Pennsylvania State University
School of Electrical and Computer Science
CMPEN 331 Computer Organization and Design
Summer 2020

Instructor:
Dr. Mohamed Almekkawy
Office: w105 Westgate Building
Email: Please Contact me through **"Canvas email"**, ***I will not respond to emails sent to my PSU email.***
Office hours: Tuesday: 1:30 – 2:30 pm,
https://psu.zoom.us/j/98213241665?pwd=OCtuZklNK1R4S2cyVjBVUXdxcVRvUT09
Meeting password: 331

Graders/Learning Assistants

- **Aishwarya Mallampati**
  Email: abm6404@psu.edu
  Office hours: (https://psu.zoom.us/j/3927508361)
  Monday and Thursday: 10:00-11:30 AM
  Wednesday and Friday: 5:00-6:30 PM

- **Muayyad Safri:**
  Email: mas7569@psu.edu
  Office hours: (https://psu.zoom.us/j/9673242118)
  Monday and Wednesday 12 PM – 1:30 PM
  Tuesday and Thursday: 5:00 – 6:30 PM

Class Meetings:
Lecture slides and videos will be available online in the following folder:
https://psu.box.com/s/wgvisuemgqg338p2e3ibvlrm9411rgpo

Prerequisite:
- CMPEN 270 or CMPEN 271
- CMPSC 121 or CMPSC 201

Textbook:
Required:

- Patterson, David A. and Hennessy, John L. Computer Organization and Design. 5th edition. (**Do not buy the normal hard copy**)
- Frank Vahid, Roman Lysecky Introduction Computer Systems and Assembly Programming (**Do not buy the normal hard copy)**

To subscribe for Computer Organization and Design text book, it costs $72

1- Sign in or create an account at learn.zybooks.com
2- Enter zyBook code " PSUCMPEN331AlmekkawySummer2020"
3- Subscribe by your section number

To subscribe for Introduction Computer Systems and Assembly Programming, it costs $25

1- Sign in or create an account at learn.zybooks.com
2- Enter zyBook code " PSUCMPEN3312Almekkawy Summer2020"
3- Subscribe by your section number

- ***For a prompt response regarding any issue relates to the zyBook, I encourage you to email "support@zybooks.com".***

References:

1. Andrew Tanenbaum and Todd Austin. Structured Computer Organization, 6th edition, Pearson
2. Linda Null and Julia Lobur. The Essentials of Computer Organization and Architecture, 4th edition, Jones & Bartlett Learning.
3. William Stallings, Computer Organization and Architecture, 10th edition, Pearson
4. Carl Hamacher, Zvonko Vranesic, Safwat Zaky, Naraig Manjikian. Computer Organization and Embedded Systems, 6th edition, Mc Graw Hill
5. Kip Irvine, Assembly Language for Intel-Based Computers, Prentice Hall.

Software Tools

- MARS, Xilinx Vivado.
- For the assembly language, you will need an environment in which you can edit, assemble, link and run assembly-language programs. We will use a Freeware simulator called MARS to support the required assembly language programming. This software is available for download from the following link, MARS itself has a nice Help feature. "http://courses.missouristate.edu/KenVollmar/MARS/".
- For the Verilog language, you will need to use Xilinx Vivado/ModelSim. This is available in w205 Westgate building. You can also download Vivado (**It is available for windows machine and it is not available for Mac**). Instructions for downloading the Vivado WebPack version can be found here: "https://psu.zoom.us/rec/play/7JJ-Ie39qW83SILHtQSDVvMoW9W8f_ms0iAZ-fBbyknjWnYHNFX0MLITYreG-lGwOix7t1ARDM0t1RlH?continueMode=true&_x_zm_rtaid=JHj-MawmRnKJnxZwHy45pw.1589756597472.4451f32987f26725060e6018c222b84e&_x_zm_rhtaid=474"

- **Course Goals and Objectives:**

Critical thinking, problem solving and information literacy: Students will use critical thinking and problem solving skills in analyzing information gathered through different media and from a variety of sources.

By the end of the semester, successful student will be expected to Identify/Recognize:

- Digital Logic Circuits and how data is represented
- Computer organization
- Assembler directives and the Instruction set
- How to write small programs in assembly language and translate them to machine code
- Combine basic digital circuitry components to process subsets of machine code
- MIPS and data path with pipeline implementation
- Verilog test bench and familiarity with Zynq 7000 Development Board
- Memory Hierarchy
- Storage and I/O devices

Required Work

Homework
Problems will be assigned weekly or biweekly. **Late homework will not receive any credit** without an official excuse. You have to solve the problems online in the zyBooks website. Some of the problems will be assigned in advance on explaining the corresponding materials.

Exams
There will be **two** midterm exams. No makeup exams will be given unless there are extra ordinary circumstances, such as a significant illness, family emergency. Please notify the instructor **BEFORE** a missed exam. In addition, submit written or printed documentation of the reason for your absence. Cheating on any (exam or quiz) will result in a 0 grade on that exam/quiz.

Quizzes
There are four pre-announced quizzes that will be given during the semester. Every student will have two, in advance, excuses to use them for skipping any two quizzes if needed (these can be personal or official excuses). Meaning that, I will **drop** the lowest two scores. (**no makeups,** unless you have more than two official excuses), **I will not respond to any email that requesting a makeup quiz unless it satisfies the aforementioned policy**. Review questions will be posted before each quiz.

Labs
Labs will be assigned weekly or biweekly. 5% deduction for each day of late submission for a maximum of 5 days (one minute will be counted as one day). No submission will be accepted after the 5th day of the due date.

Project
There will be one project. This project due date will be posted online, late submission will not be accepted. We might decide to discuss the project through video meeting with each student to assign the final grade of the project.

Grading:
Homework: 10%
Labs: 30%
Quizzes: 20%
Exam 1: 15%
Exam 2: 15%
Project: 10 %

Grading Distribution:

A 100-94	B+ < 90 - 86	C+ < 77 - 73	D < 68 - 61
A- <94- 90	B < 86 - 81	C < 73 - 68	F < 61 - 0
	B- < 81-77		

Students with Disabilities
It is my policy (as well as University policy) to provide, a flexible and individualized basis, reasonable accommodations to students who have disabilities that may affect their participation in this course. Penn State welcomes students with disabilities into the University's educational programs. Every Penn State campus has an office for students with disabilities. The Student Disability Resources Web site provides contact information for every Penn State campus. For further information, please visit the Student Disability Resources Web site.
In order to receive consideration for reasonable accommodations, you must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation. If the documentation supports your request for reasonable

accommodations, your campus's disability services office will provide you with an accommodation letter. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. You must follow this process for every semester that you request accommodations.

Counseling & Psychological Services (CAPS) Statement
Students who experience personal issues that interfere with their academic performance, social development or satisfaction at Penn State are encouraged to seek confidential assistance from Counseling and Psychological Services (CAPS) Center (http://studentaffairs.psu.edu/counseling/). They can be reached at (814) 863-0395. Some of the more common concerns they can help with include anxiety, depression, difficulties in relationships (friends, roommates, or family); sexual identity; lack of motivation or difficulty relaxing, concentrating or studying; eating disorders; sexual assault and sexual abuse recovery; and uncertainties about personal values and beliefs. Crisis intervention is available from Centre County CAN HELP (http://centrecountypa.gov/index.aspx?NID=593) at 1-800-643-5432, 24 hours a day, seven days a week.

Academic Integrity and Honesty
I expect you to abide by the standards of academic honesty set in the student guide. The University defines academic integrity as the pursuit of scholarly activity in an open, honest and responsible manner. All students should act with personal integrity, respect other students' dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts (refer to Senate Policy 49-20. Dishonesty of any kind will not be tolerated in this course. Dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. Students who are found to be dishonest will receive academic sanctions and will be reported to the University's Office of Student Conduct for possible further disciplinary sanctions (refer to Senate Policy G-9). Check http://www.eecs.psu.edu/students/resources/EECS-CSE-Academic-Integrity.aspx for additional details.

Course Policies
"This course may require you to take exams using certain proctoring software that uses your computer's webcam or other technology to monitor and/or record your activity during exams. The proctoring software may be listening to you, monitoring your computer screen, viewing you and your surroundings, recording and storing any and all activity (including visual and audio recordings) during the proctoring process. By enrolling in this course, you consent to the use of the proctoring software selected by your instructor, including but not limited to any audio and/or visual monitoring which may be recorded. Please contact your instructor with any questions."

Changes in syllabus and assignment sheets may be modified. All changes will be announced in class/online.