COMP-4370 Course Syllabus

March 26, 2026

1 Course Information

Course Name	COMP 4370: Algorithmic Problem Solving DEPRECATED
Prerequisites	COMP-3003, COMP-3005
Required Textbook	Programming Principles and Practice Using C++

2 Course Description

This course provides an introduction to operating system concepts. Topics will include operating system history and structure, processes, threads, scheduling, process synchronization, deadlocks, memory management, and file systems.

3 Textbook and Materials

The textbook for the course is "XXXXXXXX" by Bjarne Stroustrup - second edition. More information can be found on the author's website (Links to an external site.). You will need a good internet connection and a laptop that meets DU specifications. (See `https://www.du.edu/it/support/how-to/students/laptops`). For technical support in using Canvas, please go to `http://otl.du.edu/knowledgebase/canvas`

4 Course Learning Objectives

- History of operating systems, types of operating systems

- Interrupts and traps, policy vs. mechanism of OS, vitualization

- Computing hardware, systems programming

- Processes vs. threads

- Programming with theads in C/C++

- Interprocess communication, locking (mutexes, semaphores)

- Process synchronization, producers and consumers and the reader/writer problem

- Scheduling and scheduling algorithms

- Deadlock: causes, detection, avoidance

- Memory management in operating systems

- Virtual memory, paging and segmentation, page swapping and replacement algorithms

- File systems

5   Course Outcomes

Upon successful completion of this course, students will have learned the following overall information:

1. What makes an operating system "tick"?

2. What the challenges are when programming an operating system or operating system kernel.

3. How memory and processes are managed by a modern operating system to provide a simplified system API to end users.

6   Program Level Goals

Courses in the cyber security MS program, including this one, should contribute to overall program level outcomes for students. This course contributes to the following program level goals:

1. Apply programming and core CS topics; including network programming, algorithms and data structures, and computer organization.

2. Utilize and comprehend at least one compiled programming language (C/C++) and two or more interpreted/scripting languages (Bash, Python).

3. Understand how modern operating systems work (with a leaning towards Unix style OSes). Be familiar with their security components (identification, authentication, access controls, auditing) and how to configure them.

7   Knowledge Units

This course covers the following NSA cybersecurity Knowledge Units:

1. Operating Systems Concepts (OSC, Core Technical CDE)

2. Low-level Programming (LSP, Optional KU)

3. Systems Programming (SPG, Optional KU)

8   NICE Framework Mapping

1. TBD

9   Grading Policy

Assignment	Weight
Homework	30%
Midterm Exam	30%
Final Exam	40%

10   Attendance Policy

Regular attendance is expected. Students are responsible for all material covered in class, including announcements and handouts.

11   Academic Integrity

All work submitted for this course must be the student's own original work. Any instance of plagiarism or cheating will be dealt with according to the university's academic integrity policy. Refer to the Student Rights and Responsiblities, as well as the University of Denver Student Honor code, here: `https://studentaffairs.du.edu/student-rights-responsibilities`

12   Disability Services

If you have a disability that may affect your ability to complete the work for this course, please contact the Disability Services office at: `https://studentaffairs.du.edu/disability-services-progr`

13   Schedule

Week	Topic
1	[Topic 1]
2	[Topic 2]
3	[Topic 3]
4	[Topic 4]
5	[Topic 5]