Course Syllabus

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POINT LOMA NAZARENE UNIVERSITY	**Department of Mathematical, Information, and Computer Sciences** **CSC 4054: Computer Architecture and Assembly Language** **Number of Units: 4**
Spring 2021 | **March 1 - June 4** **Finals Week June 7-11**	

Meeting days: MWF	**Instructor: Dr. Lori Carter**
Meeting times: 8:30-9:35	**Phone: 619-849-2352**
Meeting location: Zoom	**Email: lcarter@pointloma.edu**
Office Hours Zoom: by appointment	**Office hours: Zoom by appointment**

PLNU Mission

To Teach ~ To Shape ~ To Send

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

Department Mission

The Mathematical, Information, and Computer Sciences department at Point Loma Nazarene University is committed to maintaining a curriculum that provides its students with the tools to be productive, the passion to continue learning, and Christian perspectives to provide a basis for making sound value judgments.

HEALTH AND SAFETY UPDATE

It is expected that all students will abide by the health and safety standards set by the university. Here is a link to the most current **Health and Safety Guidelines. (https://www.pointloma.edu/coronavirus-covid-19-information)**

COURSE DESCRIPTION

This course covers the fundamentals of current pipelined computer designs. Experience with assembly language programming and digital logic and circuit design will be used to motivate the need for certain facets of the more general instruction set architecture. Throughout the course, performance issues, hardware constraints, and memory hierarchy will be shown to inform processor design. Additional topics include integer and floating point arithmetic, I/O and considerations surrounding multi-core architectures. Lecture three hours and laboratory two hours each week.

Course Organization:

Lectures: Cover the highlights of chapters assigned – not a substitute for reading. Student versions of the lecture slides can be obtained from Canvas. Lectures will come in both synchronous and asynchronous delivery modes. Attendance at synchronous meetings will count towards your final grade.

- If class is being held only virtually, the synchronous meetings will generally occur on Wednesdays.
- If we are able to be together face-to-face, it is likely that half of the class will attend lecture on Wednesday, and half on Friday.
- Note that the two midterm **exams will be held on Monday.**
- Video presentations will be provided as well, and are expected to be watched prior to the synchronous meetings. There will short asynchronous quizzes based on the video presentations and your reading. Quizzes are open book, but not open friend. **No late quizzes are accepted** but I will drop the lowest lab/homework and quiz grades.

Labs/Homework: Expect to have weekly lab and/or homework assignments. An unfinished lab/homework may be turned in on time for partial credit. Labs will contain questions that require analysis and thought. Often, a large point value will be assigned to these answers. They should be original, and in your own words. If it appears that 2 (or more) people have turned in 1 lab when this is not authorized, I will split the points or potentially give each person a zero.

Late labs/homework are accepted up to 2 days late for half credit. **Past that time, they are not accepted.**

All labs and video quizzes are due before Tuesday at midnight. I am assigning a single due date for simplicity and maximum flexibility, but turning things in early is encouraged.

Exams: There will be 2 exams. Exams will cover lecture as well as lab material. The first will cover chapters 1, 2 and Appendix A. The second will cover Appendix B and chapters 3 and 4. Students missing a midterm exam for a school function must arrange to take the exam in advance. Missed exams will likely result in a grade of 0. **Exams are currently scheduled for 3/29 and 5/3. Note that these are Mondays.**

Final Exam: Cumulative exam covering lecture and lab material. The Final exam is scheduled for **Wednesday of finals week at 7:30 A.M.**

The final exam date and time is set by the university at the beginning of the semester and may not be changed by the instructor. This schedule can be found on the university website and in th course calendar. No requests for early examinations will be approved. Only in the case that a student is required to take three exams during the same day of finals week, is an instructor authorized to consider changing the exam date and time for that particular student.

COURSE LEARNING OUTCOMES

Students will analyze the interaction between hardware and software.

Students will collaborate effectively in teams.

Specific Course Objectives:

- To provide an in-depth treatment of computer architecture, including digital logic, digital systems, computer pipelines, memory organization and processor design, both single and multi-core.
- To gain further understanding of computer organization and architecture by studying the MIPS assembly language and writing and analyzing programs using the SPIM simulator.
- To gain a better overall perspective of the interrelationship between computer architecture and other aspects of computer science including compilers, operating systems and programming.
- To gain an understanding of the tradeoffs considered when designing for increased performance including parallelism, power, convenience, and cost.

REQUIRED TEXTS AND RECOMMENDED STUDY RESOURCES

Patterson and Hennessy, Computer Organization and Design. 5th edition. Morgan Kauffman. Expect to cover most sections of chapters 1-6 along with Appendices A and B.

COURSE CREDIT HOUR INFORMATION

In the interest of providing sufficient time to accomplish the stated Course Learning Outcomes, this class meets the PLNU credit hour policy for a 4 unit class delivered over 15 weeks. It is anticipated that students will spend a minimum of 37.5 participation hours per credit hour on their coursework. For this

course, students will spend an estimated 150 total hours meeting the course learning outcomes. The time estimations are provided in the Canvas modules.

ASSESSMENT AND GRADING

Grade categories will be weighted as follows:

Video quizzes 10%

Participation 5%

Labs/Homework 35%

Exams 30%

Final Exam 20%

Student grades will be posted in the Canvas grade book no later than midnight on Tuesday of each week beginning in Week Two of this course. It is important to read the comments posted in the grade book as these comments are intended to help students improve their work. Final grades will be posted within one week of the end of the class. Grades will be based on the following:

Standard Grade Scale Based on Percentages

A	B	C	D	F
A 93-100	B+ 87-89	C+ 77-79	D+ 67-69	F Less than 60
A- 90-92	B 83-86	C 73-76	D 63-66	
	B- 80-82	C- 70-72	D- 60-62	

INCOMPLETES AND LATE ASSIGNMENTS

All assignments are due before midnight on Tuesdays. Incompletes will only be assigned in extremely unusual circumstances.

PLNU COPYRIGHT POLICY

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

PLNU ACADEMIC HONESTY POLICY

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one’s own when in reality they are the results of another person’s creativity and effort. A faculty

member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See **Academic Policies (http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278)** for definitions of kinds of academic dishonesty and for further policy information.

PLNU ACADEMIC ACCOMMODATIONS POLICY

While all students are expected to meet the minimum standards for completion of this course as established by the instructor, students with disabilities may require academic adjustments, modifications or auxiliary aids/services. At Point Loma Nazarene University (PLNU), these students are requested to register with the Disability Resource Center (DRC), located in the Bond Academic Center. (**DRC@pointloma.edu (mailto:DRC@pointloma.edu)** or 619-849-2486). The DRC's policies and procedures for assisting such students in the development of an appropriate academic adjustment plan (AP) allows PLNU to comply with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. Section 504 (a) prohibits discrimination against students with special needs and guarantees all qualified students equal access to and benefits of PLNU programs and activities. After the student files the required documentation, the DRC, in conjunction with the student, will develop an AP to meet that student's specific learning needs. The DRC will thereafter email the student's AP to all faculty who teach courses in which the student is enrolled each semester. The AP must be implemented in all such courses.

If students do not wish to avail themselves of some or all of the elements of their AP in a particular course, it is the responsibility of those students to notify their professor in that course. PLNU highly recommends that DRC students speak with their professors during the first two weeks of each semester about the applicability of their AP in that particular course and/or if they do not desire to take advantage of some or all of the elements of their AP in that course.

PLNU ATTENDANCE AND PARTICIPATION POLICY

Regular and punctual attendance at all **synchronous** class sessions is considered essential to optimum academic achievement. If the student is absent for more than 10 percent of class sessions (virtual or face-to-face), the faculty member will issue a written warning of de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. In some courses, a portion of the credit hour content will be delivered **asynchronously** and attendance will be determined by submitting the assignments by the posted due dates. See **Academic Policies (https://catalog.pointloma.edu/content.php?catoid=46&navoid=2650#Class_Attendance)** in the Undergraduate Academic Catalog. If absences exceed these limits but are due to university excused health issues, an exception will be granted.

Asynchronous Attendance/Participation Definition

A day of attendance in asynchronous content is determined as contributing a substantive note, assignment, discussion, or submission by the posted due date. Failure to meet these standards will result in an absence for that day. Instructors will determine how many asynchronous attendance days are required each week.

CLASS ENROLLMENT

It is the student's responsibility to maintain his/her class schedule. Should the need arise to drop this course (personal emergencies, poor performance, etc.), the student has the responsibility to follow through (provided the drop date meets the stated calendar deadline established by the university), not the instructor. Simply ceasing to attend this course or failing to follow through to arrange for a change of registration (drop/add) may easily result in a grade of F on the official transcript.

SPIRITUAL CARE

Please be aware PLNU strives to be a place where you grow as whole persons. To this end, we provide resources for our students to encounter God and grow in their Christian faith.
If students have questions, a desire to meet with the chaplain or have prayer requests you can contact the **Office of Spiritual Development (https://www.pointloma.edu/offices/spiritual-development)**

USE OF TECHNOLOGY

Since most courses will have online components, in order to be successful in the online environment, you'll need to meet the minimum technology and system requirements; please refer to the ***Technology and System Requirements* (https://help.pointloma.edu/TDClient/1808/Portal/KB/ArticleDet?ID=108349)** information. Additionally, students are required to have headphone speakers compatible with their computer available to use. If a student is in need of technological resources please contact **student-tech-request@pointloma.edu (mailto:student-tech-request@pointloma.edu)** .

Problems with technology do not relieve you of the responsibility of participating, turning in your assignments, or completing your class work.

Course Summary:

Date	Details	Due