

**CS 471-001: Operating Systems**  
**Spring 2017**  
**Department of Computer Science, George Mason University**

**Time and location:**

- Section: 001
- Tuesday and Thursday, 1:30pm - 2:45pm
- Robinson Hall A111

**Instructor:**

- [Dr. Parth Pathak](#)
- Email: [phpathak@gmu.edu](mailto:phpathak@gmu.edu)
- Office hours: Tuesday, 3:30pm - 5:30pm, or by appointment
- Office: Engineering building, Room 5318

**Description:**

- This course covers the concepts and design principles of modern operating systems, both from theory and practical aspects. Fundamental concepts such as processes, synchronization, scheduling and memory management will be presented.

**Prerequisites:**

- Grade of C or better in CS 310 and CS 367.
- The students should be fluent in C programming language in order to complete the coursework, which includes substantial programming projects.

**Course outcomes:**

Upon completion of this course, the students should be able to:

- Demonstrate knowledge about the role and purpose of the operating systems
- Be able to explain the features of operating systems found in different types of computer systems (e.g., mainframe systems, personal computers, multiprocessor systems, handheld systems)
- Demonstrate basic knowledge about the evolution of operating system concepts from early batch systems to today's sophisticated multiuser/multiprocessor systems
- Demonstrate knowledge about different approaches to operating system design and the involved trade-offs
- Be able to explain the main performance evaluation criteria for computer systems and how the operating system design can have an impact on these
- Show an understanding of the need for the concurrent operation of multiple tasks (processes/threads) and an ability to solve basic process synchronization problems that arise from concurrent operation settings

- Demonstrate the knowledge about process scheduling, basic memory management and file system management techniques and their impact on the overall performance
- Demonstrate the basic knowledge about distributed systems and how the ever increasing networking features have affected (and are affecting) operating system design
- Be able to implement a suite of basic algorithms proposed for the main OS services such as memory management and process scheduling

### Books:

- Required textbook:
  - Operating System Concepts by Silberschatz, Galvin and Gagne (9th Edition, John Wiley & Sons 2012, ISBN 978-1-118-06333-0)
- Recommended textbooks:
  - Operating Systems - Principles and Practice (2nd Edition, Recursive Books 2014, ISBN 978-0-9856735-2-9) by Anderson and Dahlin
  - Modern Operating Systems (4th edition, Pearson 2015, ISBN: 0-13-359162-X) by A. S. Tanenbaum

### Graduate teaching assistant (TA):

- TBD
- Email: TBD
- Office hours: TBD
- Office: TBD

### Topics:

- Introduction to operating systems and their architecture
- Processes and threads
- Process communication and synchronization
- CPU scheduling and deadlocks
- Memory Management and virtual memory
- File, I/O, and storage systems
- Protection and security
- Virtual machines
- Distributed systems

### Course material and computer account:

- All course material (announcements, slides, assignments, homeworks, etc.) will be available on the GMU Blackboard
- All students should have accounts on the VSE Unix cluster (aka zeus.vse.gmu.edu). Instructions and related links can be found [here](#). Your programs will be tested and graded on the zeus server.

## Grading:

- Your grade will be calculated using the following percentages:
  - Homework and programming assignments: 45%
  - Midterm exam: 25%
  - Final exam: 30%
- A total grade of less than 50 will result in an F

## Policies:

- Late submission:
  - Late submissions of homeworks and programming assignments will be penalized at 15% each day, and will not be accepted after 3 days of the due date
- Exams:
  - The midterm and final exams will be closed book
  - The final exam will be cumulative which means that it will include all topics discussed during the term.
  - No early exams will be given. If you must miss an exam, you should provide an official/verifiable proof of why you are missing the exam before the exam. Once it is validated, instructor can arrange a make exam.
- Honor code:
  - All students must adhere to the [GMU Honor Code](#) and the [Computer Science Department's Honor Code](#) Policies.
  - The students are supposed to work individually on the homeworks, assignments projects, unless told otherwise.
  - We reserve the right to use [MOSS](#) to detect plagiarism. Violation of the Honor Code will result in an F.
- Accommodations for disabilities:
  - If you have a documented learning disability or other condition that may affect academic performance, you should: 1) make sure this documentation is on file with Office for Disability Services (SUB I, Rm. 4205; 993-2474; <http://ods.gmu.edu>) to determine the accommodations you need; and 2) talk with me within the first week of the semester to discuss any accommodation needs.