Course ID/Name: Comp 530/880 - Machine and Network Architecture (rev 8/27/24)

Semester: Fall 2024

Instructor: Michael Jonas (**office:** Zoom, **email:** mcy59@unh.edu)

Time and Location: Tuesday, 5:30 – 8:30pm, room 142 in Pandora

Office Hours: by appointment

Web Presence:

Canvas: mycourses.unh.edu

Website: http://stem.unh.edu/mcy59/comp/530

Twitter: unhm_prof_jonas

Course Description:

Examines the following topics. Machine organization: program and data representation; registers, instructions, and addressing modes; assemblers and linkers. Impact of hardware on software and software on hardware. Introduces the Internet protocol suite and network tools and programming and discusses various networking technologies. 4 cr.

Learning Objectives:

Upon completion of this course, students should be able to:

- Thorough understanding of modern operating system, their structure, and their use
- Install, configure and maintain a Linux distribution
- Communicate timely and work in teams effectively
- Argue for the use of open-source software tools and adoption of open source collaboration practices

Reading Material:

Material will be derived from lectures and from time to time there will be online resources pointed to. There is no textbook for this class.

Software Tools:

Access to basic text editor and a browser will be of primary need. If a particular software package is used (i.e. a programming language or a system emulator) a link for a free download will be provided.

Student Work and Class Pedagogies:

Lectures will generally take the form of board presentation with questions and answers. The course is 4 credits for undergraduates and the expectation is a minimum of 3 hours engaged time per week per credit over 16-week semester.

Lab Work:

For labs, students will be given a problem to solve individually. Most of the lab work will also translate to further homework assignments where student can show individually what they have learned within the collaborative setting of the lab.

Assignments:

A total of 7 assignments are given during the semester. Each assignment will either build on the previous set of assignments or be independent of it depending on what part of the course it covers. All assignments **are expected to be done individually** unless otherwise stated.

Schedule:

Class Date	***Class Topics***	***Class Activity***	***Assignments Due***
Aug 27	First contact, course overview, base conversion		
Sep 3	History of operating systems, binary math, 2's compliment, boolean logic	Lab1	
Sep 10	More boolean logic and building with logic gates	Lab2	
Sep 17	Fetch-Execute cycle: building our own machine code	Lab3	Hw1
Sep 24	Fetch Execute cycle: structure of machine, a microcode interpreter	Lab4	
Oct 3	Introduction to Assembly	Lab5	Hw2
Oct 8	Building an Assembler: indirect addressing and bit shifting for bytes	Review/Lab6	
Oct 15	*No classes, follow Monday schedule*		
Oct 22	Operating System Kernel: process manager	**Exam 1**	Hw3
Oct 29	Operating System Kernel: memory manager	Lab 7	
Nov 5	Operating System Kernel: device & file manager	Lab8	Hw4
Nov 12	Unix: file hierarchy, commands, & piping	Lab9	
Nov 19	Unix: regular expressions & shell scripting	Lab10	Hw5
Nov 26	Unix: more shell scripting	Lab11	
Dec 3	Unix: introduction to Perl	Lab12	Hw6
Dec 17	Unix: more Perl	**Exam 2**	
			Hw7 (Dec 20)

Grading:

15% Participation[1]

This includes attendance, participation, and preparedness

20% Lab work[2]

Lab assignments done during lab: 10 out of 12 at 2 points each

35% Homework[3]

You will have 7 homework assignments at 5 points each

30% Exams[4]

You will have 2 exams worth 15 points each

Policies:

Academic Honesty and Collaboration:

Collaboration is encouraged and supported in the classroom through lab activities and outside the classroom as directed by instructor. Note that homework assignments and tests you submit **must be entirely your own work.** Deviation from this policy will result in dismissal from the course.

See the University policy on **Academic Honesty** for more information.

Attendance:

Is mandatory and you will lose on class participation grade for unexcused absences. Since work is based off lecture and class activities it becomes difficult to do well with too many absences.

Late Assignments and Make-Up Exams:

Policies for late assignments and make-up exams are very strict and apply only in exceptional cases of student illness, accident, or emergencies that are properly documented. It is your responsibility to make arrangements with instructor before the deadline as soon as you are aware you will miss a deadline, exam or class. Unexcused late assignments are penalized 20% per day.

Use of Electronic Devices in Classroom:

Not allowed during examinations. Absolutely no cell phone use during class time.

Accessibility Services:

The University is committed to providing students with documented disabilities equal access to all university programs and facilities. If you think you have a disability requiring accommodations, you must register with Student Accessibility Services (SAS) office. The Student Accessibility Coordinator at UNHM is Jenessa Zurek (email jenessa.zurek@unh.edu).

Mental Health and Wellness

In partnership with The Mental Health Center of Greater Manchester, UNH Manchester offers free mental health sessions for students. For scheduling a session email unhm.advising@unh.edu.

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[1] COMP 880 will have preparedness, attendance, and participation worth 12%

[2] COMP 880 will have 12 labs at 2 points worth 24%

[3] COMP 880 will have 7 assignments at 2 points (not graded on correctness) worth 14%

[4] COMP 880 will have 2 exams at 25 points each worth 50%