Boston University Metropolitan College

Operating Systems

MET CS 575
Course Format -> On Campus
Wednesdays 6:00 PM – 8:45 PM
Spring 2020

Instructor: Dr. Mehrdad Nourai
Email: mnourai@bu.edu
Office hours: after class

Course Description
Overview of operating system characteristics, design objectives, and structures. Topics include concurrent processes, coordination of asynchronous events, file systems, resource sharing, memory management, security, scheduling, and deadlock problems. 4 credits.

Prerequisites:
MET CS 472 and MET CS 231 or MET CS 232. Or instructor's consent.

Text Book
Operating System Concepts 10th Edition, Silberschatz, Galvin, and Gagne - Wiley

Courseware
Blackboard website: https://learn.bu.edu/

Class Policies

1) **Attendance & Class participation** – Attendance and class participation are expected at all class meetings. Coming to class late, leaving early, or being absent can adversely affect your final grade. You are responsible for all materials discussed in class and all announcements made in class.
2) **Coursework Late Policy** – Each coursework (assignments and term-project deliervables) have due dates with generous timeframe to complete them. Do Not Wait, and Avoid pushing against the due dates. No extensions or exceptions will be scheduled. Please complete the coursework as soon as it is listed on the Blackboard. Late coursework will be reduced by 10% per day, accumulative. Any coursework submitted one week or more after the due date will be recorded as Zero.
3) **Coursework Submission Policy** – All coursework will be listed on the Blackboard and must be submitted on the Blackboard to be considered for grading. It is your responsibility for submitting the correct coursework under its designated item on the Blackboard to earn credit. To avoid any submission issues, it is recommended to download each submission to ensure it has been submitted correctly. Email, paper, wrong or missing submissions

without prior written authorization from the instructor, will be graded as zero. Submission of any coursework after the Final Exam will be graded as zero.

4) **Tests and Exams** – No make-up tests and exams will be given unless compelling and verifiable reason is given in advance.
5) **Assessments and Grading** – Grades are earned and the instructor reserves all the rights for his assessments. No regrading will be scheduled except in case of error.
6) **Bonus or Redo of Coursework** – There are No Bonus coursework, and No redo of any assignments, projects, tests, or exams. There is No additional coursework after the Final Exam to improve your grade, as this arrangement would then by fairness have to be extended to the rest of the class (an impossible situation).
7) **Incomplete and withdrawal** – An incomplete grade is rarely given. The student must meet the university's requirements plus the instructor's requirements as follows: student must have actively attended and participated throughout the semester, and successfully completed coursework with good grades, completed majority of the coursework but due to unforeseen circumstances toward the end of the semester, is unable to complete the last coursework. The instructor must be notified before the due date of the coursework with compelling and verifiable reason, and file for incomplete two-weeks before the Final Exam. It is student's responsibility to observe the university's guidelines and policies for withdrawal from the class to avoid earning a failing grade.
8) **Backup of Coursework** – It is your responsibility to keep secure backups of all coursework. Make sure that you have two backup medium, and backup often. Saving data locally does not consitude as a good backup strategy.
9) **Classroom Expectations** – Please respect your classmates by turning off your phone or other electronic devices before class begins, and do not use them during class. I encourage you to participate in class discussions and ask questions.
10) **Academic Conduct Code** – The students are held responsible for complying with the Academic Conduct Code policy. The following is an important message from the MET Dean: "Cheating and plagiarism will not be tolerated in any Metropolitan College course. They will result in no credit for the assignment or examination and may lead to disciplinary actions. Please take the time to review the Student Academic Conduct Code: http://www.bu.edu/met/metropolitan_college_people/student/resources/conduct/code.html. This should not be understood as a discouragement for discussing the material or your particular approach to a problem with other students in the class. On the contrary – you should share your thoughts, questions, and solutions. Naturally, if you choose to work in a group, you will be expected to come up with more than one and highly original solutions rather than the same mistakes."

Objectives

By the end of the course, students are expected to:

- Understand the fundamental concepts of operating systems, including OS structures, processes/threads management, synchronization, deadlocks, memory management, filesystems, disk, I/O, protection and security.
- Develop hands-on experience in Linux-programming.
- Be introduced to the Linux kernel source code and simple kernel-level programming.

Course Requirements

- Class discussions and participation
- Reading and studying
- Assignments
- Research Project
- Assessments
- Additional reading materials

Strategies for Learning

We will cover many materials that require critical thinking and practice to master. The following are strategies for in-depth learning of the materials:

- Attend class, participate in class discussions, and take notes.
- Read the textbook and any additional materials covered in class.
- Explore online resources, e.g., articles, tutorials, source code, documentation, etc.
- Form a study group.
- The more time and effort you expend, the more benefits you will receive.

Grading Policy:
The grade that a student receives in this class will be based on class participation, assignments, research project, tests and final exam. The grade is breakdown as shown below. All percentages are approximate and the instructor reserves the right to make necessary changes.

- 10% on assignments
- 10% on research project and class participation
- 20% on test1
- 20% on test2
- 40% on final exam

Letter grade/numerical grade conversion is shown below (9 means 9 repeats):

A (95-100) A- (90-94.9)
B+ (85-89.9) B (80-84.9) B- (77-79.9)
C+ (74-76.9) C (70-73.9) C- (65-69.9)
D (60-64.9) F (0 – 59.9)

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Class Meetings, Lectures & Assignments:

This is a tentative schedule & a live document. The instructor reserves the right to make changes.

Date	Topic	Readings Due	Assignments Due
January 22	Introduction	Chapter 1	
January 29	Operating-System Structures	Chapter 2	
February 5	Processes	Chapter 3	Assignment 1
February 12	Threads	Chapter 4	
February 19	Test 1		**Test 1 (Chapters 1, 2, 3, 4)**
February 26	CPU Scheduling	Chapter 5	Assignment 2
March 4	Synchronization Deadlocks	Chapters 6-8	**Research Project Deliverable 1**
March 11	Spring Recess		
March 18	Main Memory	Chapter 9	Assignment 3
March 25	Test 2		**Test 2 (Chapters 5, 6, 7, 8, 9)**
April 1	Virtual Memory, Mass-Storage Structure	Chapters 10, 11	**Research Project Deliverable 2**
April 8	I/O Systems Filesystems	Chapters 12-15	
April 15	Security & Protection	Chapters 16, 17	Assignment 4
April 22	Substitute Monday schedule of classes		
April 29	Research Project Discussions & Demo		**Research Project Deliverable 3**
May 6	Final Exam		**All covered materials**