

CS643 Syllabus

15 May 2012

Description

Welcome to CS 643, an introduction to the algorithms and data structures of operating systems and their performance in various environments. Topics include CPU scheduling, memory management, virtual memory, mutual exclusion and deadlock, concurrent processes, and protection and security.

Wednesday 6–8:35pm in LLC 207. Three credits.

Contact information

Instructor: Prof. Christopher League, Ph.D.

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Phone: +1 718 488 1274 (office), +1 646 450 6278 (Google voice)

Office hours: Monday 11-12; Wednesday 11-12, 5-6; other times by appointment.

Office location: LLC 206

Resources

Software: As specified in Assignment 1

Course web site: <https://liucs.net/cs643s12/>

Text: *Operating System Concepts* by Silberschatz, Galvin, and Gagne. (8th edition, ISBN 0470128720). The 7th edition is fine too, if that saves you some money!

Other web resources: UNIX Tutorial for Beginners <http://www.ee.surrey.ac.uk/Teaching/Unix/>

Library: Campus library resources tailored for computer science are available at <http://www2.brooklyn.liu.edu/library/wlp/LibPortal-CS-BC.htm>

Tutoring is available from graduate assistants in the Computer Science department. The hours are Monday 11–6 and Tuesday–Thursday 1–6. Check signs posted around the department.

Goals and objectives

Upon completion of this course, I expect that you will be able to...

1. effectively use tools for software development (2.2, practicing level).
2. master the key concepts of operating systems and computer networks (3.1, mastery level).
3. exhibit awareness of professional organizations and technical opportunities (5.1, introductory level).
4. attend seminars and workshops outside of class work (5.2, practicing level).

Requirements

Your grade will be computed based on assignments, exams, and quizzes. There are a total of 1,000 points available, broken down as follows:

- There will be **7 assignments** during the semester. Most will involve programming, and some will also include short-answer questions. The programming assignments are based on a working operating system kernel called 'GeekOS', developed at the University of Maryland. Although it runs on real hardware, for convenience we will run GeekOS on a *virtual* machine called VirtualBox. The first assignment will have further details about how to set it all up. Assignments are worth **100 points each**, but I will **drop your lowest score** so only 6 assignments will count, for a total of **600 points**.
- There are **6 quizzes** scheduled throughout the semester, to make sure you are following along and reviewing your notes after each meeting. Quizzes are worth **50 points each**, but I will **drop the lowest two scores** so only 4 will count, for a total of **200 points**.
- There will be a final exam, worth **200 points**. Although there is no midterm, the quizzes will be representative of the kinds of problems on the final.

On the 1,000-point scale, you can expect the following letter grades:

	≥ 870: B+	≥ 770: C+	≥ 670: D+
≥ 930: A	≥ 830: B	≥ 730: C	≥ 600: D
≥ 900: A-	≥ 800: B-	≥ 700: C-	else: F

In the end, I may choose to adjust the scale slightly to compensate for assignments or questions that turned out to be trickier than I intended. Such adjustments would never *lower* your grade from what is designated in the above table; if you get 930 points, you are guaranteed an A.

Policies

No late assignments will be accepted, because we will discuss and evaluate your work promptly after the deadline. This helps to ensure that everyone receives timely feedback,

and that you can learn from mistakes while they are still fresh in your mind.

There will be no extra credit. Students usually ask for extra credit late in the semester after they have already messed up their original opportunities. Be sure to start your work early, so that we can detect and solve any problems before they can affect your grade.

Plagiarism is the use or presentation of ideas, words, or work that is not one's own and that is not common knowledge, without granting credit to the originator. Plagiarism is a practice that is not only unacceptable, but which is to be condemned in the strongest terms possible on the basis of moral, educational and legal grounds. Under University policy, plagiarism may be punishable by a range of penalties from a failing grade in the assignment or course to dismissal from the School of Business, Public Administration and Information Sciences. All students are required to read the handbook on avoiding plagiarism by visiting <http://bit.ly/1VShWN>

Cheating includes, but is not limited to the following: falsification of statements or data; listing sources that have not been used; having another individual write your paper or do your assignments; writing a paper or creating work for another student to use without proper attribution; purchase of paper or research work for one's submission as his/her own work; using written, verbal, or electronic or other sources of aid during an examination (except when expressly permitted by the instructor, depending on the nature of the examination) or knowingly providing such assistance to aid other students.

Showing up on time to class every week is extremely important. If you must be absent or more than 5 minutes late, please try to notify me in advance. I will be keeping track of whether you are in class, and when you arrive. A few missed classes will not count against you, but habitual absence will significantly hurt your grade. Additionally, there will be no make-up quizzes. I do not distinguish between 'excused' and 'unexcused' absence. Unless you miss an *exam* due to a severe medical emergency, I don't want to see a doctor's note. If you do miss an exam, the make-up exam will be different – and probably *not* easier.

Long Island University seeks to provide reasonable accommodations for all qualified persons with disabilities. This University will adhere to all applicable federal, state and local laws, regulations and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student's responsibility to register with Special Education Services (SES) as early as possible and to provide faculty members with the formal communication from SES for suitable accommodations. All accommodations must be approved through SES. Contact Information: 718 488 1221 or 718 488 1044.

Time commitment

New York State defines one credit as a total of 15 hours instructional time, plus 30 hours of student preparation. Thus, a typical three-credit course will amount to 45 hours instruction plus 90 hours preparation. (For these computations, an 'hour' actually consists of 50 minutes.)

In the blended format of this course, we interpret the New York State guidelines as follows. Face-to-face sessions last for three (50-minute) hours; eight such sessions yield 24 hours direct (face-to-face) instruction. Online resources and activities make up the

rest.

Our estimates of time commitments for each unit are given in the table below.

Module	Face-to-face instruction	Online instruction	Assignment preparation	Total hours
1	4	5	15	24
2	5	6	24	35
3	6	7	24	37
4	2	7	16	25
5	5	7	23	35
6	2	4	18	24
total	24	36	120	180

Schedule

Wed 18 Jan Meeting 1: Overview. *Read §1.1–1.6, 2.12.*

Wed 25 Jan Meeting 2: System calls. *Read §2.1–2.8.*

Wed 1 Feb Assignment 1 due at 23:59.

Wed 8 Feb Meeting 3: Processes. *Read §3.1–3.4. Quiz 1.*

Wed 15 Feb Assignment 2 due at 23:59.

Wed 22 Feb Meeting 4: CPU Scheduling. *Read §5.1–5.3, 5.5. Quiz 2.*

Wed 29 Feb Assignment 3 due at 23:59.

Wed 7 Mar Meeting 5: Memory management. *Read §8.1–8.5, 9.1–9.4. Quiz 3.*

Wed 21 Mar Meeting 6: File systems. *Read §10.1–10.4, 11.1–11.4. Quiz 4.*

Thu 22 Mar Assignment 4 due at 23:59.

Wed 4 Apr Meeting 7: Synchronization. *Read §6.1–6.6, 6.9, 7.1–7.3. Quiz 5. Assignment 5 due at 23:59.*

Wed 18 Apr Meeting 8: Distributed systems. *Read §18.1–18.4, 18.7. Quiz 6.*

Thu 19 Apr Assignment 6 due at 23:59.

Sun 6 May Assignment 7 due at 23:59.

Wed 9 May Final exam: Final exam