

COURSE SYLLABUS

Semester: Fall 2023

Course Prefix/Number: COP4634

Course Title: Systems & Networks I.

Course Credit Hours: 3.0

Class meeting time: TR 4:00 – 5:15 pm

Instructor's Name and Contact Information:

Dr. Thomas Reichherzer
Computer Science
Building 4, Room 227 (main campus)
Email: treichherzer@uwf.edu
Phone: (850) 474-2612.
Office Hours: (any section)
Monday, Tuesday: 12:30 pm – 1:30 pm

Course Website: [84193 COP4634 202308](#)

Prerequisites or Co-requisites:

- CDA 3101 Introduction to Computer Organization or EEL 3701 Digital Logic and Computer Systems
- COP 3530 Data Structures & Algorithms I

Course Description: This course reviews the fundamental principles of modern operating systems and relates them to computer programming. Students learn about the design of operating systems and the services they provide to end-users and application developers.

Topics covered in this course include:

- processes and threads,
- CPU scheduling,
- synchronization mechanisms,
- memory management,
- file systems and mass storage devices,
- inter-process communication such as shared memory, pipes, and message passing,
- IO systems,
- deadlocks,
- security & protection.

Coursework: You are expected to complete assigned readings, work diligently on assigned programming projects and individual homework assignments, and prepare exceptionally well for exams to achieve the highest grade in the class. You must complete several programming

projects in teams of two, individual homework assignments, and three written exams. You are also expected to participate in classroom discussions.

Programming projects require you to solve several programming problems. Reach out to a classmate to form a team of two for the semester, to work on programming projects collaboratively. Contact me via email when you have formed a team. Project start and due dates are specified in the schedule below and the *Canvas* Assignments and Calendar page.

To assist with code development among team members and to share code with your instructor, I recommend you use GitHub, a Web-based version control system. If you chose to participate in GitHub sign up [here](#) using your UWF email address to create an account. You will be given access to a private repository for the semester that only your team and the instructor can access to share code.

The final programming solution must be uploaded to the specified *Canvas* Dropbox; individual homework assignments must be submitted online in *Canvas* as answers to a quiz. Emailed assignments will not be accepted. Detailed submission instructions will be given on the assignments and in the course shell in *Canvas*. You are expected to complete work on schedule. Deadlines are part of the real-world environment for which you are prepared. Finally, your code must compile and execute on the department's public Linux servers listed in the project description (see *Resources* below) to obtain full credit for your solution. If your code does not compile on the designated server, there will be a substantial deduction on your project grade.

Expected Outcome: At the conclusion of this course, students should be able to

- explain the role of a modern operating system in program execution,
- understand thread and process scheduling and their synchronization,
- use methods for thread synchronization to protect shared data,
- explain methods of memory organization and access,
- understand important concepts of hierarchical file systems,
- explain how devices interact with memory and the CPU to transfer data,
- recognize and resolve deadlock issues,
- understand security issues and protection methods of modern operating systems.

Technology requirements: Programs must be written in the C++ programming language. You may use the computer systems provided in the Computer Science laboratory and the department's Linux server, which offers a GNU C++ compiler and a simple text editor. You will be given instructions on the programming environment in *Canvas* and the programming assignments.

Textbooks: Abraham Silberschatz, Peter Galvin, and Greg Gagne, *Operating System Concepts*, 10th Edition, Wiley, 2018, ISBN 9781119439257.

Grading:

- 5% attendance
- 30% programming projects
- 15% individual assignments
- 25% midterm exams (Midterm I + Midterm II)
- 25% final exam

Final grades will be assigned using the standard UWF grading scale:

100-93	92-90	89-87	86-83	82-80	79-77	76-73	72-70	69-67	66-63	< 63
A	A-	B+	B	B-	C+	C	C-	D+	D	F

Grading Policies: The lowest programming project and homework assignment will be dropped before calculating the final GPA. Therefore, although not recommended since the assignments help with exam preparations, you can miss an assignment, and it will not affect your final grade. However, because of this policy, I will not accept any late assignments for any reason (computer malfunction, Internet connection failure, job, medical problem, etc.).

It is the student's responsibility to check graded assignments when they are returned to you. I will gladly re-grade an assignment when a question or mistake is brought to my attention. To ensure fairness, I reserve the right to re-grade the entire assignment. As a result, your grade may increase, decrease, or remain the same. Grades will not be changed after two weeks from the date graded assignments are returned to the class. A Graduate Assistant (GA) may assist the instructor with grading programming assignments. Please contact the instructor if you have a question or need more extensive feedback on an assignment.

Exams: The exams will be given electronically as a quiz in Canvas in the classroom, where we meet weekly. Information on preparing for the exams is available in your Canvas course shell.

You may have noticed that the exams are weighed heavily in relation to the homework and programming assignments. The higher weighting of the exam grade is by design. Assistance, resources, and time are plentiful for the homework and programming assignments; however, you are on your own during the exam, making them a true test of your ability to solve problems. Therefore, you must prepare extensively for the exams, or there will be a significant difference between your assignment and your exam grades. Makeup exams will NOT be given except with a serious, documented medical or legal excuse. You are required to notify your instructor in a timely manner to explain your situation and make arrangements for the makeup test.

Academic Conduct: The [Student Code of Academic Conduct](#) defines various forms of academic misconduct, including cheating and plagiarism, and describes the process for addressing these types of allegations. All students are expected to read the Student Code of Academic Conduct and comply with the expectations. More information and links to the University regulation governing academic conduct can be found on the [Dean of Students website](#).

All assigned work should be assumed to be completed by the student without borrowing code from unapproved resources, including but not limited to online resources (Chegg, Stack Overflow, forums, YouTube, etc.) and other students (past or present, from this institution or

another). This means that students should write their code, not work together on assignments, search for solutions or parts of a solution online, or share their solutions online with other students or in a publicly accessible way. Students should contact the instructor or the approved tutors provided by the Computer Science department for guidance or further explanation of the course materials provided.

Minimum Technical Skills and Special Technology Utilized by Students: UWF prepares students for current and future business and life applications using basic technology. Each UWF student is expected to do the following:

- Activate a MyUWF student account
- Access the MyUWF portal a minimum of 2-3 times a week
- Access UWF email account (Gmail) 2-3 times a week
- Have basic word-processing knowledge

Student use of UWF information technology resources is governed by the Computing Resources Usage Agreement and the Student Communications Policy. Visit the [Minimum Technical Skills and Special Technology Utilized by Students](#) page for more information on the minimum computer requirements, technical skills, and special technology considerations.

Fall 2023 Course Modality: The University of West Florida operations may be disrupted from time to time by weather, pandemics, and other events outside of our control. It is important for faculty and students alike to plan for contingencies that may affect individual course sections. With this in mind, faculty may opt to hold some class meetings in a modality other than that originally planned in order to make certain that the class continues in the best manner possible, given the immediate circumstances. It is important to be flexible and understand that we are operating in a dynamic environment.

Class Recording: Without prior notice, students may record video or audio of a class lecture for a class they are enrolled in for their own personal, educational use. A class lecture is an academic presentation delivered by faculty or guest lecturer as part of a University of West Florida course intended to inform or teach enrolled students about a particular subject. The following actions are prohibited: recording class activities other than class lectures, including but not limited to lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), clinical presentations such as patient history, academic exercises involving student participation, test or examination administrations, field trips, and private conversations between students in the class or between a student and the faculty member. Recordings may not be used as a substitute for class participation and attendance and may not be published or shared without the written consent of the faculty member. Failure to adhere to these requirements may constitute a violation of UWF-REG 3.010 Student Code of Conduct and may be a violation of the law. More details can be found in the [UWF Student Handbook](#).

TurnItIn: UWF maintains a university license agreement for an online text-matching service called Turnitin. Instructors may use the Turnitin service to evaluate the originality of student papers at their discretion. Instructors can employ other services and techniques to evaluate your work for evidence of appropriate authorship practices as needed.

Sexual Discrimination or Harassment Reporting: University of West Florida faculty members are committed to supporting students and upholding the University's non-discrimination and harassment policies. Under Title IX, discrimination and harassment based upon sex or gender (including sexual violence and sexual misconduct) are prohibited. If you experience an incident of sex/gender-based discrimination or harassment, you do not have to go through the experience alone. Know that while you may talk to a faculty member, as a "Responsible Employee" of the University, the faculty are required to notify the University's Title IX Coordinator so that support services can be provided to you. If you would like to speak with someone confidentially, you may schedule an appointment with the UWF's Counseling and Psychological Services at (850) 474-2420. This service is free for students. Faculty can also help direct you to, or you may independently access the [University's Title IX website](#).

Civil Discourse: At the University of West Florida, learning involves a variety of ideas, theories, and evidence. Presentation of these ideas does not represent an endorsement of any one idea or perspective. It is vital to the UWF academic mission that we foster an environment that allows for the open exchange of ideas and perspectives to advance the learning objectives for each course. Civil discourse within and outside the classroom is a vital component of the UWF academic environment and is expected of everyone who belongs to the UWF community. Students and faculty may engage with complex ideas in class, and students will often be asked to demonstrate an understanding of the ideas. Understanding an idea, concept, or theory does not require endorsing or agreeing with it, but rather hearing and considering its strengths and weaknesses. More information about civil discourse can be found on the [Dean of Students webpage](#).

Health and Safety Protocols: The University of West Florida is dedicated to maintaining the best learning environment possible for our entire community of students, faculty, and staff. We are the University of West Florida. Each of us, and all of us, by the act of stepping onto this campus and into a classroom, accept the responsibility as UWF Argonauts to help make this a safe place to learn. The university will continue to rely on guidance from the Florida Department of Health and the Centers for Disease Control and Prevention to pass on any changes in protocols for health and safety should the need arise. Students are encouraged to consult with their instructors regarding absences and missed work.

Dean of Students: The Dean of Students Office works to create a culture of care by helping students experiencing challenging or difficult life circumstances which might impede academic success. The Dean of Students Office can assist you with academic, financial, medical, or other

extenuating circumstances. Please contact the Dean of Students Office at (850) 474-2384 or email deanofstudents@uwf.edu.

Student Accessibility Resources: The University of West Florida supports an inclusive learning environment for all students. If there are aspects of the instruction or design of this course that hinder your full participation, such as time-limited exams, inaccessible web content, or the use of non-captioned videos and podcasts, reasonable accommodations can be arranged. Prior to receiving accommodations, you must register with Student Accessibility Resources and submit a semester request each semester. Appropriate academic accommodations will be determined based on the documented needs of the individual. For information regarding the registration process, visit the [SAR website](#), email sar@uwf.edu or call 850.474.2387.

Veterans Services: The [UWF Military & Veterans Resource Center \(MVRC\)](#) serves as a leading campus advocate for military and veteran students, working to ensure the needs of these individuals are met through coordinating with multiple university offices and services. The center provides assistance with the following: GI Bill ® education benefits, active duty tuition assistance, out-of-state fee waiver, tutoring, paper reading, counseling, disability accommodations, coordinating academic advising, and referral to state /federal resources and services. The MVRC is located in bldg. 38. For more information on MVRC service, call 474-2550.

Physical Health: All enrolled students have access to The Student Health Clinic, which is a primary care clinic where students can receive medical care or advice. Contact [Student Health Services](#) at (850) 474-2172 for health concerns.

Mental Health Support: At the University of West Florida, we recognize that to learn, thrive, and flourish; you may need a little assistance. Please take advantage of the free resources online or on campus.

- For mental health or substance use concerns, contact [Counseling and Psychological Services](#) at 850-474-2420.
- For 24/7 crisis counseling, call 850-474-2420 and press option 6.

All students are encouraged to use Therapy Assistance Online (TAO) to strengthen their interpersonal and coping skills, learn more about sleep and wellness, and better cope with anxiety, depression, stress management, and more. TAO is an interactive web-based self-help program that is available 24/7 and has video courses on mindfulness, relationships, anxiety, depression, and other mental health concerns. Access TAO anonymously at <http://uwf.edu/tao>.

If you feel like you need somewhere to talk anonymously to others who can support you, peer support is available to all students 24/7 via TogetherAll. TogetherAll is an online community where members are anonymous and can share how they are feeling and support each other. It is an asynchronous program where you can respond to others' posts, and you can also share your own posts if you would like. Learn more and join TogetherAll at <http://uwf.edu/togetherall>.

Mental Health is one aspect of holistic health, which encompasses all of the eight wellness dimensions. The eight dimensions do not have to be equally balanced. Instead, you should strive to achieve your own authentic personal harmony. You have unique goals, priorities, and aspirations. You determine how to live your best life. ArgoWell is a UWF campus-wide initiative that brings student wellness to the forefront. Learn how ArgoWell can help you make the healthy choice the easy choice and support you in your wellness journey at <http://uwf.edu/argowell>.

Ask-a-Librarian: UWF Library staff are available for help through our [Ask-a-Librarian Live Chat](#), monitored from 8:00 am to 11:00 pm Monday through Thursday, 8:00 am to 4:00 pm on Friday, 9:00 am to 4:00 pm on Saturday, and 9:00 am to 11:00 pm on Sunday. You can also email a librarian using the left-hand navigation in Canvas under Help or Library Tools or text a librarian at 850-483-0225.

Resources: The following resources are available to UWF students and faculty to support academic and research projects:

1. Linux servers that can be accessed to compile and execute C, C++, and Java code using an SSH client such as Putty. Detailed information on how to access the servers is provided in *eLearning* under the Content area for this course.
2. The library provides a copy of the textbook for this class that you can check out for a short period of time. Other library resources are available [here](#).
3. Cybersecurity library resources can be accessed [here](#).
4. [The Writing Lab](#) can help with the projects in this course. Graduate and undergraduate Writing Lab assistants are available to review the mechanics of writing with you and help you upgrade the quality of your papers before you submit assignments.
Note: It may take up to 48 hours or more to receive your work back from the Writing Lab. It is your responsibility to turn your assignment in on time. Take this into consideration when utilizing the Writing Lab.
5. Canvas Support Hotline (Open 24/7) - 1-844-866-3349
UWF ITS Help Desk - 1-850-474-2075 or email itshelpdesk@uwf.edu.
6. Tutoring and Learning Resources offers free services designed to help you improve your academic performance. Available services include Course-Based Tutoring, Study Skills Assistance, Academic Coaching, Academic Success Workshops, Smartpen Loans, and more. Services are available in Building 52 and the 2nd Floor of Pace Library. For more information, visit www.uwf.edu/tlr, email tutoring@uwf.edu, or call (850) 474-3176.
7. The Office of Career Development & Community Engagement (CDCE) offers resume and cover letter reviews, assistance with your job/internship search, interviewing tips, and many other services to assist you in becoming career ready, all at no cost to you! For more information, check out [Handshake](#), visit [CDCE's website](#), or call 850-474-2254

Emergency Information and Course Continuity: In the case of severe weather or another emergency, the campus might be closed and classes canceled. UWF uses a variety of

communication methods to alert the campus community about emergency situations and safety threats. [Learn more about Emergency Communications from the UWF Police.](#)

Official closures and delays are announced on the UWF website, Mobile Alert, and broadcast on WUWF-FM (88.1MHz).

- Mobile Alert is a broadcasting messaging system utilized by the university in emergency situations. To find more information regarding Mobile Alert, visit the [Enroll in Mobile Alert page](#) or locate the application in MyUWF by searching Mobile Alert.
- WUWF-FM (88.1MHz) is the official information source for the university. Any pertinent information regarding closings, cancellations, and the re-opening of campus will be broadcast.

In the event that hurricane preparation procedures are initiated, the UWF Home Web Page and MyUWF will both provide current information regarding hurricane preparation procedures, the status of classes, and the closing of the university. All students are encouraged to review the [Emergency Procedures Guide from UWF Police](#) as a quick reference for effective and timely action in the event of an emergency.

Other Course Policies

Online Resources: Please explore the UWF Online Campus Web site to familiarize yourself with online resources (e.g., tips, FAQs). In this course, we will use the *Canvas* course management system to distribute assignments and course-related resources and for topic discussions between classes.

Communication: I am available during office hours for any course-related questions you may have. For visitations outside office hours, please make an appointment with me by email. You are responsible for checking your UWF email and the *Canvas* course room to keep up with important announcements and to access class resources, assignments, etc. In general, I would encourage you to post class-related questions to the discussion board in *Canvas*, which I will regularly check to answer questions. Public discussions on topics in the class will give everyone in the class a chance to benefit from the discussions that follow your questions.

Departmental Tutoring Services: Tutors are available in the Multiplatform Lab in building 4, room 221 on the main campus. A tutoring schedule is available at the door and [here](#).

Class attendance: Attendance is required, and you will earn credit for attending class. If you miss a class due to medical or other unforeseen circumstances, you are responsible for (1) informing the instructor about your absence from the class prior to or as soon as possible after the absence and (2) obtaining notes from a classmate to make up what you have missed. You may miss class twice and still earn full credit in attendance. After missing class twice, I will deduct points from the attendance grade. Remember that you are held accountable for all assignments, whether or not the assignments were announced during an absence.

Grades: Grades will be posted in *Canvas*. It is your responsibility to ensure that the grades you receive on any assignment or test accurately reflect the grades in the electronic grade sheet in *Canvas*. For withdrawal deadlines from individual or all registered courses, please visit the UWF Academic Calendar posted by the Registrar's Office [here](#). Withdrawals after the deadline will result in a grade of *WF* or withdrawal-failing. Applying for an incomplete or *I* grade will be considered only if: (1) there are extenuating circumstances to warrant it, AND (2) you have a passing grade and have completed at least 70% of the course work, AND (3) approval of the department Chair.

Participation and feedback: I encourage active participation and regular feedback. I believe that effective communication between the instructor and students will make the course more useful, interesting, and productive. Please see me during office hours or contact me in the course discussion area if you have any questions, concerns, or suggestions! Please keep in mind that I will not provide tutoring services 24/7 via email. Use the office hours and the discussion board in *eLearning* to ask questions about the course, homework, and project assignments.

Important Note: Any changes to the syllabus or schedule made during the semester take precedence over this version.

Tentative Semester Schedule

All assignments are due Sundays at 11:00 pm as indicated in the schedule. Mark your calendar for all exams and assignments to avoid missing any deadlines.

Week	Topics	Project
1	Introduction, OS history, background, and requirements, system calls, fundamentals in programming and compilation. Chapters 1.1 – 1.10, 2.1 – 2.9, 2.11	Homework 1 due Aug. 27 th
2	Chapter 3.1 – 3.2 Processes: state, PCB, execution, contexts switch.	P1 assigned. Homework 2 due Sept 3 rd
3	Chapter 3.3 – 3.4, 3.9 Processes: fork() & exec, zombies.	Homework 3 due Sept 10 th
4	Chapter 4.1 – 4.4 Threads: creating, destroying, sharing memory.	Homework 4 due Sept 17 th
5	Chapters 4.5 – 4.7, 4.8, 5.1 – 5.3 Threads: implementation types, executions. Introduction to scheduling.	P1 due Sept 24 th , P2 assigned
6	Continue with scheduling. Review and exam.	Review, Sept. 26 th Midterm I, Sept 28 th

7	Chapter 5.4 – 5.6 Scheduling: goals, statistics, examples.	Homework 5 due Oct 8 th
8	Chapters 6.1 – 6.7, 6.10, 7.1 – 7.4, 7.6 Synchronization: locks, monitors, semaphores; critical section, condition variables.	P2 due Oct 15 th P3 assigned.
9	Continue with synchronization Chapter 8.1 – 8.9 Deadlocks and livelocks.	Homework 6 due Oct 22 nd
10	Catching up on deadlocks, livelocks. Review and exam.	Review, Oct. 24 th , Midterm II, Oct 26 th
11	Chapter 9.1 – 9.5, 9.8 Memory allocation & paging.	P3 due Nov 5 th , P4 assigned.
12	Chapter 10.1 – 10.6, 10.11 Virtual memory	Homework 7 due Nov 12 th
13	Chapters 11.1 – 11.2, 11.5 – 11.6, 13.1 – 13.4 File system I	
14	Chapter 14.1 – 14.5, 14.7 File system II	Homework 8 due Nov. 26 th
15	Chapter 3.4 – 3.8 IPC, files, pipes, I/O systems. Review	P4 due Dec 3 rd
16	Final exam Thursday, Dec 7 th , 2:00 – 4:30 pm	