La Roche College Computer Science Program

Course Syllabus

Semester: Fall 2017

Course Number: CSCI3040
Course Title: Operating Systems

Section No.   01

Credit Allowance: 3 Credits

Course Hours: 16 week (Full Semester) course

Location: Science Center 229
Days & Time: Monday and Wednesday, 2:00 – 3:29pm

Prerequisites: CSCI2035 or permission of the instructor

Faculty: Jeff Perdue
                    Office: SC218
                    Office hours: Monday 11:00 – 1:00 and Tuesday 1:00 – 3:00
                    Office phone: 412-536-1020
                    Email: jeffery.perdue@laroche.edu

Course Description: This course is an in-depth study of modern operating systems. Students will learn about the services provided by an operating system, how to use these services and how the services are implemented. Topics covered include: Initialization (boot), Processes, controlling shared resources, memory, bulk storage systems, and network communications (TCP/IP) as they relate to the computer operating system.

Course Objectives: Following successful completion of this course the student will be able to:

- Describe components of Modern Operating Systems, Special purpose operating systems, and basic OS services
- Describe typical OS boot sequence.
- Understand software life cycle and operating systems requirements.
- Use object, library, executable formats and analysis tools.
- Understand various memory allocation methodologies and process heap management.

- Understand basics of file I/O, storage system organizations and allocation of bulk storage systems.

Textbook: Abraham Silberschatz, Peter B. Galvin, Greg Gagne, *Operating System Concepts*. Second edition, Wiley, 2014.

Assignments: All assignments must be turned in by their due date. Late assignments will not be accepted without prior instructor approval. Late assignments without prior approval will be marked down by 10% per class period.

Course tools: Some assignments will use a Linux virtual machine. Students will need to load this virtual machine on their computer. Some programming assignments will use the "C" programming language.

Project: Students will complete a final project that refines and expands on one of the course operating system case study topics. The project consists of researching the internal structure and functions of a specific operating system (Linux, Windows or MacOS/IOS) and presenting the results of this research in class. Each student must prepare and present an individual presentation; however, it is OK and encouraged for you to work with the other students working on the same operating system to minimize duplication and maximize coverage of the case. Grading will be based on the accuracy and relevance of the presentation to the course content and on the quality of the presentation. Project assignments must be agreed upon by the midterm exam and will be presented during the class sessions scheduled for the case operating systems near the end of the course.

Attendance: It is expected that you will show up on time for each class. Class attendance and participation is part of the course grade. A sign in sheet will be provided at the beginning of each class.

Academic Policy: Students in this course are expected to comply with the La Roche College's Policy on Academic Integrity. Any student suspected of violating this obligation for any reason will be required to participate in the procedural process, initiated at the instructor level, as outlined in the academic handbook.

Accessibility Services: La Roche College is committed to providing equal opportunity for students with disabilities. If you have a diagnosed disability or if you believe you have a disability that might require reasonable accommodation in this course, please contact the Office of Accessibility Services so that such accommodations can be considered. Students with special needs or circumstances should meet with me privately at the beginning of the semester to discuss those needs and what adaptations will be made. Students will be asked to provide documentation of their disability to determine appropriate accommodations in consultation with the Coordinator of Accessibility and Compliance.

Medical Emergencies: If you have a medical condition that may interfere with class participation or might result in a medical emergency during the class period, please share this information with me in a confidential manner. The sharing of this private information might prove to be very valuable in an emergency.

Online Submissions: Online submissions at La Roche College require students to participate in a new security system. This new software system is used to verify a student's ID using just your mouse, touchpad, stylus, or touch screen, and all courses which require taking an exam and/or quiz online will require student verification. No special hardware or software downloads are necessary. This identification technology is from a company called Biometric Signature ID (BSI). Verifying student identification is a new mandate from the federal government that our institution needs to comply. Instructions to enroll can be found at https://intranet.laroche.edu/OL/bio-sig.cfm.

Methods of Instruction:
    Lectures and discussion
    Homework/programming assignments (20% of grade)
    Midterm exam (20% of grade)
    Final Project (20% of grade)
    Final exam (30% of grade)
    Class attendance and participation (10%)

Grading Scale

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

Course Topic Outline

Weekday	Date	Class	Topics
Monday	Aug 28	1	Course Intro and Overview
Wednesday	Aug 30	2	Chapter 01 - OS Intro
Monday	Sep 04		Labor Day - NO CLASS
Wednesday	Sep 06	3	Chapter 02 - Operating System Structures
Monday	Sep 11	4	Chapter 02 - Operating System Structures
Wednesday	Sep 13	5	Chapter 03 - Processes
Monday	Sep 18	6	Chapter 03 - Processes
Wednesday	Sep 20	7	Chapter 04 - Threads
Monday	Sep 25	8	Chapter 04 - Threads
Wednesday	Sep 27	9	Chapter 05 - Process Synchronization
Monday	Oct 02	10	Chapter 05 - Process Synchronization
Wednesday	Oct 04	11	Chapter 06 - CPU Scheduling
Monday	Oct 09		Fall Break - NO CLASS
Wednesday	Oct 11	12	Chapter 06 - CPU Scheduling
Monday	Oct 16	13	Review for Midterm
Wednesday	Oct 18	14	Midterm Exam
Monday	Oct 23	15	Chapter 07 - Main Memory
Wednesday	Oct 25	16	Chapter 07 - Main Memory
Monday	Oct 30	17	Chapter 08 - Virtual Memory
Wednesday	Nov 01	18	Chapter 08 - Virtual Memory
Monday	Nov 06	19	Chapter 09 - Mass-Storage Structure
Wednesday	Nov 08	20	Chapter 10 - File System Interface
Monday	Nov 13	21	Chapter 10 - File System Interface
Wednesday	Nov 15	22	Chapter 11 - File System Implementation
Monday	Nov 20	23	Chapter 11 - File System Implementation
Wednesday	Nov 22	24	Chapter 12 - I/O Systems
Monday	Nov 27	25	Chapter 12 - I/O Systems
Wednesday	Nov 29	26	Case Study / Presentations
Monday	Dec 04	27	Case Study / Presentations
Wednesday	Dec 06	28	Final exam review
Monday	Dec 11	29	Final Exam (2:00-3:30)