

CMSC 340: Linux Systems Administration (3 credits) Fall 2016

Course Web Site: <http://marmorstein.org/~robert/Fall2016/cs340.html>

Instructor: Robert Marmorstein, 395-2185, marmorsteinrm@longwood.edu

Lecture: 12:30pm-1:45pm TR, Ruffner 352 (or the Hardy House)

Office Hours:

Monday/Wednesday/Friday: 2:00pm-3:00pm

Tuesday: 3:15-4:15pm

Thursday: 3:00pm-4:15pm

I am also available by appointment (please e-mail me at least 24 hours in advance).

Course Description:

A hands-on approach to use and administration of Linux-based operating systems. Emphasizes file systems, process management, account management, software patching and maintenance, text manipulation, and the use of scripts to automate administrative tasks.

Prerequisite:

CMSC 162 or permission of instructor.

Course Objectives:

The student will:

1. learn to install, configure, and maintain a Linux system
2. discover advanced features of the Vim text editor
3. develop proficiency using system tools for software development and system maintenance
4. write small scripts and utilities using BASH

Textbook:

We will be using two books in this course. The first book is "Unix Shell Programming" by Lowell Jay Arthur and Ted Burns, Fourth Edition, ISBN: 978-0471168942. The second book is "LPI Linux Essentials Certification All-in-One Exam Guide" by Robb Tracy, April 2013, McGraw-Hill, ISBN: 978-0-071-81101-9.

We will also be using several free on-line resources and the UNIX Programmer's Manual (accessed via the "man" command). Be sure to check the course web site for links to other materials.

Course Requirements:

Your grade in this course will be determined by completion of laboratory projects, homework assignments, quizzes, and the final exam. The projects will count for 50% of your grade. The homework assignments and quizzes will count for an additional 35% of your grade. A participation grade will count for 5% of your grade. The remaining 10% of your grade will be determined by your score on the final exam. There is no midterm exam for this course.

Grading Policy:

Late work will not be accepted unless you have a medical condition or family emergency which prevents you from completing the assignment on time. However, I allot three slip days at the beginning of the semester which you may use to extend the due date of one or more homework or lab assignments.

In the event of a medical or family emergency, you do not need a doctor's note, but you must contact me by e-mail as soon as possible to arrange an extension. In such cases, I may, at my option, extend the due date on the project or grant you additional slip days.

Grading Scale:

Letter grades will be assigned using the following scale. Note that there is no grade of D- in this class.

	A: 91-100	A-: 90
B+: 89	B: 81-88	B-: 80
C+: 79	C: 71-78	C-: 70
D+: 69	D: 64-68	F: Below 64

Attendance:

I expect you to attend class unless you are sick or engaged in a school sponsored sports event or extra-curricular activity. I will rely on your honor to enforce the attendance policy. In accordance with Longwood policy, missing more than 10% of scheduled class time to unexcused absences may result in loss of one letter grade. Missing more than 25% of class (whether excused or unexcused absences) may, at my discretion, result in a failing grade.

Food and Drink:

I prefer that you do not eat in class (it distracts me and the other students). You may bring water or other non-alcoholic beverages to class. I occasionally make exceptions to this rule for students who would otherwise miss a meal or who have medical needs. If you feel that you need such an exception, you **MUST** make arrangements with me before you bring food to class. Violations of this policy will be considered an unexcused absence.

Cell Phones and Laptops:

Cell phones and laptops must be turned off and put away during lecture, unless I have specifically requested, usually by e-mail, that you bring them to class (e.g. for a lab day). Violations of this policy will be considered an unexcused absence.

Honor Code:

I take the honor code seriously in my classes. Students suspected of an honor code violation will be taken before the honor board. A student convicted of an honor offense will receive an F in the course in addition to any penalties imposed by the honor board.

All work in this class should be considered pledged, whether or not you have written the pledge on it.

Tests and quizzes must be completed entirely on your own and will be taken closed-book and closed-notes.

You *may* discuss homework problems and laboratory projects with other students subject to the following restrictions:

1. You must acknowledge any help you receive, including any discussion of the homework problems, by leaving a short note at the top of the assignment, or in the case of a project, placing appropriate comments in the code at the location where you received help.
2. Your submitted work must consist entirely of *your own answers in your own words* which you have typed or written yourself. You may discuss assignments verbally with other students, but do not share code or answers electronically.
3. Do not simply copy answers from other students. You can discuss the general approach to an assignment and you can help other students find syntax errors in their code, but any block of code longer than three lines should be entirely your own work.
4. Use of the Internet is subject to the same guidelines. You may use web sites as a general reference, but you may not copy answers from them. You must properly cite any resource you use.

Tentative Course Schedule:

Week 1: Aug. 23 - 25

Introduction, The Linux Command Line
History, Jobs, Shell Commands, Filenames
Files, Directories, Permissions, Redirection, Pipes, and Filters
Read Ch. 2 of Arthur & Burns

Aug. 29

Last day of Add/Drop (by 5pm)

Week 2: Aug. 30 - Sept. 1

Vim: Modes, Movement and Selection, Searching
Buffers and Swapfiles, Copy/Paste
Read Ch. 5 of Linux Essentials
Start "A byte of vim" (see course web site)
Lab 1: VIM

Week 3: Sept. 6 – 8	Advanced Vim: Undo/Redo, Folds, Windows and Tabs, Scripting Finish “A byte of vim”
Week 4: Sept. 13 – 15	Makefiles, Git and Source Control, Gdb and Valgrind Static Analysis, splint, indent, strace Lab 2: Git
Week 5: Sept. 20 – 22	Data Selection, Text Transformation, Shell Commands Regular Expressions, grep, sed, and awk Read Ch. 7 of Linux Essentials Read Ch. 3 of Arthur and Burns
Week 6: Sept. 27	Linux Installation, Partitioning, Filesystems Read Ch. 6 of Linux Essentials Lab 3: Linux Installation
Sept. 29 – Oct. 5	Fall Break: No Class
Week 7: Oct. 7	Software Installation, User Management, Passwords, Printing System Updates Read Ch. 8 of Linux Essentials
Week 8: Oct. 11 – 13	Using the autotools, Configuring/Compiling the Linux Kernel Read Ch. 9 of Linux Essentials
Oct. 14	Deadline to Withdraw (by 5pm)
Week 9: Oct. 18 – 20	Networking and File Sharing, NFS Firewalls and Security Read Ch. 13 of Linux Essentials Lab 4: Networking
Week 10: Oct. 25 – 27	Web and Mail Servers, SSL, Virtual Hosting, Web Authentication Lab 5: LAMP
Week 11: Nov. 1 – 3	Backups and Archives, Logging and Log Files, Cron Jobs Read Chapters 10-11 of Linux Essentials
Week 12: Nov. 8 – 10	Shell Variables, Quoting, Comparisons, Expressions, Arithmetic Loops, and Control Structures Read Ch. 5-6 of Arthur and Burns Lab 6: Scripts
Week 13: Nov. 15 – 18	Shell functions Shell Input, Data Selection, Reporting Read Ch. 7-8 of Arthur and Burns
Week 14: Nov. 22	Catchup and Review
Nov. 23-25	Thanksgiving Break: No Class
Week 15: Nov. 29 – Dec. 1	Catchup and Review
Dec. 8	Final Exam (Thursday, 3:00pm - 5:30pm)