#### CS140U: Fundamentals of UNIX/Linux



(Latest update: 31 Mar 2019)

* 4 Credits
* Grading: A-F
* Computer Lab **MKH-105**
* CRN 40616, TR 1400-1620

#### Instructor: Parker Swanson

##### How to contact me:

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**Course Description**:

* "A laboratory-intensive course which provides new users with an introduction to the Linux(r) operating system. Students will install and administer their own Linux(r) systems, primarily using professional command-line tools. Topics will include file system navigation and permissions, text editors, shell scripting and network-oriented utilities."

Prerequisities:

* MTH 095 Intermediate Algebra
* CIS 151 Networking Essentials
* (both with a minimum "C" grade)
* (or equivalents as determined by interview with instructor)

*This is the second year we've based the course on the very-popular (over 10 million sold so far) tiny computer called a Raspberry Pi. You'll use it in class (in MKH-105), and then take it home where you can connect it up and get familiar with this Linux-based, surprisingly capable little machine. We'll discuss details as we go along. There's no required textbook for the course, but your "RPi" is "required materials" (in case the people helping fund your coursework ask). The following kit is highly recommended, and is an excellent deal in our LBCC Campus Store for $80. It's available on-line from the supplier for $80 plus shipping, but why wait for shipping when you can get it at LBCC?*[*https://www.canakit.com/raspberry-pi-3-model-b-plus-starter-kit.html*](https://www.canakit.com/raspberry-pi-3-model-b-plus-starter-kit.html) *Some people have asked if some other RPi configuration would do. The answer is: probably Yes for CS140U's relatively limited objectives (we'll work mainly on the command line) - but of course I can't promise that. The kit recommended above is a relatively new and pretty powerful RPi version with high-quality essential accessories and a 32GB SD card (which is about the largest that a RPi can easily handle). In class, you'll use your kit's HDMI cable to connect it to a HDMI monitor, USB keyboard and mouse. We'll connect to the outside world via the LBCC open Wifi network. At home, you can use WiFi or Ethernet, USB or Bluetooth keyboard and mouse, and a HDMI monitor or, with an inexpensive adapter, a DVI monitor. (VGA adapters that actually work are about $16: more details on request). As you can guess, my ulterior motive in CS140U is to get you "hooked" on Linux, the RPi, and "embedded" computers in general. (Yes, I have also taught courses based on Arduino, in our LBCC Physics Department.)*

##### There is no "required" textbook for this course. Instead, we'll be referring to a *LOT* of on-line help!

##### A recommended reference textbook*:*

* ***The Linux Command Line, a Complete Introduction***
	+ by William E. Shotts
	+ Published by No-Starch Press, 2012
	+ **ISBN-13: 978-1-59327-389-7**
	+ ***Note: the book above is the hardcopy version of the free .pdf downloadable from***
		- [***http://linuxcommand.org/tlcl.php***](http://linuxcommand.org/tlcl.php)
	+ ***Or from the "Reference" "Topic" of our Moodle site***

##### More books recommended:

* **A *few* more reference books about Linux:**
	+ **Linux+ Guide to Linux Certification**
		- This was the required text for CS140U in 2012
		- It's expensive if new, but you may be able to pick up
		a used copy for little or nothing...
		- by Jason W. Eckert
		- Published by Course Technology
		- ISBN-13: 978-1-4188-3721-1
		- The CD that came with the book is pretty useless...
	+ **Running Linux**
	(published by O'Reilly)
	+ **Linux in a Nutshell (an expanded hardcopy version of selected man pages)**
	(published by O'Reilly)
	+ **Unix Power Tools (maybe more than first-level, but a classic)**
	(published by O'Reilly)
	+ and ***many*** more!!
* **A few recommended, more-advanced reference books:**
	+ **Learning the bash Shell**
		- by Cameron Newham
		- Published by O'Reilly, 2005
		- ISBN 0-596-00965-8
	+ **Essential System Administration**
		- by Aileen Frisch
		- Published by O'Reilly, 2002
		- ISBN 0-596-00343-9
	+ **Linux Network Administrator's Guide**
		- by Tony Bautts, et al.
		- Published by O'Reilly, 2005
		- ISBN 0-596-00548-2
	+ **TCP/IP Network Administration, 3rd Edition**
		- by Craig Hunt
		- Published by O'Reilly, 2002
		- ISBN 0-596-00297-1
	+ **Linux Server Security, 2nd Edition**
		- by Michael D. Bauer
		- Published by O'Reilly, 2005
		- ISBN 0-596-00670-5
		- [One of my favorite books]
	+ **Either or both of the following texts:**
		- **DNS and BIND, 5th Edition**
			* by Cricket Liu, et al.
			* Published by O'Reilly, 2006
			* ISBN 0-596-10057-4
		- **The Concise Guide to DNS and BIND**
			* by Nicolai Langfeldt
			* Published by Que, 2000
			* ISBN 0-7897-2273-9
	+ **Using Samba, 3rd Edition**
		- by Robert Eckstein, et al.
		- Published by O'Reilly, 2007
		- ISBN 0-596-00769-8
	+ **LDAP System Administration**
		- by Gerald Carter
		- Published by O'Reilly, 2003
		- ISBN 1-56592-491-6
	+ A highly recommended on-line resource: [**http://safari.oreilly.com**](http://safari.oreilly.com/)
		- Many excellent technical books available to read on-line, from O'Reilly and other publishers
		- A basic subscription is ~$15/month, with upgrades available

Other resources will be posted on this ***Moodle*** WebSite.

As stated in the **Course Description,**, CS140U is intended to be:
**"A laboratory-intensive course ..."**
We will try to maximize the amount of useful hands-on experience that we gain during the course. At the same time, we will try to minimize the amount of "busy-work", "cramming", and "catch-up". *(In fact, as you will read below, "cramming" and "catch-up" are not possible in this course!)*

**Course Credit:**

|  |  |
| --- | --- |
| **Thoughtful attendance at each class session***[See note below]* | 40% |
| In-Class work: hands-on work accomplished in-person in class, reported and submitted on time to the designated weekly "In-Class Assignment" on our Moodle WebSite. During some classes we'll conduct "quiz" exercises which will take the place of reports of in-class work, so our "quiz" exercises, with attendance, amount to 50% of your CS140U grade. *[See note below]* | 10% |
| Out-of-class work: study and at-home hands-on work with Linux, thoughtfully reported and submitted on time to the designated weekly "Out-of-Class Assignment" on our Moodle WebSite. | 10% |
| Student-led demo of a Linux distribution or application *[See note below]* | 40% |
| **Total** | **100%** |

A=90-100%, B=80-89%, C=70-79%, D=60-69%, and F=0-59%

* *Notes:*
	+ *As indicated, your regular class attendance and participation are expected and are part of your grade. Excused absences are readily granted in cases of illness or off-campus obligations. (You can view your record of attendance and excused absences on this* ***Moodle*** *site.) During some classes we'll conduct "quiz" exercises which will take the place of reports of in-class work, so our "quiz" exercises, with attendance, amount to 50% of your CS140U grade. "Quiz" exercises remain posted after they are conducted, so they can be made up.*
	+ *As described below, there are two parts to your project/demo:*
	+ *Posting a preliminary choice of topic. This is to be done by Thu 09 May 2019, but I can be somewhat flexible. This posting counts for 5% of your CS140U grade.*
	+ *In-person presentation of your project during Weeks 10 and 11. This part of the project counts for 35% of your CS140U grade.*
	+ *Any questions about the points above, please ask.* ***Thanks for all your good enthusiastic work in our CS140U class!***
* **In-class hands-on lab work:**

As stated above, we will spend as much of our course time as possible doing hands-on lab work.

Note: It's recognized that students enter CS140U with widely-varying levels of familiarity and skill using Linux. This note is to encourage collaboration and mutual help among you. In this class, it's not wrong to ask for help or to give it to a classmate - it's right! Mutual help is strongly encouraged, and will be rewarded at grading time.

Students are expected to be present and fully involved for each entire class session; the instructor will note attendance at both the beginning and the end of each day's class session. Each day, the instructor will describe appropriate activities chosen from the topics discussed in our textbook and elsewhere. You are expected to take good notes of your in-class work, and to submit a brief but thoughtful writeup of your results (good or bad!) in the designated In-Class Assignment of our Moodle WebSite. Full participation as recorded and posted will earn full credit for that week's in-class work.

Out-of-class work:

You can't learn CS140U just in class! Students are *strongly encouraged* to learn by experimenting with Linux at home. ***You will all have your own Raspberry Pi for this purpose!*** For those interested, suggestions for installing Linux as a dual-boot OS with Windows have been posted and will be updated on the course Moodle WebSite. As an alternative, I would encourage you to use VirtualBox or VMWare Server to set up one or more Virtual Machines. ***Note, however, that neither the instructor nor LBCC can be responsible for possible loss of data or other inconvenience which may result from students' experimenting with their own computers. This caution applies even if the advice given to students turns out to be wrong. Sorry!***

As indicated above, you are ***strongly*** encouraged to use Linux outside of class. You have a good deal of freedom about what you will do with it there. For example, the instructor may suggest appropriate topics to study and activities to do outside of class. Alternatively, you may find other worthwhile topics to explore (including preparing for your demo activity which you will present to the class during the 10th or 11th week of our course). Each week you will write up a thoughtful description of what you've accomplished outside of class, including results (good or bad!). Your writeup is due to be submitted to the designated Out-of-Class Assignment of our Moodle WebSite at the ***beginning*** of the designated class meeting (normally the first class meeting of the week after the assignment is given).

Demo of a Raspberry Pi or Linux application or "distro":

Linux is all about "celebrating diversity" in the world of operating systems and software. We can't possibly introduce that diversity during our in-class lectures, demos, and lab work. So - it will be up to you to help fill that need! As an important (and fun!) part of earning your credit for CIS140U, each of you will choose (in consultation with the instructor), prepare ,and present a live demo of your choice of:

* + An application for ***Raspberry P***i: It makes a **great** "embedded computer". For example, our LBCC Space Exploration Team has sent quite a few on balloons to the stratosphere at up 100,000 feet altitude, and, beyond that, into space itself!
	+ An application which runs on a Linux host, or
	+ An alternative "distro" of Linux, to help introduce us to the dozens of Lnux distributions available, many of them targeted for specialized uses. If you choose this type of demo, you'll install it in a Virtual Machine on her/his lab machine (and recommended on her/his home machine), study it, and to prepare a demonstration talk to be presented.

If you're inclined to investigate different "distros" of Linux, you may want to:

* + - * Take a deep breath.:-)
			* Hit [http://distrowatch.com](http://distrowatch.com/)
			* **(Required)** Talk with the instructor about the advantages and disadvantages of various "distros".

We'll talk a lot more during the term about the how we'll plan our demos!

There will be 2 due-dates associated with your projcet/demo. The first date, 16 May 2019, is when your selection of a topic is to be posted in the designated Forum on our Moodle WebSite, and the second date is the date during our last (10th and 11th) weeks, when you will present your demonstration talk in class. Please note that your attendance is expected at all sessions of our last (10th and 11th) weeks, regardless of which day you give your presentation.

**Class attendance:**

For legal reasons, LBCC instructors are advised to keep track of students' attendance in class. In addition to considerations of Class Participation, this is made necessary by the fact that some Student Financial Aid programs require class attendance. Instructors do not know which students may be enrolled in such Financial Aid Programs until the end of the term, at which time attendance information may be required. So the best policy, which will be followed in this course, is for the instructor to take attendance at each class meeting. Please note that your attendance is expected at sessions of our last (10th and 11th) weeks of class, regardless of which day you give your presentation.

**Academic Honesty Policy:**
All students are encouraged to discuss assignments and course materials in general terms with other students. If you need help with the exercises, you are encouraged to ask the instructor. Please note, however, that each student is expect to work independently on all assignments. The work you turn in to be graded must be *your own* work. Representing another person's work as your own constitutes academic fraud, and has no place at LBCC. No credit will be given for assignments which, in the instructor's judgment, were not created by the student submitting them.

**Skills required for success in this course:**

* + **Time management:** The ability to plan ahead, start assignments early, ask for needed help early, and submit assignments according to specifications and on time.
	+ **Patience:** The ability to look calmly at a problem, analyze how to solve it, and concentrate on its solution.
	+ **Skill in analytical and logical problem-solving:** A genuine liking for solving puzzles, and satisfaction in having done your best work to produce a solution.
	+ **A sense of humor:** Working with computers humbles a person every day. Learn not to take it personally!

**Note about cell phones in class:**
Please set your cell phone ringer to "Vibrate Only" mode before you enter the classroom. If you need to answer or place a call, please step outside the classroom while you do so.

**You should meet with your instructor during the first week of class if:**

1. **You have a documented disability and need accommodations.**
2. **Your instructor needs to know medical information about you.**
3. **You need special arrangements in the event of an emergency.**

**If you have documented your disability, remember that you must make your request for accommodations through the Center for Accessibility Resources (CFAR)**[**Online Services webpage**](https://cascade.accessiblelearning.com/LBCC/) **every term in order to receive accommodations. If you believe you may need accommodations but are not yet registered with CFAR, please visit the** [**CFAR Website**](http://www.linnbenton.edu/cfar) **for steps on how to apply for services or call 541-917-4789.**