

ECE 571 – Advanced Microprocessor-Based Design Lecture 1

Vince Weaver

`http://web.eece.maine.edu/~vweaver`

`vincent.weaver@maine.edu`

31 August 2020

Introduction

- Go over syllabus (from website)

http://web.eece.maine.edu/~vweaver/classes/ece571/ece571_2020f.pdf



Syllabus – Class Notes

- Lectures will be streamed and also recorded. In-person attendance is not mandatory, but if you are doing class asynch let me know just so I know what's going on.
- If you zoom in, feel free to turn off video and microphone if not asking question. Might be easier to just monitor the text chat for questions.
- Office hours, e-mail me. If need to talk can set up a Zoom meeting.



Syllabus – Gradings

- class participation (5%)
- 11 homeworks (5% each), one dropped
- 1 midterm exam (20% of total)
- 1 final project (25% of total)
last week of classes, zoom presentation?
- No final exam



Syllabus – Other

- Book – no book, but for the first half when we review computer architecture, Patterson and Hennesey optional readings are posted. Can “check out” for free from Umaine Library webpage.
- Boilerplate
- Covid stuff – keep distant, wear masks, wash hands, if you are feeling sick *please* don't come to class.



Advanced Microprocessor Based Design

- ***NOT*** a direct continuation of ECE471 (Embedded Systems) No blinking LEDs on embedded boards. More of a mix of 471 and 473 ideas.
- Power and Energy concerns on modern systems.
- Will involve some computer architecture. Don't worry if not a Computer Engineer, will try to review completely.
- Will involve reading some papers.
- Will involve logging into Linux boxes and running experiments.



Modern CPU Related Topics

- Modern CPUs (x86? Intel? AMD? ARM? RISC-V?)
- Memory (DDR4/DDR5?), NVRAM
- Disk (SSD)
- Graphics (GPUs)



Advanced Microprocessor Based Design

What is an Advanced Microprocessor?

- Desktop?
- Server?
- Supercomputer?
- Embedded?
- They are all converging.



Moore's Law

- Memory Wall
- Power Wall
- Tiny tiny transistors
- More and More Cores
- Something's Got To Give



What do people want out of a Microprocessor?

- Performance?
- How do you analyze performance?



What is Performance?

- Getting results as quickly as possible?
- Getting *correct* results as quickly as possible?
- What about Budget?
- What about Development Time?
- What about Hardware Usage?
- What about Power Consumption?
- What about Security?

