CSCE-5640 Operating System Design
Syllabus, Fall 2025

Instructor:	Dr. Amar M. Maharjan
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Email:	amar.maharjan@unt.edu • Include CSCE 5640.002 in the subject line. • Always use your official UNT email address.
Locations:	Section 002: We 2:30 PM - 5:20 PM (NTDP K120)
Office Hours:	My office hours are from **11:30 AM to 1:30 PM on Mondays in NTDP E260J**. Please feel free to drop in or to set up an appointment by contacting me. If these office hours don't work for you, please let me know, and we can find another time to meet.
Zoom link:	https://unt.zoom.us/j/7033013440

TAs/IAs office hours: See canvas page "TAs/IAs: Office Hours Information"

Textbook: *Operating System Concepts* (10th Edition), by Abraham Silberschatz, Peter B. Galvin, and Greg Gagne, Wiley, 2018, ISBN 978-1-118-06333-0.

Course Web Page:
This course will use the Canvas learning management system (LMS) to distribute course materials, communicate and collaborate online, post grades, and submit assignments. You are responsible for checking the Canvas course site regularly for class work and announcements.

Operating Systems Design:
After a brief overview of the different issues, we will encounter during this course, we will review the principles of Operating Systems in detail. This course will focus specifically on the management of processes and their coordination, deadlocks, memory management, cpu scheduling, and security. If time permits, we will discuss some of the important issues in the area of distributed systems. While the course will loosely follow the textbook, however, we will study material from many other sources, e.g., journals. The course will strike a balance between the programmers (applied) perspective and a theoretical view of operating systems.

Course outcomes:
Students will be able to:

1. use the principles of processes and threads for abstraction of real-world events.
2. formulate solutions for mutual exclusion and process synchronization.
3. understand the concept of deadlock to develop deadlock free systems of processes.
4. understand principles of memory and resource management.
5. identify different process scheduling paradigms and utilize them in system development.
6. develop fundamental security features to protect systems and data.

I reserve the right to modify course policies, the course calendar, assignment or project point values, and due dates.

This course has digital components. To fully participate in this class, students will need internet access to reference content on the Canvas Learning Management System, a textbook, PuTTY (or a similar tool) to connect to the CSE servers, and WinSCP (or a similar tool) to upload/download files from the CSE servers. If circumstances change, you will be informed of other technical needs to access course content. Information on how to be successful in a digital learning environment can be found at Learn Anywhere.

Useful References:

1. *Modern Operating Systems, 5th edition, Published by Pearson, Andrew S. Tanenbaum, ISBN-13: 9780137618873*
2. *Advanced Concepts in Operating Systems* by M. Singhal and N. G. Shivaratri
3. *Operating Systems – Advanced Concepts* by M. Maekawa, A. Oldehoeft and R. Oldehoeft
4. *Operating Systems* by J. Bacon and T. Harris
5. *Operating Systems* by W. Stallings
6. *Advanced Programming in the UNIX Environment* by W.R. Stevens
7. *Beginning Linux Programming* by R. Stones and N. Matthew
8. Online references will be posted on the course website.

Tentative List of Topics (*subject to change*):

Date	***Topic***	***Chapter***
08/18 - 08/22	Syllabus, Introduction	1
08/25 - 08/29	Introduction, OS Structures	1, 2
09/01 - 09/05[1]	OS Structures, Processes	2, 3
09/08 - 09/12	Processes	3
09/15 - 09/19	Threads and Concurrency	4
09/22 - 09/26	Threads and Concurrency, CPU Scheduling	4, 5
09/29 - 10/03	CPU Scheduling	5
10/06 - 10/10	Synchronization Tools	6
10/13 - 10/17	Synchronization Tools, Deadlocks	6, 8
10/20 - 10/24	Deadlocks, Main Memory	8, 9
10/27 - 10/31	Main Memory	9
11/03 - 11/07	Virtual Memory	10
11/10 - 11/14	I/O and File System	11, 13
11/17 - 11/21	Protection and Security, Distributed Systems (time permitting)	16, 17
11/24 - 11/28[2]	-	-
12/01 - 12/05[3]	Review	
12/08 - 12/12	Final Exam	

Important Dates:

08/18: First Day of Class

[1]09/01: Labor Day (no classes)

[2]11/24 – 11/30: Thanksgiving Break (no classes)

[3]12/05: Reading Day (no classes)

12/13: Last Day of Session

See UNT Fall 2025 Semester Calendar

Homework:
There will be about 4-5 homework assignments. Homework assignments are to be completed **individually** unless specified otherwise. Homework will consist of problem sets as well as small programming assignments. It is important to spend the time experimenting with the various program elements, so start your homework promptly. All assignment submissions must be typed. **Handwritten assignments will not be graded.**

Projects:
There will be two projects for which you will be expected to work in small groups. The maximum group size will depend on the type of project and will be specified at a later time. The project must be accompanied by a detailed project report describing the problem, the implementation, experiments and results as well as their interpretation.

All assignments (homework, projects) are due at 11:59 pm on the due date.

Reading Assignments:
In addition to regular homework, there is a standing reading assignment of all chapters listed in the table above. Material covered in each of the textbook chapters assigned may form the basis for questions in homework, projects, and exams.

Exams:
There will be two exams:

- Section 002:
    - Mid exam: **Wednesday, October 15, 2025 (2:30 PM - 5:20 PM NTDP K120).**
    - Final exam: **Monday, December 08, 2025 (1:30 PM – 3:30 PM NTDP K120).**

The schedule of these exams is fixed and cannot be changed to accommodate individual circumstances except for a major illness or family emergency. In such cases, arrangements must be made before the time of the exam to take the exam at a different time. Makeup exams will not be given without such prior approval and only for the emergency cases indicated.

Grading:

Item	% of final grade
Attendance	5%
Quizzes	5%
Homeworks	25%
Projects	20%
Exams (2)	45%

Grading Policies:

- All homework assignments and projects must be turned in at the beginning of class on their respective due date. These assignments will be accepted up to 24 hours late and be assessed a 50% grade reduction penalty. Assignments submitted more than 24 hours late will not be accepted and receive a grade of 0. All assignment submissions must be typed.
- Grades will be posted on Canvas throughout the semester to provide an ongoing assessment of student progress, though final assessment will be measured using the weighted average above.
- **Once a grade is posted on Canvas, students have two (2) weeks to dispute the grade, unless otherwise instructed.**
- The proper channel for grade disputes is to first go to the original grader (either the TA or IA) in an attempt to resolve the issue. If, however, a resolution cannot be reached between the student and the grader, the student shall then go to the instructor who will have the final say on the grade.
- There will be NO "make-up" Exams. In case of verifiable emergencies, arrangements must be made with the instructor.
- **Lecture Section**: All students are expected to attend each class meeting. A student who misses class is still responsible for finding out what was discussed and to learn the material that was covered and obtain the homework that was assigned on the missed day. The instructor is not responsible for re-teaching material missed by a student who did not attend class. Therefore, each student is accountable for and will be evaluated on all material covered in this course, regardless of attendance. If there are extenuating circumstances preventing you from attending the class, please notify your instructor so that you can work together to ensure your success in learning the material.

Academic Integrity

According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University. Additionally, the following specific requirements will be expected in this class: assignments, quizzes, and exams are to be done independently. Any single incident of copying or duplication of work will get you zero. A subsequent occurrence of academic dishonesty will result in a grade of F for the course. If you are in doubt regarding the requirements, please consult with

me before you complete any requirements of the course. **You should not use program solutions found on the Internet or use answers from Generative AI/LLMs such ChatGPT, Gemini or Copilot.** You may use it as learning tools but never copy solutions from the internet or others. If you need help, you should ask the instructor. Cheating includes, but is not limited to, all forms of plagiarism and misrepresentation.
All department policies on Academic Integrity and Student Conduct apply for this course – these are available at the following link: https://engineering.unt.edu/cse/students/resources/academic-integrity.html. Any exceptions to these guidelines are noted explicitly in the syllabus.
A more complete policy will be made available soon, but for now be aware the "unauthorized" use of any person or technology that assists in a student's assignment, project, or paper is considered cheating under the UNT Student Academic Integrity Policy (UNT Policy 6.003). Unless a professor or instructor gives explicit "authorization," AI cannot be used to assist in the completion of assignments, projects, or papers. Doing so will result in a "cheating" violation. Again, if uncertain contact the instructor prior to using AI tools.

Course Evaluation
The Student Perception of Teaching (SPOT) survey is a requirement for all organized undergraduate classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in the feedback I get from students, as I work to continually improve my teaching. I consider SPOT to be an important part of your participation in this class.

ADA STATEMENT
The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking reasonable accommodation must first register with the Office of Disability Access (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with a reasonable accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request reasonable accommodations at any time; however, ODA notices of reasonable accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of reasonable accommodation for every semester and must meet with each faculty member prior to implementation in each class. Students are strongly encouraged to deliver letters of reasonable accommodation during faculty office hours or by appointment. Faculty members have the authority to ask students to discuss such letters during their designated office hours to protect the privacy of the student. For additional information, refer to the Office of Disability Access website (http://www.unt.edu/oda). You may also contact ODA by phone at (940) 565-4323.

ACCEPTABLE STUDENT BEHAVIOR
Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the

classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The university's expectations for student conduct apply to all instructional forums, including university and electronic classroom, labs, discussion groups, field trips, etc. The Code of Student Conduct can be found at http://deanofstudents.unt.edu.

STUDENT RESPONSIBILITY

Students are responsible for submitting the correct assignments (i.e., uploading the proper files) for each applicable assignment submission on Canvas. In certain cases, when an assignment is submitted on time, but to an incorrect assignment location (e.g., submitting Homework 03 to Homework 04 location on Canvas), the assignment may be assessed a 30% reduction penalty if the due date has passed. If you have any questions or concerns about your submission, please work with your instructor or IA to ensure the correct file(s) is/are submitted.

Emergency Notification & Procedures:

UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Canvas for contingency plans for covering course materials or change in calendar per the Emergency Notifications and Procedures Policy.