CoSc 425 **Computer Organization** Spring, 2024

Syllabus

Instructor

Stan Warford
Email: Stan.Warford@Pepperdine.edu

Office: RAC 112
Phone : 310-506-4332 (on campus, x4332)

Office hours

Monday, 11:00 – 11:50
Thursday 1:00 – 1:50
And by appointment

Tuesday, 9:00 – 9:50
Friday, 11:00 – 11:50

Course Web page

The course Web page will be used to post the assignments and late-breaking announcements. You are responsible for checking it regularly.
https://www.cslab.pepperdine.edu/warford/cosc425/

Objective

The goal of this course is for you to learn the hardware organization of typical von Neumann machines. As in all aspects of computer science, the field of computer organization consists of a body of principles and a myriad of implementations in the commercial and research worlds. Rather than emphasize actual machines, this course will emphasize first principles and only occasionally point out how they are manifest in various machines. We emphasize first principles as a strategy to minimize obsolete knowledge. Hardware technology is probably the fastest changing aspect of computer science. To focus primarily on one or two specific machines is to invite irrelevance as that machine progresses beyond recognition and eventually becomes obsolete. The commercial architectures that we will examine briefly are the Intel x-86 series as an example of a CISC organization, and the MIPS computer as an example of a RISC organization.

This course continues the theme of levels of abstraction begun in CoSc 330. That course presents the Pep/9 computer at the machine level, and its associated assembly language at the assembly level. This course takes us down to the lowest level of digital logic gates. We will have occasional laboratory exercises to get hands-on experience in wiring digital circuits. We will see how the gate level is related to the machine level, and learn how the microprogramming level, which lies between the gate level and the machine level, connects these two levels.

Learning outcomes

The program learning outcomes (PLO) for the computer science/mathematics major are the ability to:

1. Implement algorithms
2. Prove computational theorems
3. Analyze computational systems
4. Communicate technical results

The course student learning outcomes (SLO) for CoSc 330, Computer Systems are the ability to:

Implement a microprogram algorithm. (PLO 1)
Analyze and design a combinational digital circuit. (PLO 3)
Analyze and design a sequential digital circuit. (PLO 3)
Analyze the space time tradeoff in a central processing unit. (PLO 3)

Required text
J. Stanley Warford, *Computer Systems*, Fifth edition, Jones and Bartlett Publishers, 2017.

Text rebate
As the author of our text, if you purchase it new I will personally refund on your request 15% of the retail price you paid.

Final grade
12% Lab
12% Homework
44% Tests (22% each test)
32% Final - cumulative

Class schedule
The course web page has the schedule for the homework assignments, which are due twice weekly, and the lab schedule. The exam schedule is as follows:

Test 1, Monday, February 12
Test 2, Thursday, March 21
Final, Monday, April 22, 4:30 p.m. – 7:00 p.m.

Late homework policy
Written assignments are specified to be PDF files and are due electronically on Sakai Courses at midnight on the due date. Programming assignments are due electronically on Sakai Courses at midnight on the due date. Half credit for homework one assignment late. No credit thereafter. See the course web page for programming homework policy.

Course evaluations
Course evaluations are required online near the end of the semester and count as a homework assignment. After you complete the evaluation, use the feature that notifies me of your proof of completion for this course.

Attendance policy
Attendance is important and may affect your final grade. You are responsible for making sure that your attendance has been recorded. Please provide written documentation for excused absences. There will be no makeup exams. If you miss an exam due to illness or an unexpected major emergency, the final exam score will be substituted for your missed exam score. Doctor's note required for all missed exams.

Accessibility notice
Any student with a documented disability (physical, learning, or psychological) needing academic accommodations should contact the Office of Student Accessibility (SAC 105, x6500) as early in the semester as possible. All discussions will remain confidential. Please visit https://www.pepperdine.edu/student-accessibility/ for additional information.

Academic integrity
See http://seaver.pepperdine.edu/academicintegrity/ for the academic integrity standards at Seaver College.

Mission support

See https://www.pepperdine.edu/about/our-story/mission-vision/ for the mission statement of the university and https://seaver.pepperdine.edu/about/our-story/seaver-mission/for the mission statement of Seaver College. This course supports these mission statements by investigating the truth of its discipline and by preparing students for lives of service to others in the field of computer science.