

**University of Maine — ECE571: Advanced Microprocessor-Based Design**  
Spring 2018

**Instructor:**

Vincent Weaver

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Office: Barrows 203

Office Hours: 12:00pm-1:00pm Tuesday and Thursday, or e-mail to arrange an appointment

**Course Website:**

[http://web.eece.maine.edu/~vweaver/classes/ece571\\_2018s/](http://web.eece.maine.edu/~vweaver/classes/ece571_2018s/)

**Course Schedule:**

Lectures: Tuesday/Thursday 3:30pm-4:45pm, Barrows 133

**Course Listing:**

Includes techniques for developing software and hardware for microprocessor-based systems, computer aided design using a multistation logic development system, use of components commonly found in microprocessor-based systems. Lec 2, Lab 3. (Spring.)

**Content this Semester**

We will investigate modern systems, with a focus on ARM and x86 processors. We will investigate various metrics for evaluating such systems, including performance, power, energy, and code density.

**Pre-requisites:**

ECE471 or permission

Ideally you have C programming and basic Linux knowledge.

**After this class you will be able to:**

- Know the features and limitations when measuring performance using Hardware Performance Counters
- Understand the various Energy and Power metrics used when analyzing modern computer systems
- Be able to conduct power and performance analysis using the Linux operating system.
- Know the power and performance implications of various architectural features, including Superscalar, Out-of-order, Hardware Multi-threading, Caches, and Branch Predictors.
- Know the power and performance implications of various pieces of hardware, including CPU, GPU, Memory, and Disks.
- Know the power and performance implications of the x86 and ARM architectures.

**Grading:**

Class Participation (5%)

11 homework assignments (5% each), Lowest is dropped

2 midterm exams, tentatively scheduled 22 March and 26 April (25% total)

1 final project (20%)

**Late Work:** Late work is penalized at 20% a day.

## 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.

### **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, 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.

### **Sexual Violence Policy and 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 the campus Office of Sexual Assault & Violence Prevention 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: 1-800-310-0000 or Spruce Run: 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: Office of Sexual Assault & Violence Prevention: 207-581-1406, Office of Community Standards: 207-581-1409, University of Maine Police: 207-581-4040 or 911.

Or see the OSAVP website for a complete list of services at <http://www.umaine.edu/osavp/>