

CS 3443: Computer Systems

Course Credit: 3.00

Instructor: Manaswini Pradhan, PhD

Class Schedule: 02:30pm-03:45am Monday/Wednesday (Classroom Building, Room 219)

Office hours. Monday/Wednesday 10.30am-11:30am or by appointment (MSCS 224)

Course home page: **Canvas**

Prerequisite(s): 2133.

Overview

Functional and register level description of computer systems, computer structures, addressing techniques, macros, linkage, input-output operations. Introduction to the processing operations and auxiliary storage devices. Programming assignments are implemented in MIPS assembly language.

Readings

Background on most topics covered in this course is easily found on the web; useful resources on particular topics are mentioned in class. However, I will utilize the following books as text and reference books:

Text book:

- David Patterson and John Hennessy "*Computer Organization and Design: The Hardware/Software Interface*", 5th edition, Morgan Kauffman Publisher, 2013. ISBN: 978-0-12-407726-3.

You will also be expected to work through several online tutorials and related readings.

Course Outline: Chapters 1-5 of the text book will be covered

1. Computer Abstractions and Technology
2. Instructions: Language of the Computer
3. Arithmetic for Computers
4. The Processor
5. Memory Hierarchy

Course Objectives

Upon completion of this course, students will demonstrate ability to:

- Demonstrate programming proficiency using various addressing modes and data transfer instruction of the target computers.
- Program using the capabilities of the stack, program counter and status register and show how these are used to execute a machine code program.
- Understand various conventional computational organizations and their strengths and weaknesses.
- Describe how a CPU performs instructions during fetch-decode-execute cycle and how memory supports its actions.
- Design of applications involving controllers and data paths.
- Understand I/O interface, memory interfaces.
- Understand interrupts and how can they be handled.
- Analyze and evaluate computer performance.

Course Grading Requirements

Subject to minor change:

Grading Criteria

Assignments	40% (40 points)
Attendance	10% (10 points)
Mid Term Exams	20% (20 points)
Final Exam	30% (30 points)
Total	100% (100 points)

Grading Scale

90% -- 100%	A
80% -- 89.99%	B
70% -- 79.99%	C
60% -- 69.99%	D
Less than 60%	F

Note: The total grades shown in Canvas may NOT reflect the proportions above. So, do your own calculation for grades using the proportions.

Assignments:

Assignments can be homework problems or programming assignments.

Assignments turned after a week late from the due date will not be accepted.

Homework assignments will not be accepted after the due date and time.

Programming assignments will be penalized at the rate of 10% per calendar day.

Assignment Submissions rules and practices:

- 1) All home assignments will be submitted **ONLY** through Canvas.
- 2) When naming your home assignments, you **MUST** use the naming convention below:
 - a. All files should be collected under one folder and zipped, before submitting.
 - b. The folder should be named as: Assignment**_LastName_FirstName_XX. (**where ** means assignment number and XX means question number**)Example: Assignment01_Andrew_Simon_03

Failure to submit in this order will automatically results in 5 % deduction.

- 3) You are encouraged to review the assignments when assigned (even if you don't have time to work on them right then). This way you can plan out your week and get your questions answered early. Please note that **not all assignments will be of same complexity.**
- 4) Any extra effort (in terms of introducing new ideas or concepts, detailed implementation and so on) will be encouraged and may be rewarded with extra bonus points.

Attendance

Attendance is very important for this class. Late arrival is not encouraged. Students are responsible for knowing all the **verbal (announcement)** and written information provided by the instructor during class, including those are posted on the course web page.

Course and Class regulations

If you are having trouble understanding a concept, please contact me inside the class or in my office during office hours. Please feel free to make constructive suggestions at any time including making comments anonymously.

I encourage, and reward, individual efforts to build a community of active learners. Participation in class will be highly encouraged.

- Deadlines are final and must be met. It is your responsibility to allocate time accordingly. Absolutely **NO** excuses will be accepted like computer crashes. Ensure that you have enough backups to allow for the worst-case scenarios, such as loss of your homework or project.
- Exams: No make-up exams will be given unless an acceptable University-approved excuse is provided promptly. Exams will be closed books and closed notes. Calculators that can store texts and diagrams will not be allowed during examination.

- Collaboration is allowed only in terms of concepts, ideas or techniques. However, each student needs to have their own implementation, write-ups and approach. Any violation of academic integrity would result in a zero grade and a report to the university administration. Major violation will result in a grade F.
- Please adhere to professional behavior in class. Refrain from side conversations, surfing the internet on personal devices, answering phones/ texting, etc.
- Students with disabilities who may require reasonable accommodations should contact Office of Disabled Student Service, 326 Student Union. Please advise the instructor of such disability and the desired accommodation at some point before, during or immediately after the first scheduled class period.

Advice for performing well in this class

- Attend the class regularly and turn in the weekly assignments well in time.
- Keep up with the weekly assignments, since many of the concepts build upon each other.
- Review the assignments when assigned (even if you don't have time to work on them right then). This way you can plan out your week and get your questions answered early. Do not wait until the last minute to work on an assignment at home.
- Turn in the assignments well in time.
- Manage the time especially at the mid-term examination and end of the semester with the final examination.

OSU Academic Integrity Policy:

OSU is committed to maintaining the highest standards of integrity and ethical conduct. This level of ethical behavior and integrity will be maintained in this course. Participating in a behavior that violates academic integrity (e.g., unauthorized collaboration, plagiarism, multiple submissions, cheating on examinations, fabricating information, helping another person cheat, unauthorized advance access to examinations, altering or destroying the work of others, and altering academic records) will result in an official academic sanction. Violations may subject you to disciplinary action including the following: receiving a failing grade on an assignment, examination or course, receiving a notation of a violation of academic integrity on your transcript, and being suspended from the University. You have the right to appeal the charge. Go to <http://academicintegrity.okstate.edu/> for a video on OSU's academic integrity policy and additional information.

Tentative Course Schedule:

Class	Date	Topics	Chapter
1	08/19	Computer Abstraction and Technology	1
2	08/21	Computer Abstraction and Technology	1
3	08/26	Computer Abstraction and Technology	2
4	08/28	Instruction: Language of the Computer	2
	09/02	University holiday, offices closed	
5	09/04	Instruction: Language of the Computer	2
6	09/09	Instruction: Language of the Computer	2
7	09/11	Instruction: Language of the Computer	2
8	09/16	Instruction: Language of the Computer	2
9	09/18	Instruction: Language of the Computer	2
10	09/23	Instruction: Language of the Computer	2
11	09/25	Instruction: Language of the Computer	2
12	09/30	Instruction: Language of the Computer	2
13	10/02	Arithmetic for Computers	3
14	10/07	Arithmetic for Computers	3
15	10/09	Arithmetic for Computers	3
16	10/14	Arithmetic for Computers	3
17	10/16	Arithmetic for Computers	3
18	10/21	Arithmetic for Computers	3
19	10/23	Mid Term Examination	
20	10/28	The Processor	4
21	10/30	The Processor	4
22	11/04	The Processor	4
23	11/06	The Processor	4
24	11/11	The Processor	4
25	11/13	Large and Fast: Exploiting Memory Hierarchy	5
26	11/18	Large and Fast: Exploiting Memory Hierarchy	5
27	11/20	Large and Fast: Exploiting Memory Hierarchy	5
28	11/25	Large and Fast: Exploiting Memory Hierarchy	5
	11/27	THANKSGIVING BREAK, CLASSES RECESSED	
29	12/02	Large and Fast: Exploiting Memory Hierarchy	5
30	12/04	Review	
	12/09	Final Exam	
<ul style="list-style-type: none"> • This is just a tentative course schedule. It may evolve throughout the semester. • MIPS Assembly language programming will be learned along the course. • If time permits, storage and other Peripherals (from chapter 6) will be covered. 			