Online/Blended Course Syllabus

Course Information

Course Prefix, Number, Section	CS 5375.0W1
Course Title	Principles of UNIX
Term	Summer 2018

Professor Contact Information

Professor	Richard Min
Office Phone	972-883-4522
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Office Location	ECSS4.609
Online Office Hours	MW 3:30-5:30pm (or via email preferably, or by appointment)
Other Information	

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Prerequisite: CS 3335

Course Description

CS 5375 - Principles of UNIX (3 semester hours) Design and history of the UNIX operating system. Detailed study of process and file system data structures. Shell programming in UNIX. Use of process-forking functionality of UNIX to simplify complex problems. Interprocess communication and coordination. Device drivers and streams as interfaces to hardware features. TCP/IP and other UNIX inter-machine communication facilities. Prerequisite: CS 3335. (3-0) S

Student Learning Objectives/Outcomes

1. Ability to understand the history and the architecture of UNIX (kernel, shell)
2. Ability to understand and apply basic and advanced commands
3. Ability to understand and apply file management concepts
4. Ability to understand and apply process management concepts
5. Ability to understand and apply inter-process communication (signals, pipes, sockets)
6. Ability to use programming tools: editor, C/C++ compiler, debugger
7. Ability to use different scripting languages and utilities
8. Ability to learn System and Network administration principles and practices

Required Textbooks and Materials

Required Texts

1. *A Practical Guide to Linux® Commands, Editors, and Shell Programming*, Third Edition. Mark G. Sobell. Prentice Hall. © 2012. ISBN-10: 0-13-308504-X. ISBN-13: 9780133085044
   Sobell source code: http://www.sobell.com/CR3/
   https://www.safaribooksonline.com/library/view/a-practical-guide/9780133085129/
   (Available online & free via UTD Library => eBook => Safari) This book is referred as [**Sobell**].

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
APUE source code: http://www.apuebook.com/code3e.html
https://www.safaribooksonline.com/library/view/advanced-programming-in/9780321638014/
(Available online & free via UTD Library => eBook => Safari) This book is referred as [**APUE**].

3. *Unix® and Linux® System Administration Handbook*, 5ed. by Evi Nemeth; Garth Snyder; Trent R. Hein; Ben Whaley. © 2017 Prentice Hall. ISBN: 9780134278308.
https://www.safaribooksonline.com/library/view/unix-and-linux/9780134278308/
(Available online & free via UTD Library => eBook => Safari). This book is referred as [**Handbook**].

Required Materials and/or Recommended Books
(All the books are available online & free via UTD ebook Safari).

1. *Introducing Python*. Bill Lubanovic. © 2014 O'Reilly Media, Inc. ISBN-13: 978-1-4493-5936-2
(Available online & free via UTD Library => eBook => Safari) This book is referred as [**Python**].

2. *Fluent Python.* Luciano Ramalho. © 2015 O'Reilly Media, Inc. ISBN-13: 978-1-4919-4600-8 (Available online & free via UTD Library => eBook => Safari)

3. *Using SQLite*. Jay A. Kreibich. © 2010 O'Reilly Media, Inc. ISBN-13: 978-0-596-52118-9
(Available online & free via UTD Library => eBook => Safari)

4. *Learning MySQL and MariaDB*. Russell J.T. Dyer. © 2015 O'Reilly Media, Inc. ISBN-13: 978-1-4493-6290-4
(Available online & free via UTD Library => eBook => Safari)

5. *Unix Systems Programming: Communication, Concurrency, and Threads*. Kay A. Robbins; Steven Robbins. © **2003** Prentice Hall. **ISBN-10:** 0-13-042411-0. **ISBN-13:** 978-0-13-042411-2
(Available online & free via UTD Library => eBook => Safari)

6. *The Sockets Networking API: UNIX® Network Programming*. Vol 1, 3ed. W. Richard Stevens, Bill Fenner, Andrew M. Rudoff. © 2003 Addison-Wesley Professional. ISBN-10: 0-13-141155-1. ISBN-13: 978-0-13-141155-5. http://www.unpbook.com/
(Available online & free via UTD Library => eBook => Safari) This book is referred as [**Network**].

7. *TCP/IP Illustrated*, Volume 1: The Protocols, 2ed. by Kevin R. Fall and W. Richard Stevens. © 2011 Addison-Wesley Professional. ISBN-10: 0-321-33631-3. ISBN-13: 978-0-321-33631-6
(Available online & free via UTD Library => eBook => Safari)

Online Resource and Web Sites

Sobell source code: http://www.sobell.com/CR3/
APUE source code: http://www.apuebook.com/code3e.html
Computer Systems: http://www.cs.cmu.edu/afs/cs/academic/class/15213-f15/www/schedule.html
Unix Network Programming - source code: http://www.unpbook.com/
Unix Systems Programming - http://usp.cs.utsa.edu/usp/

C++ language tutorial http://www.cplusplus.com/files/tutorial.pdf
C++ tutorial http://www.learncpp.com/
C++ reference: http://cppreference.com

MobaXterm: http://mobaxterm.mobatek.net/

Putty http://www.putty.org/
Filezilla https://filezilla-project.org/

Unix/Linux commands: https://kb.iu.edu/d/afsk
Linux Shell and Commands: http://vic.gedris.org/Manual-ShellIntro/1.2/ShellIntro.pdf
POSIX Thread Programming Tutorial. https://computing.llnl.gov/tutorials/pthreads/
Thread Programming http://www.yolinux.com/TUTORIALS/LinuxTutorialPosixThreads.html
Python.org https://www.python.org/
Sqlite3 https://www.sqlite.org/

Suggested Course Materials
Suggested Readings/Texts

Suggested Materials

Textbooks and some other bookstore materials can be ordered online through Off-Campus Books http://www.offcampusbooks.com or the UT Dallas Bookstore http://www.bkstr.com/texasatdallasstore/home. They are also available in stock at both bookstores.

Technical Requirements
In addition to a confident level of computer and Internet literacy, certain minimum technical requirements must be met to enable a successful learning experience. Please review the important technical requirements http://www.utdallas.edu/elearning/students/getting-started.html#techreqs on the Getting Started with eLearning webpage http://www.utdallas.edu/elearning/students/getting-started.html.

Course Access and Navigation
The course can be accessed using the UT Dallas NetID account at: https://elearning.utdallas.edu. Please see the course access and navigation http://www.utdallas.edu/elearning/students/getting-started.html#courseaccessandnav section of the site for more information.

To become familiar with the eLearning tool, please see the Student eLearning Tutorials http://www.utdallas.edu/elearning/students/eLearningTutorialsStudents.html.

UT Dallas provides eLearning technical support 24 hours a day/7 days a week. The eLearning Support Center http://www.utdallas.edu/elearninghelp services include a toll free telephone number for immediate assistance (1-866-588-3192), email request service, and an online chat service.

Communication
This course utilizes online tools for interaction and communication. Some external communication tools such as regular email and a web conferencing tool may also be used during the semester. For more details, please visit the eLearning Tutorials webpage http://www.utdallas.edu/elearning/students/eLearningTutorialsStudents.html for video demonstrations on eLearning tools.

Student emails and discussion board messages will be answered within 3 working days under normal circumstances.

Distance Learning Student Resources
Online students have access to resources including the McDermott Library, Student Success Center (Testing Center), Academic Advising, The Office of Student AccessAbility, and many others. Please see the eLearning Current Students page http://www.utdallas.edu/elearning/students/cstudents.htm for details.

Server Unavailability or Other Technical Difficulties
The University is committed to providing a reliable learning management system to all users. However, in the event of any unexpected server outage or any unusual technical difficulty which prevents students from completing a time sensitive assessment activity, the instructor will provide an appropriate accommodation based on the situation. Students should immediately report any problems to the instructor and also contact the online eLearning Help Desk http://www.utdallas.edu/elearninghelp. The instructor and the eLearning Help Desk will work with the student to resolve any issues at the earliest possible time.

Academic Calendar*

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

Dates	TOPIC/LECTURE	READING*	ASSESSMENT Weekly Activity items (Activity, Quiz, Essay, and 2 Posts - See elearning for detail), Assignment, Test	DUE DATE
Week00 5/23-5/25	Orientation & Prerequisite Form		Week00 Activity (to sign and upload the completed prerequisite form PDF to elearning)	Activity Due
Week01 5/26-6/01	Syllabus & Course Introduction Unix/Linux Introduction & Commands • Connect to cs1 from your laptop (with MobaXterm or SSH) • Unix, Linux Commands (Basic) • Simple C programming (Hello World) • Simple file-editing with vi	Sobell Ch1-3 APUE01 Handbook08 User	Week01 Activity (to download, install and try mobaXterm or ssh or putty to connect cs1, etc.) See Week01 Activity folder in elearning for detail	Activity Due 6/01 Sat
Week02 6/02-6/08	Unix, Linux Commands (Advanced) File Systems (Sobell Ch4) Shell (Sobell Ch5) Editors (Sobell Ch6) Makefile	Sobell Ch4-6 APUE02 Handbook05 File Sys	Week02 Activity	Activity Due 6/08 Sat
Week03 6/09-6/15	Bourne & Bourne Again Shell – bash (Sobell 8, 10) Shell Script Programming with bash	Sobell Ch8, 10 APUE03 Handbook07 Shell	Week03 Activity	Activity Due 6/15 Sat
Week04 6/16-6/22	MySQL (Sobell Ch13) sqlite3 prog Python (OpenCV) Unix/Linux System Prog & API	Sobell Ch13 Sobell Ch12 APUE04	Week04 Activity Assignment1 due 6/17 M Noon	Activity Due 6/22 Sat A1 6/17 Monday Noon
Week05 6/23-6/29	Unix File Systems and IO, and API	APUE 05-06 Handbook20 Storage	Week05 Activity Test1 6/26 Wednesday	Activity Due 6/29 Sat Test1 6/26 W
Week06 6/30-7/06	Process & Signal (Basic)	APUE 07-08 Handbook04 Process	Week06 Activity	Activity Due 7/06 Sat
Week07 7/07-7/13	Process & Signal (Advanced)	APUE09-10 Handbook11 Drivers	Week07 Activity Assignment2 7/09 M Noon	Activity Due 7/13 Sat A2 7/08 Monday Noon
Week08 7/14-7/20	Thread Programming Interprocess Communication (IPC)	APUE 11-12 APUE 11.6	Week08 Activity	Activity Due 7/20 Sat

Week09 7/21-7/27	Interprocess Communication (IPC Adv) Socket Programming	APUE 15 APUE 16	Week09 Activity	Activity Due 7/27 Sat
Week10 7/28-8/03	Advanced Topics in System Admin Booting & shutdown, configuration, cloud, virtualization, (Oracle virtual box, Amazon AWS, etc.), Security,	Handbook 02,06,09,23, 24, 27.	Week10 Activity Assignment3 7/29 M Noon	Activity Due 8/03 Sat A3 7/29 Monday Noon
Week11 8/04-8/05	Last Day of Summer Class: 8/05 Final Exam Week (8/06-8/07)		Week11 Activity Test2 8/07 W	All Activity items Due by 8/05 M Test2 8/07 W
	Grade Due 8/12		Student course evaluation	

Required Reading.

1. *A Practical Guide to Linux® Commands, Editors, and Shell Programming*, Third Edition. Mark G. Sobell. Prentice Hall. © 2012. ISBN-10: 0-13-308504-X. ISBN-13: 9780133085044
   Sobell source code: http://www.sobell.com/CR3/
   https://www.safaribooksonline.com/library/view/a-practical-guide/9780133085129/
   (Available online & free via UTD Library => eBook => Safari) This book is referred as [**Sobell**].

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
   APUE source code: http://www.apuebook.com/code3e.html
   https://www.safaribooksonline.com/library/view/advanced-programming-in/9780321638014/
   (Available online & free via UTD Library => eBook => Safari) This book is referred as [**APUE**].

3. *Unix® and Linux® System Administration Handbook*, 5ed. by Evi Nemeth; Garth Snyder; Trent R. Hein; Ben Whaley. © 2017 Prentice Hall. ISBN: 9780134278308.
   https://www.safaribooksonline.com/library/view/unix-and-linux/9780134278308/
   (Available online & free via UTD Library => eBook => Safari). This book is referred as [**Handbook**].

Proctored Final Exam Procedures

If your course has a proctored exam requirement, please see the Student Success Center Proctored Exam website http://www.utdallas.edu/studentsuccess/testingcenter/proctored_exams/index.html to make arrangements.

[Note: There are three scheduled tests at Student Success Center. See the detail below.]

Grading Policy

Letter grades will be assigned as follows:

		95-100	A	90-94.999	A-
87-89.999	B+	83-86.999	B	80-82 .999	B-
77-79.999	C+	73-76.999	C	Below 73	F

Note: Each range shown above is inclusive and without any rounding-off. For example, 93-97 for grade A is for the score falling in the range between 93.000 and 97.999. The grade of 92.999 is for A-.

Note: In elearning, "Running" total in your gradebook shows the current weighted grade based on your graded work only based on what you have submitted and graded. For example, if you have done only Test1, Assignment1, Weekly postings so far (but you have missed Test2 and missed Assignment2 totally), current total grade will be based on only those entries that you have submitted and done.

Course credit is given only for the work assigned in the course schedule. The final grade will be computed as follows:

Test1,2	40%	There will be two tests (20% +20%). Online and open-book. Each test will last for 2-3 hours and will be conducted online, open-book (open book and open notes) but all should be done by individual. No cooperation or collaboration is permitted. You will have a window of a few days to start and complete the test. Once started, you must complete the test given the time-limit and duration. After the time expires, the test will be automatically submitted. All tests are open book and open notes. The details will be posted via elearning before each test, for the coverage, sample problems, duration of the test (1 or 2 hours, etc.), and the test window when the test is available for you to take the test earliest to the latest, etc.
Assignment 1,2,3	45%	3 Assignments contributing 15% each. You can ask for clarifications and help in the **Assignments** forum. If you need help with your code, it is ok to post 1 or 2 lines of code, but do not post your full program - email it to TA or professor instead. You are expected to start working on them as soon as they are posted. Do not expect us to rescue you on the day of submission. No late submission is accepted. I encourage everyone to submit the assignments 1 or 2 days early (as you may upload yours as many times as you like and the last submission will be graded). This (assignment) should be your own work done individually. Do not share or post your own work in anyway (e.g., Internet posting, Github, Cloud or Google, etc.). If one part of the assignment is to write a paper, you submit the paper to Turnitin where overall 20% similarity may result in a failing grade and for plagiarism. To score up, your paper should be: (1) a good summary (of what the author says) for a review, (2) your reflection on it, and then (3) with

		respect to this course (Unix, Operating Systems, Systems Programming or Administration, Tools and Utilities, API, etc.).
Weekly Activities & Online Participation	15%	Weekly Activity items of (1) Weekly Activity, (2) Weekly Quiz, (3) Weekly Essay, and (4) Weekly Posting [Discussion Board]). Weekly Posting. 2 meaningful Discussion Posts are required every week in **weekly discussion** (posting) forums. No late submission is accepted. This is extremely crucial component of a true online course. One-liners saying "Thanks!" or "Weather is bad" etc. will not count towards participation. Your post can be a good question, meaningful and valuable response to another student's question, interesting observation, etc. Be positive, constructive, encouraging, contributing, supportive, engaged, and proactive. Before posting a simple or naïve question, do your homework (e.g., searching via google or reading the books). In simple words, each post should value to the course. Instructor/TA will grade the weekly forum and determine the value of each post - instructor's decision is final. First post should be submitted latest by Wednesday 11:59pm and 2nd post should be completed latest by Saturday 11:59pm (CST – Dallas time), otherwise respective posts won't receive any grade. It is possible for someone to be a silent observer in on-ground course and still manage to get the final grade of A. It is impossible to do it in online course.
		Weekly Activity Weekly activity will be posted by Monday (each week) & will be due to the following Saturday 11:59pm. It may be a small programming exercise, a quiz, reading a paper and writing an essay, or some other assignment as well. It may vary each week. Late submissions are NOT accepted for weekly activities. Open book and open notes but all should be done by individual.
		Weekly Essay Weekly Essay will be posted by Monday (each week) & will be due to the following Saturday 11:59pm. This is an activity of reading a paper and writing an essay of your understanding or reflection. It may vary each week. Late submissions are NOT accepted for weekly activities. Open book and open notes but all should be done by individual.
		Weekly Quiz Weekly Quiz will be posted by Monday (each week) & will be due to the following Saturday 11:59pm.

		This is a quiz covering the topics of the study for the week or the review of what is studied. It may vary each week and all open-book. Late submissions are NOT accepted for weekly activities. Open book and open notes but all should be done by individual.

Gentle Reminder & Warning:

(1) Do not post any of your work or any materials from/of this course, including your quiz, assignment, test, program, lessons, etc. to Internet or any publicly accessible places (including cloud, github, google, etc.).
(2) Each graded material should be done individually.
(3) Any indication of a plagiarism (especially in research paper) may result in a failing grade for the work-part and/or the course. We do have 0-tolerance on plagiarism.

Note on Tests, Assignments/Project, and Weekly Activities/Postings.

** The course materials of this course are provided for **Individual** use only and for **this course use** only. Do not share or distribute any of the course materials (ppt, video, quiz, handout, etc). Do not post or make it (all or in part) available or accessible via Internet, Git, quizlet.com, Youtube, google, box, etc.

Warning. To get A- or above (in letter grade), student should complete and submit all of the assignments and get over 60% for each assignment. To get B- or above, student should complete all the assignments and submit at least 30% for each assignment.

An instructor who believes a student has committed an act of **plagiarism** should take appropriate action, which includes the issuing of a “penalty grade” (that is, F for the course) for academic dishonesty. For any "minor" plagiarism charge, the maximum letter grade for the course would be B+ or lower.

Course Policies

Instructor is responsible for grading all the tests & weekly participation. TA will be responsible for grading projects and weekly assignments. So, contact the TA directly for any grading related discrepancies for programs. It is not possible to give a detailed feedback for each project/weekly assignment/test question due to large # of students in our classes. If you need more details/clarification, you are encouraged to meet the TA/instructor during office hours & get personal attention. Do not rely on email alone to get the full response. If you are stuck with your assignment, it is better to turn in what you have and send us email. 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 email to get help for weekly assignments. Include the detailed problem description & applicable error messages, zip all your source files and include it with your email 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.

Attendance. For in-class course (and especially for online course: it will be tracked and assessed via your weekly activity, quiz, essay, and weekly postings, counted as your weekly class-participation via elearning), Attendance Rule & Policy: Please note that if you miss any lectures beyond the 1st week, then automatic actions kick in:
(1) Missing the next lecture in the 2nd week will result in an automatic drop of one grade from your final course

grade. (2) Missing the entire 2nd week of lecture(s) is an automatic F in the course. So if you are going to miss more than one week of classes (ideally, you should not miss any lecture, but sometimes people switch courses during the first week), then you should not be in the course and you should drop out. Further you should plan to be here for Final Examination Week, as it will be scheduled for this course.

Course Policies

Make-up exams

Any make-up tests will be scheduled during the same week (usually Monday or Tuesday prior to the actual test date) at the discretion of the instructor. There should be a valid reason for scheduling make-up tests & they need to be coordinated with the instructor, 1-2 weeks prior to the test date except for serious medical condition (with Doctor's or Hospital's certificate will be required as a valid proof.) Without any valid reason, there will be 20% penalty for any makeup test after the scheduled test date.

Makeup Policy

No makeup work will be allowed except for serious medical condition except for serious medical condition (with Doctor's or Hospital's certificate will be required as a valid proof.)

Extra Credit

Late Work
All the works should be done by the due and no late work is accepted.

Special Assignments

Class Participation
For all in-class courses, the attendance is required for each class, tests and demo. For online-course, each weekly activity will be counted as your attendance.

Classroom Citizenship

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."

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.

Acknowledgment. Many thanks to Dr. Jey Veersamy who provided many materials and supported this online course possible, Dr. Mark Nelson, and to Dr. Korn.

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