SYLLABUS
ECE-4330/5330 Embedded Systems Design
UCCS, Fall 2023

Course Description: Introduction to embedded systems including real time fault-tolerant significance. Study the hardware and software techniques for designing embedded systems, including study of various embedded operating systems, embedded controllers, and digital signal processing hardware. Study existing embedded systems.

Instructor:		**Dr. Darshika G. Perera**
Contact Information:		Email : darshika.perera@uccs.edu; dperera@uccs.edu
		Office : ENGR-222
		Website : http://ece.uccs.edu/~dperera/
Class Time:		Mondays 8.00AM – 10.40AM
Class Rooms:		Osborne Center B-217 for lectures, ENGR-229 for labs
Office Hours:		Mondays 11.00AM – 12.00PM & Thursdays 12.00PM – 1.00PM
Required Course Lab Kit /Material		Students need to purchase the ESD Lab kit for this course from ECE Department. The lab kit costs $16.
Prerequisites:		ECE 3430, CS 1450, or consent of the instructor. Meets with ECE 5330.
Grading:	ECE4330	Labs (equally weighted): 65%* Participation (attendance) on final project: 5% Final Exam: 30% (mandatory to pass the course)**
	ECE5330	Labs (equally, weighted): 50%*
		Final Project: 20% (mandatory to pass the course)**
		Final Exam: 30% (mandatory to pass the course)**
Teaching Assistant		Miss. Shivani Sharma: ssharma7@uccs.edu

***Policy for Lab Demos and Lab Reports:**

1) All the lab demos and reports should be completed in a professional manner and on time.
2) Lab demos are due during the lab hours (on the day indicated in the course schedule below).
3) Lab reports will not be accepted, without completing the lab demos.
4) Any lab demos after the lab hours on Monday will not be accepted.
5) Any lab reports after the lab hours on Monday will not be accepted.
6) Must turn in a hard copy – (soft copy during the online/remote classes).

** Final exam (for both undergraduate/graduate students) and Project (for graduate students) are mandatory to pass the course. The students will be given an "incomplete grade" if any of these course requirements are not fulfilled.

Note: Check the Canvas regularly for announcements, updates, and new material.

Total marks are calculated as follows:

For Undergrads: = (0.65 * (hw 1 to 6) / 6) + (0.3 * final exam) + (0.05*participation on final project)

For Grads: = (0.5 * (hw 1 to 6) / 6) + (0.2 * final project) + (0.3 * final exam)

The grades are as follows:

A =94-100
A- =90-93
B+ =87-89
B =84-86
B- =80-83
C+ =77-79
C =74-76
C- =70-73
D+ =67-69
D =64-66
D- =60-63
F =below 60

Course Schedule

Note: This is a tentative schedule, subject to change.
Please do not make travel arrangements during the demos of the final project, and also during the final exam period.

Week	Date	Planned Activities	Due Before and During
1	08/21	Lecture 1: Overview of Embedded Systems, Introduction to ARM M0, & ARM Development Board (B-217)	
2	08/28	Lecture 2: Hints on Lab1a & Lab 1b Introduction to Embedded Systems & Go through Tutorial (ENGR-229)	
3	09/04	Labor Day holiday (no classes)	
4	09/11	Lecture 3: Hints on Lab 2 A/D Converter Complete Lab1: Introduction to Embedded Systems (ENGR- 229)	Before: Read reference manuals, user guides; Read lab 1 manual; complete pre-lab 1a & 1b questions
			During: Hand in pre-lab 1a & 1b, complete & demo lab 1a & 1b
5	09/18	Lecture 4: Hints on Lab 3 Optical Sensor Complete Lab 2: A/D Converter	Before: Read lab 2 manual; complete pre-lab 2 questions

		(ENGR- 229)	During: Hand in Lab 1 Report; hand in pre-lab 2; Complete & demo Lab 2
6	09/25	Work on Lab 3: Optical Sensor (ENGR-229)	Before: Read lab 3 manual; complete pre-lab 3 questions
			During: Hand in Lab 2 Report; hand in pre-lab 3; Demo Lab 3
7	10/02	Lecture 5: Hints on Lab 4 D/A Converter Complete Lab 3: Optical Sensor (ENGR-229)	
			During: Complete & demo Lab 3;
8	10/09	Lecture 6: Hints on Lab 5 Controls and Feedback (ENGR-29) Complete Lab 4: D/A Converter Graduate student proposal submission	Before: Read lab 4 manual; complete pre-lab 4 questions
			During: Hand in Lab 3 Report; hand in pre-lab 4; Complete & demo Lab 4 Proposal submission by graduate students
9	10/16	Work on Lab 5: Controls and Feedback (ENGR-229)	Before: Read lab 5 manual; complete pre-lab 5 questions
			During: Hand in Lab 4 Report; hand in pre-lab 5; Demo Lab 5
10	10/23	Lecture 7: Hints on Lab 6-7 Open/Closed Loop, Proportional Controller (ENGR-229) Complete Lab 5: Controls and Feedback	
			During: Complete & demo Lab 5
11	10/30	Work on Lab 6: Open/Closed Loop Controller (ENGR-229)	Before: Read lab 6-7 manual; complete pre-lab 6-7 questions
			During: Hand in Lab 5 Report; hand in pre-lab 6-7; Demo Lab 6
12	11/06	Work on Lab 7: Proportional Controller Complete Lab 6: Open/Closed Loop Controller (ENGR-229)	
			During: Complete & Demo Lab 6; Demo Lab 7
13	11/13	Complete Lab 7: Proportional Controller Work on Final Projects (ENGR-229)	
			During: Complete & Demo Lab 7
14	11/20	Thanksgiving holiday (no classes)	
15	11/27	Work on Final Projects (ENGR-229)	During: Hand in Lab 6-7 Report
16	12/04	Lecture: Final Exam Review Demo Final Projects (ENGR-229)	Demo Final Projects (ENGR-229)
17	12/11	Final Exam: Open lab report (B-217)	Before or During: Hand in Final Project Reports (graduate students)

Recording Policy:
Students are prohibited from making audio or video recording of any class activity conducted in person or online unless the student has provided the instructor with a Faculty Accommodation Letter from Disability Services. In such cases, the Faculty Accommodation Letter must be presented to the instructor prior to any recording done and recording should be reserved for that individual's educational use only. Students who are permitted to record are prohibited from distributing recordings without consent. Distribution without consent could be forwarded to the Dean of Students for consideration under the student code of conduct. Recording class activity without consent is a violation of instructor and student right to privacy, copyright, and intellectual property.

Academic Dishonesty:
http://www.uccs.edu/~dos/studentconduct/academicdishonesty.html defines plagiarism and cheating as:

Plagiarism is the use of distinctive ideas or words belonging to another person, without adequately acknowledging that person's contribution. Regardless of the means of appropriation, incorporating another's work into one's own requires adequate identification and acknowledgement, unless the material used is considered common knowledge. Plagiarism is doubly unethical because it deprives the true author of the rightful credit and gives that credit to someone who has not earned it. When the source is not noted, the following would constitute plagiarism:

- Word-for-word copying;
- The mosaic (to intersperse a few words of one's own here and there while, in essence, copying another's work);
- The paraphrase (the rewriting of another's work, but still using the same fundamental idea or theory);
- Fabrication (inventing or counterfeiting sources);
- Ghost-written material (submitting another's effort as one's own)

Cheating involves intentionally possessing, communicating, using (or attempting to use) unauthorized (by the instructor) materials, information, notes, study aids, or other devices, in any academic exercise, or the communication with any other person during such an exercise. Examples:

- Copying from another's paper or receiving unauthorized assistance from another during an academic exercise or in the submission of academic material.
- Using a calculator when the use has been specifically disallowed.
- Collaborating with another student or students during an academic exercise without the consent of the instructor.
- **Important – Students are not allowed to post: their own solutions online; instructor's solutions online; or other students solutions online.**

Bottom Line: You are not authorized to use another student's solutions to the homework, labs, or projects to create your solutions. You may discuss solutions but the final work must be your own. Academic Dishonesty will result in an F in the course.

Military Policy:
If you are a military student with the potential of being called to military service and/or training during the course of the semester, you are encouraged to contact your UCCS Course Instructor no later than the first week of class to discuss the class attendance policy. You are also strongly encouraged to schedule a one-on-one conversation with the Instructor so that special accommodations can be made.

Disability Services:
If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact and register with the Disability Services Office, and provide them with documentation of your disability, so they can determine what accommodations are appropriate for your situation. To avoid any delay in the receipt of accommodations, you should contact the Disability Services Office as soon as possible. Please note that accommodations are not retroactive, and that disability accommodations cannot provided until an accommodation letter has been given to Disability Services. Please contact Disability Services for more information about receiving accommodations at Main Hall room 105, 719-255-3354 or dservice@uccs.edu.

Testing Center:
The University Testing Center is available to all students; however, students with certified disabilities get first priority. The Testing Center requires 24-hrs advanced notice to schedule a testing time. Students are not always guaranteed the testing day and time of their choice and students without certified disabilities pay a testing fee.

Use of Laboratory Equipment:
Intentional misuse of laboratory equipment will not be tolerated and may result in criminal charges or other discipline.

During Fall 2021: (following requirements might have changed)
Mandatory Requirements due to COVID-19:
All students are expected to wear face coverings while inside all UCCS buildings/facilities. Guidance and exceptions to wearing a face covering can be read in the full executive order (https://vcaf.uccs.edu/sites/g/files/kjihxj1631/files/inline-files/COVID-19%20-%20Exec%20Directive%20APPROVED%20%288.17.2021%29.pdf). Students may be asked to leave the class if they are not wearing a face covering and additional disciplinary action may result in accordance with the Student Code of Conduct.

Before Fall 2021: (following requirements might have changed)
Additional Details/Requirements Due to COVID-19:
Classroom and Campus Etiquette:

- All students must take a self-health assessment regarding COVID 19 and symptoms (EVERY DAY) before coming to campus. You should carry evidence you have taken the quiz with you on campus.
- As you enter class, I may ask you to show me that you answered the questions on the self-health assessment as you enter the room.
- You are required to wear a face covering which covers your nose and mouth while on campus indoors at all times. This includes in the classroom. Wearing a face shield only is not sufficient for being in-class with faculty. Faculty may remove their face covering if at least 10 feet from students, but students are required to wear a face covering at all times. Students and faculty may wear both a face covering and a face shield when on campus.
- Face masks can't have holes in them. More information can be found here: https://covid19.uccs.edu/sites/g/files/kjihxj1366/files/inline-files/On-Campus_Face_Covering Requirements and Compliance (2).pdf
- Students who do not wear a face covering when entering buildings and classrooms will be asked to leave.
- You are required to stay six feet away from your classmates, and staff and faculty at all times.
- **Faculty have the right to cancel a class** if there are students who do not observe 1) Answering the questions on the safety quiz, 2) wearing a face mask over their nose and mouth, 3) keeping proper social distance, and students who are visibly sick

Group Work in the Classroom

- Periodically you will be asked to engage in small group discussion in the classroom. Even in small groups, we must continue to wear face coverings and maintain social distance guidelines. In class, using Microsoft Teams and Canvas Collaboration tools including chat, whiteboard, and shared documents can enhance small group interaction while maintaining public health guidelines.

What should I do if I am sick?

- The student health center on campus can give you a rapid COVID 19 test if you have the symptoms of COVID 19. It only takes 15 minutes to get your results!
- If you're sick, even with a cold, please stay home to avoid spreading your illness.
- Isolate yourself from others if you are sick and seek medical care

Attendance and Missing quizzes, exams and activities due to illness

- Attendance will be taken at all in-person classes. This is in order to do contact tracing if needed.
- You may be excused from one class activity (quiz or exam, etc.) during the semester if ill. Please don't come to campus sick, even if it's not with COVID 19. Please let me know the day of the quiz or exam (or faculty can decide what's appropriate) before it starts, and I will average the scores of your other exams and quizzes and replace that score.
- If you have a long-term illness, we will consider that on a case-by-case basis.