

University of Maine — ECE271: Microcomputer Architecture and Applications
Spring 2022

Instructor:

Vincent Weaver, Barrows 203, e-mail: vincent.weaver@maine.edu
Office Hours: 11:00am-12:00pm Monday and Wednesday, or e-mail to arrange

Teaching Assistant:

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Office Hours: TBA

Course Website:

http://web.eece.maine.edu/~vweaver/classes/ece271_2022s/

Lectures: Tuesday/Thursday 11:00am-12:15pm, Barrows 119

Labs: MoWeTh 2:00pm-4:50pm, Kepware Lab (Barrows 225)

Final Exam: Thursday 5 May 2022, 8:00am-10:00am, Barrows 119

Course Listing: The microcomputer and its component parts including microprocessors, registers, memory and I/O. Programming in C and Assembly and applying the microcomputer in engineering systems. Lec 4. (Spring.)

Pre-requisites:

ECE275 Sequential Logic Systems
This course involves C coding and ARM assembly language.

Textbook:

Embedded Systems: With ARM Cortex-M Microcontrollers in Assembly Language and C, Third Edition by Yifeng Zhu, 2017.

By the end of the course you will:

- Learn at a low level how computers work
- Understand basic memory addressing, endianness, and data alignment
- Understand Fixed-point arithmetic implementation
- Be able to program an STM32L board in C and Assembly language
- Understand low-level SoC hardware
- Understand and be able to program interrupts
- Be able to program low-level GPIO and other hardware devices.

Lab Policy

- Labs will be submitted electronically unless otherwise specified.
- All labs are due at the beginning of the next lab session you enrolled. Late submission and demonstration are penalized 20% for each late day, including weekends. Once solutions are published, late lab work cannot be accepted for credit. In addition, to accommodate unexpected events, you have a total of five “free” days of late demonstration and submission without penalty for all labs except the last one. You can use at most three days in the last lab assignment.
- In all lab assignments, student must work independently, not in a group team, unless it is specified as a group assignment in the lab document. If nothing is specified, you should assume that the lab should be completed independently, without any collaboration with any others.

Grading:

Class Participation / Quizzes – 5%

Prelim 1 – 10%

Prelim 2 – 15%

Final Exam – 20%

Labs – 50%

University of Maine Required Statements

Academic Honesty Statement

Academic honesty is very important. It is dishonest to cheat on exams, to copy term papers, to submit papers written by another person, to fake experimental results, or to copy or reword parts of books or articles into your own papers without appropriately citing the source. Students committing or aiding in any of these violations may be given failing grades for an assignment or for an entire course, at the discretion of the instructor. In addition to any academic action taken by an instructor, these violations are also subject to action under the University of Maine Student Conduct Code. The maximum possible sanction under the student conduct code is dismissal from the University. Please see the University of Maine System's Academic Integrity Policy listed in the Board Policy Manual as Policy 314: <https://www.maine.edu/board-of-trustees/policy-manual/section-314/>

Students with disabilities statement

If you have a disability for which you may be requesting an accommodation, please contact Student Accessibility Services, 121 East Annex, 581.2319, as early as possible in the term. Students who have already been approved for accommodations by SAS and have a current accommodation letter should meet with me (the instructor of the course) privately as soon as possible.

Course Schedule Disclaimer (Disruption Clause)

In the event of an extended disruption of normal classroom activities (due to COVID-19 or other long-term disruptions), the format for this course may be modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.

COVID-19

To keep our campus safe, students are expected to comply with all University policies related to the COVID-19 pandemic. For the latest guidance, please visit <https://umaine.edu/return> or <https://www.maine.edu/together/community-guidance/students/>

Observance of Religious Holidays/Events

The University of Maine recognizes that when students are observing significant religious holidays, some may be unable to attend classes or labs, study, take tests, or work on other assignments. If they provide adequate notice (at least one week and longer if at all possible), these students are allowed to make up course requirements as long as this effort does not create an unreasonable burden upon the instructor, department or University. At the discretion of the instructor, such coursework could be due before or after the examination or assignment. No adverse or prejudicial effects shall result to a student's grade for the examination, study, or course requirement on the day of religious observance. The student shall not be marked absent from the class due to observing a significant religious holiday. In the case of an internship or clinical, students should refer to the applicable policy in place by the employer or site.

Sexual Discrimination Reporting

The University of Maine is committed to making campus a safe place for students. Because of this commitment, if you tell a teacher about an experience of sexual assault, sexual harassment, stalking, relationship abuse (dating violence and domestic violence), sexual misconduct or any form of gender discrimination involving members of the campus, your teacher is required to report this information to Title IX Student Services or the Office of Equal Opportunity.

If you want to talk in confidence to someone about an experience of sexual discrimination, please contact these resources:

For confidential resources on campus: Counseling Center: 207-581-1392 or Cutler Health Center: at 207-581-4000.

For confidential resources off campus: Rape Response Services: 1-800-871-7741 or Partners for Peace: 1-800-863-9909.

Other resources: The resources listed below can offer support but may have to report the incident to others who can help:

For support services on campus: Title IX Student Services: 207-581-1406, Office of Community Standards: 207-581-1409, University of Maine Police: 207-581-4040 or 911. Or see the OSAPV website <https://umaine.edu/titleix/> for a complete list of services.