

CS/SE 3377.004 Systems Programming in Unix and Other Environments

Mondays & Wednesdays 1pm-2:15pm in [ECSW 3.210](#) (MS Teams link utd.link/cs3377-jey)

Course Materials:

elearning.utdallas.edu (assignment submissions, grades, etc.)

utdallas.box.com/v/cs3377-spr22 (slides)

~jeyv/cs3377 directory in cs1.utdallas.edu (programs)

Instructor	Dr. Jey Veerasamy - MS Teams virtual office room utd.link/jey Online office hours: Mondays 3-5pm & Thursdays 12-2pm Communicate by MS Teams chat (no emails please)
TA	TBD

Course Description

CS 3377 Systems Programming in UNIX and Other Environments (3 semester credit hours)

Basic UNIX concepts, commands and utilities, organization of UNIX file system including links and access control, creating and managing UNIX processes and threads, implementing algorithms using shell scripts, basic networking concepts including socket and client-server programming, inter-process communication using pipes and signals, using a version control system to manage work, and introduction to cloud computing. Design and implementation of a comprehensive programming project is required. (Same as **SE 3377**)

Prerequisite: CS/CE 2336/2337 with a grade of C or better or equivalent.

Notes: CS 1336 (Programming Fundamentals) --> CS 1337 (Computer Science I) --> CS 2336/2337 (Computer Science II) is the sequence of programming courses offered by UT Dallas CS. So, you should have completed CS1336 & CS1337 or CS2337 in C/C++ programming and/or have a proficient programming experience with C/C++. Without prior experience in C/C++, this course will be challenging - be ready to invest additional hours for this course!

Student Learning Objectives/Outcomes

1. Ability to use Unix/Linux operating system (command line interface, shell scripting, regular expression).
2. Ability to use Unix/Linux programming environment and development tools.
3. Ability to program with Unix/Linux processes, threads, and inter-process communication facilities.
4. Ability to program with Unix/Linux file system, file input and output, and redirection.
5. Ability to develop programs for network environment (client-server model, socket programming, and cloud computing).

Required Textbooks and Materials

Both books are available online & free via [UTD Library => eBook => O'Reilly Online Learning](#) (need to login with UTD email address to access these ebooks):

1. *A Practical Guide to Linux® Commands, Editors, and Shell Programming*, 3ed. Mark G. Sobell. Prentice Hall. © 2012. ISBN-10: 0-13-308504-X. ISBN-13: 9780133085044

Note. 4ed is also available and acceptable. This book is referred as [Sobell].

Sobell source code: <http://www.sobell.com/CR3>

<https://learning.oreilly.com/library/view/practical-guide-to/9780134774626>

2. *Advanced Programming in the UNIX® Environment*, 3e. W. Richard Stevens and Stephen A. Rago. Addison-Wesley. © 2013. ISBN-10: 0-321-63773-9. ISBN-13: 9780321637734 This book is referred as [APUE].

APUE source code: <http://www.apuebook.com/code3e.html>

<https://learning.oreilly.com/library/view/advanced-programming-in/9780321638014>

TENTATIVE Academic Calendar*

Week #	TOPIC/LECTURE
1	Course Syllabus & Course Introduction. 1. Prerequisite Form 2. Unix/Linux Introduction 3. First log in to cslinux1.utdallas.edu (install mobaXterm or ssh or putty to connect cs1, etc.)
2	Unix/Linux Introduction & Commands <ul style="list-style-type: none">• Learn basic Unix/Linux Commands• Simple File editing with vi editor (Sobell Ch6)• Simple C programming with hello.c
3	Unix, Linux Commands (Advanced) File Systems (Sobell Ch4) Shell (Sobell Ch5) Makefile
4	Bourne Again Shell - Bash shell (Sobell 8, 10) Shell Script Programming with bash
5	Unix/Linux System Prog & API APUE Ch01
6	Unix File Systems and IO, and API (APUE Ch03-Ch04)
7	Pointers & Memory management Test 1 @ Testing Center - Saturday Feb 26th 9am

8	Unix/Linux Process (APUE Ch07-Ch08)
9	Spring Break
10	Shell and Signal (APUE Ch09-Ch10)
11	Thread Programming (APUE Ch11)
12	Inter-process Communication (APUE Ch11.6 & Ch15)
13	Socket Programming (APUE Ch16)
14	Socket Programming Client-Server Concurrent Server
15	Advanced Topics VCS (Git, Github, etc) Oracle VirtualBox
16	Review for Test2 Test 2 @ Testing Center - Saturday April 23rd 9am
17	Cloud Computing & advanced topics

Proctored Final Exam Procedures

If your course has a proctored exam requirement, please see the [UTD Testing Center](#) webpage and [Distance Learning Proctored Exams](#) webpage to make arrangements.

Grading Policy

Here is the standard mapping used for mapping the weighted total to letter grades in UTD. You have to earn

Course credit is only given for work assigned in the course schedule. No extra work will be assigned nor will extra credit be given for any extra work performed by a student.

Tests	30%	<p>There will be 2 tests (Test1 15% and Test2 15%)</p> <p>You need to register for your seat in the testing center to take each test. You should reserve your seat as soon as the professor asks you to do so. Each test will have ~50 randomly selected questions from a huge test bank. Please help to keep the tests as fair as possible - do not discuss the</p>
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		<p>questions with your classmates after taking your test. There will be a few bonus questions to reduce your stress 😊</p> <p>Any make-up tests will be arranged and scheduled during the same week at the discretion of the instructor. There should be a valid reason (like another class, Dr note, official off-site game participation, etc.) for scheduling make-up tests & you need to coordinate with the instructor. All other scenarios (including missing to book the slot in the testing center) will result in 20% penalty & the makeup test may be tougher than the regular one.</p> <p>Best way to prepare for the test will be to attend each class & pay attention, complete the activities and weekly assignments & get your doubts clarified in timely manner. No extra preparation is needed for the tests!</p>
Assignments	40%	<p>There will be weekly assignments due on Thursdays & they will have equal weightage – all of them together will contribute 40% to the final weighted grade. You are expected to start working on them as soon as they are posted so that you have "enough" time to work through the glitches, still manage to submit on time. Do not expect me or the TA to rescue you at the 11th hour! Late submissions will NOT be accepted. If you cannot complete an assignment due to medical condition, send the Doctor note to the professor using MS Teams chat. You will be exempted from that assignment. Additionally, one lowest score will be auto-dropped when computing the weighted total.</p> <p>Complexity level of each assignment may vary – students will be expected to spend a few hours in a computer every week. You can upload each item many times but the last submission will be graded. Late submissions will NOT be accepted. My advice is to submit whatever you have done (your best effort) before the due and/or by the due date, and to seek for any further discretion and/or consideration if you may need. All these weekly activity items should be done in Unix, Linux or Mac, and you will hand-in your projects directly in Linux.</p> <p>If the instructor believes a student has committed an act of plagiarism, student will be referred to UTD administration directly - Review utdallas.edu/conduct/integrity & utdallas.edu/conduct/manage-dishonesty for details.</p>
Activities	30%	<p>There will be 1 or 2 activities every week within a day after each class (relatively simple compared to Assignments - should not take more than 1 hour each) to ensure that you</p>

		<p>are keeping up with the class content (complete tutorials at home, finish simple exercise or take online quiz etc.) - all of them will contribute equally & together they will account for 30% of your final grade. So, you are strongly encouraged to keep up with the course every week.</p> <p>Late submissions will NOT be accepted. If you cannot complete an activity due to medical condition, send the Doctor note to the professor using MS Teams chat. You will be exempted from that activity. Additionally, two lowest scores will be auto-dropped when computing the weighted total.</p>
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Here is the standard mapping used for mapping the weighted total to letter grades in UTD. Final grade should be earned by each student! I do not plan to round up to improve your grade.

97-100	A+	94-97	A	90-94	A-
87-90	B+	84-87	B	80-84	B-
77-80	C+	74-77	C	70-74	C-
67-70	D+	64-67	D	60-64	D-
Below 60	F				

Weighted total in your gradebook shows the current weighted grade based on your graded work. For example, if you have done only 2 assignments & 2 weeks of Class work so far, current grade will be based on only those entries. So, it will continue to change throughout the semester as the items are graded.

Course & Instructor Policies

Instructor is responsible for grading all the tests. TA will be responsible for grading all weekly activity items & assignments. So, contact the TA directly using MS Teams chat for any grading related discrepancies. It is not possible to give a detailed feedback for each weekly assignment or test question due to large number of students enrolled in our classes. If you need more details/clarification, you are encouraged to meet the TA/instructor via online during office hours & get personal attention. Email is NOT preferred. If you are stuck with your assignment, it is better to turn in what you have and inform us. We will revise your submission and give some guidance. Your next submission will override the previous submission - TA will always grade the latest submission for each project. You can use MS Teams chat to get help for weekly assignments. Include the detailed problem description & applicable error messages, source files too. Do not just say "my program does not work" and expect us to figure out everything - you need to help us to help you efficiently. We expect to complete grading assignments (projects), weekly activities or quizzes, and tests in a week or so. However,

when the schedule gets too busy, it can be as long as 2 weeks before the grades are assigned. It is the students' responsibility to review the grade details when they become available and follow up for clarifications if needed.

Classroom Citizenship

Please review the UTD policy and guideline on Student behavior and conduct, academic honesty and integrity in <https://www.utdallas.edu/conduct/integrity/> and UTD BAIT team in <https://www.utd.edu/conduct/bait/>

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same: "As a Comet, I pledge honesty, integrity, and service in all that I do."

Plagiarism has NO place in the college education! UTD policies require all the professors to forward all suspicious cases to academic disciplinary committee. No exceptions. So, do not copy the code from others & do not give your code to others.

Classroom Conduct Requirements Related to Public Health Measures

UT Dallas will follow the public health and safety guidelines put forth by the Centers for Disease Control and Prevention (CDC), the Texas Department of State Health Services (DSHS), and local public health agencies that are in effect at that time during the Fall 2021 semester to the extent allowed by state governance. We strongly encourage all Comets to get vaccinated and wear face coverings as recommended by the CDC. Check the [Comets United: Latest Updates webpage](#) for the latest guidance on the University's public health measures. Comets are expected to carry out [Student Safety](#) protocols in adherence to the Comet Commitment. Everyone is expected to complete the [Required Daily Health Screening](#). Those students who do not comply will be referred to the Office of Community Standards and Conduct for disciplinary action under the [Student Code of Conduct – UTSP5003](#).

Academic Support Resources

The information contained in the following link lists the University's academic support resources for all students. Please see <http://go.utdallas.edu/academic-support-resources>.

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please go to <http://go.utdallas.edu/syllabus-policies> for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.