

CMP 426 (section A01C) CMP 697 (section A01C): Operating Systems Syllabus

Department of Computer Science
Lehman College, City University of New York
Summer 2020

Instructor: Steven Fulakeza

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Lecture Schedule: Mondays, Tuesdays, Wednesdays, and Thursdays, 2:30 pm - 5:55 pm

Lecture Location: <https://us02web.zoom.us/j/81031575857>

Office Hours: Mondays, Tuesdays, Wednesdays, and Thursdays 9:00 am - 10:00 am and 1:25 pm - 2:25 pm

Office Location: <https://us02web.zoom.us/j/81031575857>

Phone: (516) 240-5131

CMP 426 Course Description: 4 hours, 4 credits

Operating systems and their role in various types of computer systems; the principles of multiprogramming; algorithms for resource allocation; multiple-computer systems.

CMP 697 Course Description: 4 hours, 4 credits

A study of the functions and implementation of operating systems for various sizes and types of computers. Processor, storage, and device management. Paging algorithms, thrashing. File systems, concurrency, deadlocking, semaphores, and synchronization.

PREREQ:

- CMP 334 and CMP 338

Course Objectives:

A study of the functions and implementation of operating systems for various sizes and types of computers.

- Topics include: introduction to computer systems, process and thread concepts, threads/process coordination, memory management, file/storage management, distributed operating system issues, protection and security issues.

Textbook:

- A. Silberschatz, P. Galvin, and G. Gagne, *Operating System Concepts*, 10th Edition, Wiley, 2018. ISBN 978-1-119-29967-7

Textbook Web Site: [text book web site](#)

- <https://www.os-book.com/OS10/>

References:

- Lecture Notes, Blackboard, and Course Website

Course Website:

- <http://comet.lehman.cuny.edu/sfulakeza/>

**Grade Policy:
CMP 426**

Activity	Percentages
Homework Assignments and Blackboard Quizzes	20%
Project	20%
Midterm Exam	30%
Final Exam	30%

CMP 697

Activity	Percentages
Homework Assignments and Blackboard Quizzes	20%
Project	20%
Midterm Exam	25%
Final Exam	25%
Research Paper and Presentation (for graduate students only)	10%

Makeup exam might be given only when a student's absence is unavoidable. In such a case, the student must file formal written request.

Exam Schedule:

- Midterm Exam due date: Monday, July 27th, 2019 by 2:30 pm.
- Final Exam due date: Thursday, August 6th, 2020 by 11:59 pm.

Makeup exam might be given only when a student's absence is unavoidable. In such a case, the student must file formal written request.

The exams will consist of two parts:

- A multiple-choice part that will be completed on Blackboard
- A written part, which will be posted on Blackboard and the course website. The exam must be submitted on Blackboard. No emailed work will be accepted.

Homework Assignments

Several homework assignments are given during lectures. Students need to work on the homework for preparing exams but may not need to submit the homework assignments to the instructor. **Some selected homework problems will be assigned as formal assignments to be submitted for grading.**

Students must work in their own assignments unless I state otherwise. No late assignments will be accepted. Homework assignments will include the following areas and more:

- Process creations/executions based on Linux/UNIX API and Win API
- Message based communications based on Linux/UNIX API

- Shared memory-based communications between processes based on Linux/UNIX API and WIN API
- Multithreading based on POSIX API, Win API, Java threads
- Java nexus IO (memory mapped IO), Windows memory mapped IO
- Synchronization based on UNIX System V API, POSIX API, Win API
- Linux kernel module programming/driver programming

Graduate Students Survey Research Paper - (For Graduate Students Only CMP 697): Research Paper (as a part of assignment) (10 - 12 pages double spaced in 12 fonts, Times Roman) in various contemporary research areas such as:

- Threading issues in Linux kernels,
- Fast mutual exclusions,
- Virtualization and cloud computing,
- File systems in solid state devices,
- In-memory file systems,
- In memory DBMS;

The ACM Computing Survey defines a survey paper as paper that summarizes and organizes recent research results in a novel way that integrates and add understanding to work in the field. A survey article assumes a general knowledge of the area; it emphasizes the classification of the existing literature, developing a perspective on the area, and evaluating trends."

- You can visit [ACM Computing Survey](#) to see examples on survey papers
- Paper Proposal Due (June 10, 2020): 1-2 pages including extended abstract with at least 5 references.

Survey Research Paper Structure:

1. Title, name, date, course number
2. Abstract: This is a brief summary that describes your entire paper. Your abstract should contain 150 - 300 words. You have to write this last.
3. Introduction: Your introduction should provide the background problem you are researching.
4. Body of the paper and discussion
5. Conclusion that summarizes the paper and describes future work for the research
6. Acknowledgement (If necessary)
7. References: ACM = Association of Computing Machinery

Some details about research paper writing and presentation will be discussed during office hours.

Academic Integrity and Plagiarism Policy

Statement may be found in student handbook. For more information, refer to <https://www.lehman.edu/student-affairs/documents/Final-Student-Handbook-Lehman-College-9-19-18.pdf>

Note: All incidents of cheating will be reported to the Vice President of Student Affairs.

Attendance

Students are expected to attend lectures and labs regularly and promptly. In the event of illness, or injury, students should notify me. Students who miss a class are responsible for learning materials presented in class and reading relevant textbook portions. If you need help, please do not hesitate to contact me or come to my office hours.

Accommodating Disabilities

Lehman College is committed to providing access to all programs and curricula to all students. Students with disabilities who may need classroom accommodations are encouraged to register with the Office of Student Disability Services. For more information, please contact the Office of Student Disability Services in Shuster Hall, Room 238, phone number, 718-960-8441.

Classroom Policies

- Take responsibility for your education and grades – Students have a common myth that because they pay tuition, they deserve to receive a passing credit. Students earn grades in accordance with course grading policies.
- Attend every class and get to class on time
- Submit all your work on time
- When having any academic difficulties, always seek assistance from your instructor

Course Outline:

Overview

Chapter 1: Introduction

Chapter 2: Operating-System Structures

Process Management

Chapter 3: Processes

Chapter 4: Threads and Concurrency

Chapter 5: CPU Scheduling

Process Synchronization

Chapter 6: Synchronization Tools

Chapter 7: Synchronization Examples

Chapter 8: Deadlocks

Memory Management

Chapter 9: Main Management

Chapter 10: Virtual Memory

Storage Management

Chapter 11: Mass-storage Structure

Chapter 12: I/O Systems

File System

Chapter 13: File System Interface

Chapter 14: File System Implementation

Chapter 15: File System Internals