Course Syllabus

Jump to Today | Edit

POINT LOMA NAZARENE UNIVERSITY	**Department: Mathematical, Information and Computer Sciences** **CSC 3014: Introduction to Computer Programming** **Number of Units: 4**
Spring 2022	

Meeting days, times, locations: TR 12:00-1:45 LA 101	**Instructor title and name:** Dr. Lori Carter, Professor of Computer Science
Phone: (619) 849-2352	**Email:** loricarter@pointloma.edu
Final Exam: Thursday 1:30	**Office Location:** RS 210 **Please email me to set up a zoom call. I will also respond to email questions.**

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.

MICS 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.

COURSE DESCRIPTION

A systems course focusing on operating systems, topics include basic operating system design, process management, device management, memory management, and file systems. Students are introduced to the basics of software evolution, reliability, concurrency, security and protection in the context of single-core, multi-core, distributed, and virtual environments. Class members gain experience using both GUI and command-line interfaces. In the course of implementing the CPU scheduling simulation, students understand the importance of thorough system testing and attention to system specs as they try to make parts of their systems work with those designed by their teammates.

COURSE LEARNING OUTCOMES

- Students will understand the interaction between hardware and software.
- Students will be able to explain the purpose of the Operating System, and where it fits into the computer system as a whole
- Students will be able to evaluate how a change in one part of the operating system will affect the operating system as a whole.
- Students will develop a working knowledge of the UNIX/Linux operating systems
- Students will be able to take from theory to design to implementation a module of an operating system.
- Students will have an understanding of the historical development, contemporary progress and societal role of computer science.
- Students will be able to list the 5 tasks of the operating system, describe what each is, and justify why it is important.
- Students will be able to state how ethics plays a role in OS development
- Students will be able to collaborate effectively in teams

COURSE ORGANIZATION

Lecture sessions: Our time together in class will be composed of formal lectures, short problems sets on which you can work with peers, quizzes, and lab times. The formal lectures will cover the highlights of chapters assigned and are not a substitute for reading. Student versions of the lecture slides can be obtained from Canvas.

On-line quizzes: Over the course of the semester, there will be approximately 10 online quizzes. These will mainly be due on Mondays, and cover the material lectured on (and related book sections) from the previous week. These are open book quizzes, with 2 chances to complete, and meant to keep you up to date on the material and prepared for upcoming exams. No quizzes are accepted late, but I will drop two of these quizzes.

In-class Quizzes: There will be 6 in-class quizzes. These will be based on essential skills and concepts mostly from labs. On the class session before the quiz, I will provide the information on what the quiz will cover. Quizzes cannot be made up, however 1 will be dropped. You may use any **strictly** hand-written notes (written by you) during the quiz.

Labs: Frequent labs based on the Linux/Unix operating systems, from the book, *Just Enough Unix* and other sources will be assigned. **Labs are due Wednesdays at midnight.** Labs may be completed for 70% credit by the following Thursday at noon. Beyond that, late labs are not accepted, but one will be dropped. An unfinished lab 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.

Exams: There will be 2 exams in addition to the final exam. These will only cover material presented since the last exam. If you will miss an exam for a school function, you must arrange to take it in advance. **If you ever miss an exam without giving me prior notice, there is a good chance you will receive a zero unless, of course, there was clearly a documented emergency.** Exam 1 is scheduled for **Feb. 17.** It will cover chapters 1 – 4 plus the appropriate chapters in the Unix book and related labs. Exam 2 is scheduled for **April 7** and will cover chapters 5-8 in your text and related labs.

Final Exam: Cumulative exam with an emphasis on material covered in the last part of the semester. The final is scheduled for the **Thursday of finals week at 1:30 PM**.

Simulation Project: A 3-week programming project based on process scheduling will be assigned. The entire project is due March 22, but there will be several intermediate due dates as well. In order to get full credit, all intermediate dates must be met as well as the final date. Unless otherwise stated, late portions are not accepted. **Most aspects of**

this project (exceptions will be noted) must be completed using basic Linux/UNIX tools (non-GUI). Programs will be written in C++ using the basic Linux Operating System (command-line) and g++ compilers. All written projects will be completed using a Linux/Unix text editor.

ASSESSMENT AND GRADING

In-class Quizzes 10%

Online Quizzes 7%

Exams 30%

Labs 25%

Scheduling Project 8%

Final 20%

Final grades will be based on the following:

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	

REQUIRED TEXTS AND RECOMMENDED STUDY RESOURCES

Silbershatz et.al, Operating System Concepts Essentials. Second ed. and Andersen, Paul, Just Enough Unix, Fifth ed.

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. An approximate breakdown of the time spent follows:

Assignments	Total Course Hours
Reading: Text and Notes	15
Lectures	40
Labs and Scheduling Project	65
Quizzes and preparation	15
Exams and preparation	15
TOTAL	150

STATE AUTHORIZATION

State authorization is a formal determination by a state that Point Loma Nazarene University is approved to conduct activities regulated by that state. In certain states outside California, Point Loma Nazarene University is not authorized to enroll online (distance education) students. If a student moves to another state after admission to the program and/or enrollment in an online course, continuation within the program and/or course will depend on whether Point Loma Nazarene University is authorized to offer distance education courses in that state. It is the student's responsibility to notify the institution of any change in his or her physical location. Refer to the map on **State Authorization (https://www.pointloma.edu/offices/office-institutional-effectiveness-research/disclosures)** to view which states allow online (distance education) outside of California.

INCOMPLETES AND LATE ASSIGNMENTS

All assignments are due either Monday or Wednesday at midnight. Most on-line quizzes are due Mondays at midnight. (There is 1 due Wednesday). No late on-line quizzes are accepted, but 2 are dropped. Labs are due Wednesdays at midnight. Labs may be completed for 70% credit by the following Thursday at noon. Beyond that, late labs are not accepted, but one will be dropped.

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** (https://catalog.pointloma.edu/content.php?catoid=52&navoid=2919#Academic_Honesty) for definitions of kinds of academic dishonesty and for further policy information.

PLNU ACADEMIC ACCOMMODATIONS POLICY

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities. Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center (**EAC@pointloma.edu** (https://mail.google.com/mail/?view=cm&fs=1&tf=1&to=EAC@pointloma.edu) or 619-849-2486). Once a student's eligibility for an accommodation has been determined, the EAC will issue an academic accommodation plan ("AP") to all faculty who teach courses in which the student is enrolled each semester.

PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their AP in that particular course and/or if they do not wish to utilize some or all of the elements of their AP in that course.

Students who need accommodations for a disability should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. It is the student's responsibility to make the first contact with the EAC.

FINAL EXAM DATE AND TIME

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.

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.

PLNU ATTENDANCE AND PARTICIPATION POLICY

Regular and punctual attendance at all class sessions is considered essential to optimum academic achievement. If the student is absent for more than 10 percent of class sessions, 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=52&navoid=2919#Academic_Honesty) 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.

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.

USE OF TECHNOLOGY

In order to be successful in the online or hybrid 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, microphone, or webcams compatible with their computer available to use. Please note that any course with online proctored exams require a computer with a camera (tablets are not compatible) to complete exams online.

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

ASSIGNMENTS AT-A-GLANCE

Mon	Tuesday	Wed	Thursday	Friday
(1)	Jan 11	12	13 Syllabus, overview of computer system, binary, 1.4,1.6-1.9 evolution of OS, basic services categories of OS	14

17 (2) MLK	18 1.11-1.12, Unix tutorial, Unix file system	19 Unix tutorial, Unix lab 2 due	20 Quiz on binary, basics of computer system. OS 2.1-2.3, start C lab	21
24 (3) Unix file sys quiz due	25 Lecture on system calls Start system calls lab. Lecture on OS chapter 2.4-2.5, 2.6-2.10	26 C and sys call labs due	27 Quiz on C and system calls Media Literacy Module Lab on text editor and C++	28
31 (4) OS design quiz due	Feb 1 Finish Media Literacy module OS Chapter 3.1-3.3 intro to processes, UNIX shells lab	2 C++, shells lab due	3 Quiz on shells, unix commands 3.4-3.6 interprocess communication and intro scripts OS scripting lab	4
7 (5) Processes quiz due	8 OS chapter 4 – threads work on threading lab	9 Scripting, threading labs due	10 Discuss thread lab Do first part of open source ethics module	11
14	15 Intro makefiles and do makefile lab. Finish Open source module	16 Makefile lab due Study for Exam 1	17 Exam 1	18
21	22 Go over exam OS chapter 5.1-5.2 concurrency. Concurrency lab OS 5.5-5.6 critical section	23 Nothing due	24 5.11 deadlock OS 6.1-6.3.2 intro to CPU scheduling, intro project	25

28 Deadlock quiz due FCFS cases due tomorrow	Mar 1 FCFS test cases due Work on project	2 SJF, Stubb/driver due tomorrow	3 SJF test cases due Stubbs/driver due Discuss FCFS algorithm	4
7 Spring break	8 Spring break	9 Spring break	10 Spring break	11 Spring break
14	15 Discuss priority, SJR, RR	16 Online SJR/RR quiz due	17 Quiz on priority, SJR, RR 6.5 -6.7 multiprocessor algorithms	18
21 Project code due	22 Project demoed, analysis completed Hospitality module	23	24 7.1-7.4 memory management	25
28 Intro to memory management quiz due	29 7.5-7.6 paging 8.1-8.4 start virtual memory	30 Study for quiz on paging	31 Quiz on paging Finish chapter 8 8.5…	Apr 1
4 Virtual memory quiz due	5 Review for exam Discuss mobile devices and scheduling/memory management	6 Study for Exam 2	7 Exam 2	8
11	12 Chapter 9 mass storage, disk management **Transparency module**	13	14 Easter brk	15 Easter brk
18	19	20	21	22

Easter brk Mass storage, disk management quizzes due	Chapter 10 File systems 11.1-11.4 file allocation	Study for quiz	Quiz on file allocation methods Discuss free space management 11.4-11.5	
25 File systems quiz	26 I/O system basics ch 12	27 OS system basics quiz	28 Protection and security basics ch 13,14	29
May 2	3	4	5 Final 1:30	

Course Summary:

Date	Details	Due
Wed Mar 10, 2021	Computing Environments Quiz (https://canvas.pointloma.edu/courses/60881/assignments/747717)	due by 11:59pm
Wed Mar 24, 2021	Week 4 video quiz: Processes (https://canvas.pointloma.edu/courses/60881/assignments/747732)	due by 11:59pm
Wed Apr 14, 2021	Week 7 Video Quiz: Deadlock (https://canvas.pointloma.edu/courses/60881/assignments/747725)	due by 11:59pm
Wed Apr 21, 2021	Week 8 video quiz: Intro to Memory Management (https://canvas.pointloma.edu/courses/60881/assignments/747723)	due by 11:59pm
	Week 8 Video Quiz: SJF and Priority Algorithms (https://canvas.pointloma.edu/courses/60881/assignments/747722)	due by 11:59pm
Wed Apr 28, 2021	Week 9 SJR and RR quiz (https://canvas.pointloma.edu/courses/60881/assignments/747724)	due by 11:59pm
Wed May 12, 2021	Week 11: Intro to Virtual Memory Quiz (https://canvas.pointloma.edu/courses/60881/assignments/747720)	due by 11:59pm
Thu May 13, 2021	Exam 2 doOver (https://canvas.pointloma.edu/courses/60881/assignments/747715)	due by 2pm

Date	Details	Due
Wed May 19, 2021	Week 12 Video Quiz: Mass Storage intro (https://canvas.pointloma.edu/courses/60881/assignments/747713)	due by 11:59pm
	Week 12: Page Replacement Quiz (https://canvas.pointloma.edu/courses/60881/assignments/747733)	due by 11:59pm
	Week 12: Thrashing Quiz (https://canvas.pointloma.edu/courses/60881/assignments/747729)	due by 11:59pm
Wed May 26, 2021	Week 13 Video Quiz: Disk Management (https://canvas.pointloma.edu/courses/60881/assignments/747727)	due by 11:59pm
	Week 13 video quiz: File systems (https://canvas.pointloma.edu/courses/60881/assignments/747730)	due by 11:59pm
Wed Jun 2, 2021	Week 14 Video Quiz: I/O System Basics (https://canvas.pointloma.edu/courses/60881/assignments/747726)	due by 11:59pm
	Week 14 video quiz: Protection (https://canvas.pointloma.edu/courses/60881/assignments/747716)	due by 11:59pm
Mon Jan 17, 2022	Get UNIX/Linux working (https://canvas.pointloma.edu/courses/60881/assignments/749460)	due by 11:59pm
Wed Jan 19, 2022	Intro to Linux/Unix (https://canvas.pointloma.edu/courses/60881/assignments/749773)	due by 11:59pm
	Linux/UNIX lab 2 (https://canvas.pointloma.edu/courses/60881/assignments/747496)	due by 11:59pm
Mon Jan 24, 2022	Unix File System Quiz (https://canvas.pointloma.edu/courses/60881/assignments/747718)	due by 11:59pm
Wed Jan 26, 2022	C Lab (https://canvas.pointloma.edu/courses/60881/assignments/747478)	due by 11:59pm
	System Call Lab (https://canvas.pointloma.edu/courses/60881/assignments/747504)	due by 11:59pm

Date	Details	Due
Thu Jan 27, 2022	Media Literacy Activity (https://canvas.pointloma.edu/courses/60881/assignments/747498)	due by 11:59pm
Mon Jan 31, 2022	Week 3 quiz - OS Design (https://canvas.pointloma.edu/courses/60881/assignments/747728)	due by 11:59pm
Wed Feb 2, 2022	Text Editor and C++ lab (https://canvas.pointloma.edu/courses/60881/assignments/747479)	due by 11:59pm
	Concurrency Lab (https://canvas.pointloma.edu/courses/60881/assignments/747493)	
	CSC 3014 Final Exam - Thursday 1:30 (https://canvas.pointloma.edu/courses/60881/assignments/747474)	
	CSC 3014 Final Exam - Tuesday 1:30 (https://canvas.pointloma.edu/courses/60881/assignments/747714)	
	CSC 3014 Final Exam - Tuesday Audrey (https://canvas.pointloma.edu/courses/60881/assignments/747731)	
	Disk Scheduling and File Allocation methods quiz - start at 12:30 (https://canvas.pointloma.edu/courses/60881/assignments/747475)	
	Emacs lab (https://canvas.pointloma.edu/courses/60881/assignments/747494)	
	Exam 1 (https://canvas.pointloma.edu/courses/60881/assignments/747721)	
	Exam 2 - starts at 12:30! (https://canvas.pointloma.edu/courses/60881/assignments/747476)	
	Exam 2 - starts at 12:30! (https://canvas.pointloma.edu/courses/60881/assignments/747719)	
	FCFS Module (https://canvas.pointloma.edu/courses/60881/assignments/747495)	

Date	Details	Due
	Makefile Tutorial (https://canvas.pointloma.edu/courses/60881/assignments/747497)	
	Open Source vs. Proprietary SW (https://canvas.pointloma.edu/courses/60881/assignments/747499)	
	RR and SJR quiz (https://canvas.pointloma.edu/courses/60881/assignments/747477)	
	Scheduler Analysis (https://canvas.pointloma.edu/courses/60881/assignments/747502)	
	Shell scripting lab (https://canvas.pointloma.edu/courses/60881/assignments/747503)	
	SJF Module (https://canvas.pointloma.edu/courses/60881/assignments/747500)	
	SJF Test Cases (https://canvas.pointloma.edu/courses/60881/assignments/747501)	
	Threading Lab (https://canvas.pointloma.edu/courses/60881/assignments/747505)	
	Unix shells lab (https://canvas.pointloma.edu/courses/60881/assignments/747506)	