Demonstrations**
16	Apr 28	**Final Report (April 28th)**	

*Jan 15th

There won't be any lectures on Monday, January 20th (MLK). Because of this, all Monday "A" presentation teams will present their first presentation on Wednesday, January 15th.

**Design Blitz

A Capstone ECEN design Blitz will be scheduled from **Friday, March 21st through Sunday, March 23rd**. This blitz lets your team coordinate time with TAs and professors in blocks to ask questions and seek advice on your project and development issues. The blitz will be held at the FEDC.