Class Syllabus: 2150 CoSc Spring 2020.

Instructor

- Prof. Philip Schlump
- Office: 4081B - Engineering Building (Right across from the CoSci Office)
- Contact via email (pschlump@uwyo.edu) or for emergencies only: 720-209-7888 (my cell) and pschlump@gmail.com (personal email - I check my UW email more often).
- Class M/W/F 8:00AM to 8:50AM - Attendance is required.

I prefer email for contact and setup of appointments. After hours appointments will usually be in the Coe Library - so plan on reserving a room.

If you want to call me to set up an appointment you, will need to send me a SMS message first so that I enter your name into my contact list. I get 20+ robo-calls a day and I will not answer a random number. Text me with your name and that you are a student in the 2150 class.

Required texts

Textbook: The Essentials of Computer Organization and Architecture, 5th edition, Linda Null & Julia Lobur. (3rd and 4th edition will work - you do not need the scratch off code in the book so a used book is fine).

Required

Both the two midterms and the final are required.

Final Examination is 8:00AM till 10:00AM May 15th 2020. Location to be determined.

Extra credit

No extra credit is planned at this time.

Office Hours

Immediately following class from 9:00 am till 11:00am, Mon, Wed, Fri.

Other times via an appointment. Generally I am unavailable on Tuesday and Thursday.

Grading

Your grade is from the 2 Midterms, Final and the Homework.

Title	Points
Homework 1 - Setup / Access MARIE - Price Computer	200 Pts
Homework 2 - Representation of Numbers / ASCII / Unicode	200 Pts
Homework 3 - Boolean Algebra - Gates / Error Correction	200 Pts
Homework 4 - MARIE 1st program	200 Pts
Homework 5 - MARIE assembly language programs	200 Pts
Homework 6 - Implement MARIE Emulator	200 Pts
Homework 7 - Multiply/Divide Subroutine in MARIE	200 Pts
Homework 8 - Microcode Part 1	200 Pts
Homework 9 - Microcode Part 2	200 Pts
Homework 10 - Compiled Code / Paper (1-2 page)	200 Pts
Midterm - 1	300 Pts
Midterm - 2	300 Pts
Final	400 Pts

Total: 3000

Homework is 66% - tests are 33% of the grade. This means that you MUST do a significant portion of the homework or you will not pass the class.

Points	Letter Grade
From 2600 to 3000	A
From 2300 to 2600	B
From 2000 to 2300	C
From 1700 to 2000	D
From 0 to 1700	F

Overview

This is an approximate schedule. Updates will be noted in class.

Date	No	Description
Mon Jan 27, 2020	01	Introduction to class
		Cover Syllabus - Syllabus revisions - Office Hours - Class Policy
		My background
Wed Jan 29, 2020	02	Layers of Representation in Systems
Fri Jan 31, 2020	03	What is knowing machine architecture good for?
		Homework 1 Due / Setup / Access MARIE etc.
Mon Feb 03, 2020	04	Base Conversion / Octal / Decimal / Hex / Base37 / Base64 etc.
		Finish reading Chapter 1 & 2 by this date
Wed Feb 05, 2020	05	Signed Numbers / Character Codes
Fri Feb 07, 2020	06	Error Correction Codes
		Homework 2 Due / Representation of Numbers / ASCII / Unicode
Mon Feb 10, 2020	07	Gates and Boolean Logic
		Finish reading Chapter 3 by this date
Wed Feb 12, 2020	08	More on Gates and Logic
Fri Feb 14, 2020	09	FPGA's / ASIC's and VLSI design
		Homework 3 Due / Boolean Algebra / Gates
Mon Feb 17, 2020	10	MARIE system - How an instruction gets run
Wed Feb 19, 2020	11	Components of MARIE
Fri Feb 21, 2020	12	More on MARIE and instructions
		Homework 4 Due / 1st MARIE assembly language programs
Mon Feb 24, 2020	13	Fancier Assembly Language Architectures
		Finish reading Chapter 4 by this date
Wed Feb 26, 2020	14	Midterm Review
Fri Feb 28, 2020	15	Midterm 1
Mon Mar 02, 2020	16	Instruction Types

Date	No	Description
		Finish reading Chapter 5 by this date
Wed Mar 04, 2020	17	Pointers in C / C++ / MARIE
		Homework 5 Due / MARIE assembly language programs
Fri Mar 06, 2020	18	Call Return Processing
Mon Mar 09, 2020	19	Microcode Implementations of Hardware
Wed Mar 11, 2020	20	Microcode Part 2
		Read paper on microcoded architecture
Fri Mar 13, 2020	21	Instruction Decode for Microcode (Memory Decode / Hard-Wired)
Mon Mar 16, 2020		*spring break - no class*
Wed Mar 18, 2020		*spring break - no class*
Fri Mar 20, 2020		*spring break - no class*
Mon Mar 23, 2020	22	Pointers / Safe Pointers / Buffer Overrun
		Homework 6 Due / MARIE Emulator
		Finish reading Chapter 6 by this date
Wed Mar 25, 2020	23	System Software / Performance Tuning / Quantum Computing
Fri Mar 27, 2020	24	NUMA - Cache Persistence - Timing Attacks / Specter
Mon Mar 30, 2020	25	Virtual Memory - Memory Controllers - Programs larger than memory
		Homework 7 Due / Multiply / Divide
		Finish reading Chapter 7 (some sections) by this date
		Only: 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.10.
Wed Apr 01, 2020	26	Midterm Review
Fri Apr 03, 2020	27	Midterm 2
Mon Apr 06, 2020	28	Microcode Demo - Logic Analyzer
		Finish reading (do not study) Chapter 8 and 9 by this date
Wed Apr 08, 2020	29	Programming in Logic - Why Microcode - Verlog - FPGAs/ASICs
Fri Apr 10, 2020	30	More on Microcode Architecture - Intel ME / OS
		Homework 8 Due - Project - Part 1 - Microcode Machine - Hardware

Date	No	Description
Mon Apr 13, 2020	31	Stack Machines - 256Bit - Ethereum
Wed Apr 15, 2020	32	GPUs - high parallel computation
Fri Apr 17, 2020	33	Tiny Processors - IoT - Adrino etc.
Mon Apr 20, 2020	34	Growth of Processing / Linux as an OS / VxWorks (Pathfinder)
Wed Apr 22, 2020	35	Emulating Hardware (IBM OS 360 and 370, VM Host, VM-Ware, Docker)
Fri Apr 24, 2020	36	Emulating Handheld Devices (iOS / Android)
		Homework 9 Due - Project - Part 2 - Microcode Machine - Microcode
Mon Apr 27, 2020	37	To Be Determined (TBD)
Wed Apr 29, 2020	38	TBD
Fri May 01, 2020	39	TBD
		Homework 10 Due - Compiled Program run on your microcode machine
Mon May 04, 2020	40	TBD
Wed May 06, 2020	41	TBD
Fri May 08, 2020	42	Final Review

Final Exam

Final Examination is 8:00AM till 10:00AM May 15th 2020. Location to be determined.

Late work.

Work turned in late will loose 10% per calendar day. Nothing may be turned in after the last day of class.

Title IX – Duty to Report

The University of Wyoming faculty are committed to helping create a safe learning environment for all students and for the university as a whole. If you have experienced any form of gender or sex-based discrimination or harassment, including sexual assault, sexual harassment, relationship violence, or stalking, know that help and support are available. The University has staff members trained to support survivors in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, and more. The University strongly encourages all students to report any such incidents to the University. Please be aware that all University of Wyoming employees, including student staff, are required to report all Title IX related concerns to the Title IX Coordinator or their supervisor. This means that if you tell a faculty member about a situation of sexual harassment or sexual violence, or other related misconduct, the faculty member must share that information with the University's Title IX Coordinator. UW's Title IX Coordinator is Jim Osborn (Manager of Investigations, Equal Opportunity Report and Response). He is located in Room 320 of the Bureau of Mines Building, and can be reached via email at report-it@uwyo.edu or via phone at 766-5200 or 766-5228. For more information, go to: http://www.uwyo.edu/reportit/learn-more/faqs.html .

Attendance and Absence policies

Attendance is critical. There is no text book for ALL of the material. The only way to know what you need to know is by attending class. If you have an excused absence that is fine, try to get notes from the day you missed from one of your classmates. Just don't skip!

Classroom Behavior Policy

At all times, treat your presence in the classroom and your enrollment in this course as you would a job. Act professionally, arrive on time, pay attention, complete your work in a timely and professional manner. You will be respectful towards your classmates and instructor. Spirited debate and disagreement are to be expected in any classroom and all views will be heard fully, but at all times we will behave civilly and with respect towards one another. Personal attacks, offensive language,

name-calling, and dismissive gestures are not warranted in a learning atmosphere. As the instructor, I have the right to dismiss you from the classroom.

Classroom Statement on Diversity

The University of Wyoming values an educational environment that is diverse, equitable, and inclusive. The diversity that students and faculty bring to class, including age, country of origin, culture, disability, economic class, ethnicity, gender identity, immigration status, linguistic, political affiliation, race, religion, sexual orientation, veteran status, worldview, and other social and cultural diversity is valued, respected, and considered a resource for learning.

Disability Support

If you have a physical, learning, sensory or psychological disability and require accommodations, please register as soon as possible and provide documentation of your disability to Disability Support Services (DSS), Room 109 Knight Hall. You may also contact DSS at (307) 766-3073 or udss@uwyo.edu. Visit their website for more information: www.uwyo.edu/udss

Academic Dishonesty Policies

Don’t cheat on the exams. I expect you to take full advantage of all the online resources you can get your hands on. That includes Stack Overflow, Github etc. If you do use someone else’s code, put in a link to where you found it. Don’t cheat on the projects - do you own work. Most of the learning in the class is from *doing* the projects.

Substantive changes to syllabus

All deadlines, requirements, and course structure are subject to change if deemed necessary by the instructor. Students will be notified verbally in class, on our WyoCourses page announcement, and via email of these changes. I do travel during the semester. Class could be canceled or assignments due dates changed.

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