

# CPSC 410 OPERATING SYSTEMS

**Instructor:** Keith Perkins

**Office:** Luter 201-D

**Course Website:** <https://cnuclasses.github.io/CPSC410/>

**Office Hours:** Google Meet: <https://meet.google.com/mgu-bodg-xhd?pli=1&authuser=1>

MWF 10:15-11:15 AM

TTH 11:10-12:40 PM

Due to the pandemic, all office hours are virtual at the above Google Meet link. If these times do not work for you please drop me an email and we can set up something that does.

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## Description

The goal of this course is to introduce operating systems concepts, such as I/O processing, interrupt structure and multiprocessing-multiprogramming, job and resource management, batch and interactive processing and thread based operations.

## Objectives

The essential objectives of this course are to develop specific skills, competencies and points of view needed by professionals in the field, and gaining factual knowledge, such as terminology, classifications and trends.

Other important objectives are learning to apply course material and solving problems, and learning principles, generalizations or theories.

## Notes and Assignments

Course material will come from lecture notes, scholar, and the web.

## Prerequisites

CPSC 327

## Required Text

Operating Systems: Three Easy Pieces, Remzi H. Arpaci-Dusseau and Andrea C. Arpaci-Dusseau

<http://pages.cs.wisc.edu/~remzi/OSTEP/>

This is a free online textbook, you may also buy a hardcopy at the above website

## Compiler and Integrated Development Environments (IDE)

This course will use GNU GCC and Eclipse CDT and GNU C++ compiler 7.4.0

## Operating System

This course will use linux (specifically Ubuntu LTS 18.04 or later).

## Projects

There will be **up to** six projects assigned this semester. They are not equally weighed (See below)

Due dates will be clearly noted and observed. Projects turned in up to 1 week late will be penalized 50%. Projects later than 1 week will not be accepted.

Tentative project list: ( topics may be modified, projects may be dropped if necessary)

Project 1 – 50 points - Read in Process List

Project 2 - 150 points – Process switching algorithm

Project 3 - 150 points – Memory

Project 4 - 200 points – Multithreaded 1

Project 5 - 250 points – Multithreaded 2

Project 6 - 100 points – File Systems

## Grading

Grades will be based on programming assignments, 2 midterm exams and one final exam. I will not give make-up exams or accept any late projects except in cases of documented illness or valid justification.

A final grade will be calculated using the weights below:

Projects	40%
Midterm 1	20%
Midterm 2	20%
Final Exam	20%

Points	100-93	93-90	90-87	87-83	83-80	80-77	77-73	73-70	70-60	< 60
Grade	A (4.0)	A- (3.7)	B+ (3.3)	B (3.0)	B- (2.7)	C+ (2.3)	C (2.0)	C- (1.7)	D (1.0)	F (0.0)

## Topics

A tentative list of topics is given below.

TOPICS
<ul style="list-style-type: none"><li>• Computer System &amp; Operating System Overview</li><li>• Process Description &amp; Control</li><li>• Process scheduling</li><li>• Memory Management</li><li>• Threads &amp; Concurrency (Mutual Exclusion, Coordination &amp; Deadlock)</li><li>• I/O &amp; File Management</li></ul>

## Honor Code

The Honor Code will be strictly observed. All work must be done individually (except for assignments that explicitly allow teamwork). Cheating on any work will result in either a score of zero or an F for the course, and/or the filing of a case in the CNU honor court. Violation of the honor code may result in dismissal from the University.

## Class Conduct

Treat others in the class with respect. Please feel free to ask questions. Please arrive to class on time. Please turn off cell phones.

**University Statement on Diversity and Inclusion:**

The Christopher Newport University community engages and respects different viewpoints, understands the cultural and structural context in which those viewpoints emerge, and questions the development of our own perspectives and values, as these are among the fundamental tenets of a liberal arts education.

Accordingly, we affirm our commitment to a campus culture that embraces the full spectrum of human attributes, perspectives, and disciplines, and offers every member of the University the opportunity to become their best self.

Understanding and respecting differences can best develop in a community where members learn, live, work, and serve among individuals with diverse worldviews, identities, and values. We are dedicated to upholding the dignity and worth of all members of this academic community such that all may engage effectively and compassionately in a pluralistic society.

If you have specific questions, suggestions or concerns regarding diversity on campus please contact [Diversity.Inclusion@CNU.edu](mailto:Diversity.Inclusion@CNU.edu)

**Disabilities:**

In order for a student to receive an accommodation for a disability, that disability must be on record in the Office of Student Affairs, 3<sup>rd</sup> Floor, David Student Union (DSU). If you believe that you have a disability, please contact Jacquelyn Barnes, Student Disability Support Specialist in Student Affairs (594-7160) to discuss your needs.

Students with documented disabilities are to notify the instructor at least seven days prior to the point at which they require an accommodation (the first day of class is recommended), in private, if accommodation is needed. The instructor will provide students with disabilities with the reasonable accommodations approved and directed by the Office of Student Affairs. Work completed before the student notifies the instructor of his/her disability may be counted toward the final grade at the sole discretion of the instructor.

**Success:**

I want you to succeed in this course and at Christopher Newport. I encourage you to contact me during office hours or to schedule an appointment to discuss course content or to answer questions you have. During the Coronavirus pandemic, our conversations may need to be via electronic means. If I become concerned about your course performance, attendance, engagement, or well-being, I will contact you first. I also may submit a referral through our Captains Care Program. The referral will be received by the Center for Academic Success as well as other departments when appropriate (Counseling Services, Office of Student Engagement). If you are an athlete, the Athletic Academic Support Coordinator will be notified. Someone will contact you to help determine what will help you succeed. Please remember that this is a means for me to support you and help foster your success at Christopher Newport.

**Academic Support:**

The Center for Academic Success offers free tutoring assistance for Christopher Newport students in several academic areas. Center staff offer individual assistance and/or workshops on various study strategies to help you perform your best in your courses. The center also houses the Alice F. Randall Writing Center. Writing consultants can help you at any stage of the writing process, from invention, to development of ideas, to polishing a final draft. The Center is not a proofreading service, but

consultants can help you to recognize and find grammar and punctuation errors in your work as well as provide assistance with global tasks. Contact them as early in the writing process as you can!

You may contact the Center for Academic Success to request a tutor, confer with a writing consultant, obtain a schedule of workshops, or make an appointment to talk with a staff member about study skills and strategies. The Center is located in Christopher Newport Hall, first floor, room 123. You may email [academicsuccess@cnu.edu](mailto:academicsuccess@cnu.edu) or call (757) 594-7684.

### **Safety Protocols Specific to COVID-19 and Academic Instruction:**

Offering in-person instruction on campus requires everyone to take individual responsibility for reducing the risk of exposure for all campus community members both inside and outside the classroom. Irresponsible behavior jeopardizes not only your own health, but also that of your fellow students, friends, professors and advisors, and members of our staff. Therefore, you are expected to learn and diligently follow the safety protocols required by the University at all times. The following protocols apply specifically to instructional spaces and academic buildings.

Prior to leaving their residence hall room or home, students should:

- conduct daily health screenings; and
- pack CDC-approved face covering(s)-

Students cannot enter instructional spaces or academic buildings if they:

- are experiencing symptoms of any illness, regardless of whether they believe the illness to be COVID-19;
- are in isolation while waiting for COVID-19 test results;
- have been directed to quarantine by a University or health department official; or
- have been diagnosed with COVID-19 and have not been approved to return to campus by a healthcare provider.

All students must comply with safety protocols established by the university while inside instructional spaces, common areas, and offices. These protocols are subject to change, but as of 16 August 2021 include:

- attend only the classes and sections in which they are officially enrolled;
- sit in their assigned seats or work at their assigned stations every class period;
- wear a CDC approved face covering at all times\* (face coverings should cover the nose and mouth, be secured under the chin, and fit snugly against the sides of the face);
- use additional personal protective equipment as required for specific classes;
- refrain from sharing personal materials, such as pens, textbooks, etc., with others;
- follow all directional signs; and
- follow directives regarding office hours and advising appointments.

*\*Students who have received an exemption from the face covering requirement for health reasons must present the proof of the exemption provided by the Office of Student Affairs to the instructor upon entering the instructional space.*

Because non-compliance potentially endangers others, faculty members:

- are authorized to instruct anyone in non-compliance with safety protocols to correct the non-compliance or immediately leave the instructional space; and

- may submit referrals to CHECS to report non-compliance with safety protocols.

Faculty members may submit referrals through the Captain's Care Program to report absences as a way of identifying students who may have become ill. It would be appropriate to do so when students have not attended class or communicated with the faculty member in any way for a period of one week or longer.

**Course Materials:**

All content created and assembled by the faculty member and used in this course is to be considered intellectual property owned by the faculty member and Christopher Newport University. It is provided solely for the private use of the students currently enrolled in this course. To ensure the free and open discussion of ideas, students may not make available any of the original course content, including but not limited to lectures, discussions, videos, handouts, and/or activities, to anyone not currently enrolled in the course without the advance written permission of the instructor. This means that students may not record, download, screenshot, or in any way copy original course material for the purpose of distribution beyond this course. A violation may be considered theft. It is the student's responsibility to protect course material when accessing it outside of the physical classroom space.