

# CS 4375: Theory of Operating Systems

Spring 2021

**Instructor:** Nigel Ward, nigel@utep.edu  
Office Hours: TTh, 2-3, or by appointment,  
in Blackboard for now; perhaps later in Computer Science 3.0408, also 747-6827

**TA:** Peter Hanson, pghanson@miners.utep.edu  
Office Hours: TBD, or by appointment,  
in Blackboard for now, perhaps later in CCSB G.0512

**Class Time:** TTh 10:30 – 11:50 in Blackboard

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

*Introduction to Computer Networks*, by Peter Dordal.

also recommended: *Modern Operating Systems* by Tannenbaum and *Operating Systems Concepts* by Silberschatz.

**Course Description:** Process and thread management, concurrency, memory management, processor scheduling, I/O management and disk scheduling, and file management.

**Goal:** Introduce concepts that will be foundational for further study, whether academic or professional, of 1) Computer Security and Forensics, 2) Systems Administration and Network Administration, and 3) Systems Programming and Network Programming, including developing for embedded systems, cloud systems, and high-performance systems.

## Course Policies

The prerequisite for this class is CS 3432 with a C or better.

Assigned readings are to be done before class.

Assignments are to be submitted in Blackboard, unless otherwise specified. The maximum points attainable for late assignments will be reduced by 10% per day or partial day of lateness, for up to five days, or more if the lateness impedes participation in class or the assignment is received after the solution has been discussed. Email submissions of assignments are not accepted unless otherwise specified.

Assignments are to be done individually unless specifically designated as group assignments. While you may discuss assignments with others, your solutions should be designed, written/assembled, and tested by you alone. If you need help, consult the TA or the instructor.

The use of found code and shared code is acceptable, unless otherwise specified, provided that you acknowledge your sources, state specifically what you used, and understand every line of code.

Programming assignments will be graded primarily on functionality, design quality, thoroughness of testing, and readability. Some of these factors inevitably involve subjective judgments; if you have questions about these or any other aspect of the grading, please see the TA or the instructor.

Tests will be closed-book, except that one single-sided page of hand-written notes may be used for the first test, two for the second test, and three for the final. Use of Lockdown Browser is required.

Grades will be based on four components, weighted approximately as follows: 45% assignments, 22%

final examination, 28% tests, and 5% other factors, including quizzes, in-class exercises, and participation.

Assignments and tests will be challenging. Grading will be on a points-earned basis (points above zero), rather than a points-off basis (points below expectation). Letter grades will be assigned accordingly: the A/B break will probably be around 80% and the B/C break around 70%. Final grades may be adjusted upwards in cases where performance on both the assignments and the tests is solid. Per-assignment grades will be found in Blackboard; overall grades will be communicated separately.

Students are free to attend class or not, bearing in mind that absence may annoy other students, interfere with learning, and result in a lower grade.

### General Policies

No make-up exams or assignments will be given except under the conditions set forth in the Catalog.

Students are expected to be punctual, and, as always, to conduct themselves professionally and courteously.

If you have or suspect a disability and need accommodation, contact the Center for Accommodations and Support Services at 747-5148 or at [cass@utep.edu](mailto:cass@utep.edu) or visit Room 106 Union East.

### Topics, Readings and Major Assignments, tentative

Introduction (3 days)	<i>Python warm-up assignment</i>	ADAD Ch. 1-4
Processes (3 days)	<i>Shell assignment</i>	ADAD Ch 5-7
Memory (3 days)	<i>sundry exercises</i>	ADAD Ch 13-18
		Test 1
Networking Basics (4 days)	<i>sundry exercises</i>	Dordal Ch. 1, 9
Threads and Concurrency (6 days)	<i>Concurrency assignment</i>	ADAD 15-18, 31-21
		Test 2
Networks: Asynchrony, Security (2 days)	<i>Sockets assignment</i>	Dordal Ch. 17-18, 28
Files and Devices (4 days)	<i>sundry exercises</i>	ADAD Ch. 35-41
		Final Exam

**Course Website:** <http://www.cs.utep.edu/nigel/os/>

### Important Dates (tentative)

January 19: Class begins  
February 18: Test 1  
March 15-19: Spring Break  
April 1: Test 2  
May 7: Dead Day  
May 13: Final Exam, 10:00-12:45

## **Outcomes**

### **Level 1: Knowledge and Comprehension**

Level 1 outcomes are those in which the student has been exposed to the terms and concepts at a basic level and can supply basic definitions. The material has been presented only at a superficial level.

Upon successful completion of this course, students will be able to:

... TBD...

### **Level 2: Application and Analysis**

Level 2 outcomes are those in which the student can apply the material in familiar situations, e.g., can work a problem of familiar structure with minor changes in the details.

Upon successful completion of this course, students will be able to:

... TBD...

### **Level 3: Synthesis and Evaluation**

Level 3 outcomes are those in which the student can apply the material in new situations. This is the highest level of mastery.

Upon successful completion of this course, students will be able to:

... TBD...