Course Syllabus

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General info

Instructor: **Dr. A. Miner** **(http://www.cs.iastate.edu/~asminer)**

Office: Atanasoff 233

Lecture: Online only

Text (recommended): *A Practical Guide to Fedora and Red Hat Enterprise Linux*, Seventh edition, by Mark Sobell

ISBN-10: 0133477436

ISBN-13: 978-0133477436

What the course covers

This is a hands-on course designed to demonstrate the installation, administration, and utilization of the Linux operating system for a personal computer. A secondary focus of the course is on interoperability of Linux with other operating systems, including Windows and Mac. It is a three-credit course, meaning you should set aside about 3 hours per week (on average) to view the online lectures. While the emphasis is Linux, much of what is covered applies also to UNIX systems and Mac OS X.

Course objectives

The objective of this course is to provide students with an introduction to the administration of Linux systems. Upon successful completion of this course, students will be able to create a dual-boot (Windows and Linux) PC and successfully perform system and network administration tasks, such as installing packages, managing services, and creating a network of communicating Windows and Linux machines.

Student Accessibility

Iowa State University is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. Students requesting accommodations for a documented disability are required to meet with staff in Student Accessibility Services (SAS) to establish eligibility and learn about related processes. Eligible students will be provided with a Notification Letter for each course and reasonable accommodations will be arranged after timely delivery of the Notification Letter to the instructor. Students are encouraged to deliver Notification Letters as early in the semester as possible. SAS, a unit in the Dean of Students Office, is located in room 1076 Student Services Building or online at **www.sas.dso.iastate.edu** **(http://www.sas.dso.iastate.edu)**. Contact SAS by email at

accessibility@iastate.edu (mailto:accessibility@iastate.edu) or by phone at 515-294-7220 for additional information.

Prerequisites

Students are expected to have some programming experience (such as ComS 127 or 207 or 227, or CprE/SE 185), to be comfortable with some modern, GUI-based operating system, and to have experience with modern computing applications (Internet browsing, word processing, spreadsheets, etc.).

Course Topics

The following is a rough list of topics, in order of coverage, with approximate lecture time.

- OS History (1 hour)
- Primer on computer architecture (1 hour)
- Disks: architecture, filesystems (1 hour)
- Linux filesystem and file utilities (3 hours)
- Shell tricks (1 hour)
- Processes, redirection, pipes (1.5 hours)
- Filtering utilities (1.5 hours)
- Building packages (1 hour)
- The Kernel (1 hour)
- Bash programming (3 hours)
- Regular expressions (1 hour)
- AWK scripts (1.5 hours)
- SED scripts (1.5 hours)
- Networking (3.5 hours)
- File sharing with Samba (1 hour)
- Unix user accounts (1.3 hours)
- File sharing with NFS/NIS (1.2 hours)
- Network administration (1.7 hours)
- Security (2 hours)

Course Work

Homework (40%)

Homework exercises will be collected electronically. **Be sure to follow submission instructions carefully**. Unless otherwise announced, there will be an assignment due every week, on Tuesdays, for the entire semester (the first assignment is due in the second week of class). Written homework solutions should be submitted as plain ASCII text.

A majority of the homework assignments will be to modify or configure some (virtual) computer system. A typical assignment will involve downloading one or more virtual machines, configuring the machine(s) appropriately, answering a set of questions, and running a submission script that will turn in your work.

Warning: while the assignments are not *deliberately* tricky, there will be times when you get stuck. This is what the discussion forum is for. However, a frantic question posted a few minutes before an assignment is due is unlikely to receive a response in time. Thus, students are encouraged to **start assignments early**.

Exams

Exams will be offered through Canvas, and must be taken at a **test center** (http://www.elo.iastate.edu/online-testing-center/) or with an **ISU-approved proctor** (http://www.elo.iastate.edu/proctored-testing/proctored-testing-guidelines-for-proctors/). No materials, except for those provided electronically with the exam, may be used while taking an exam.

Midterms (34%)

There will be two **midterm exams**, each for one hour and each scheduled for some specific week of the semester (to be announced); you must take an exam some time during its designated week. Together, these will make up roughly 34% of your overall grade.

Final (26%)

There will be a 2-hour **final exam**, that must be taken some time during finals week. While the exam is comprehensive, it will likely emphasize material not covered on the first two exams. This is worth roughly 26% of your overall grade.

System requirements

Hardware

You will need between ten and a hundred Gigabytes of storage for virtual machines throughout the semester (possibly more, if you use your own machine and make lots of snapshots).

User accounts

There is a dedicated server, cs252.cs.iastate.edu, for collection of submitted work. You should be able to login to this server using your ISU account name and password; contact the instructor if you cannot.

Software

To use your own computer for assignments, you will need the following software.

- **VirtualBox**   **(http://www.virtualbox.org)** is the recommended software for using the virtual machines for this class, as everything has been tested on this. Other virtual machine software may or may not work; use this at your own risk.
- To connect to cs252.cs.iastate.edu from off campus, you will need **VPN access (https://www.it.iastate.edu/services/vpn)** .
- You will need a SCP client (try winscp or FileZilla), and perhaps a **SSH client (https://www.cs.iastate.edu/how-use-ssh-windows-users)** , for a few of the homework assignments.

Lateness policy

All due dates are specified in Central time. Homework solutions are due by 11:59 pm on their due date, and will be subject to a penalty based on the number of days late, as follows.

0 Days: 0% off
1 Day: 5% off
2 Days: 10% off
3 Days: 15% off
4 Days: 25% off
5 Days: 40% off
6 Days: 65% off
7 Days: 100% off

Exams are due at the specified time (usually, the end of the exam week) and will not be accepted late.

Exceptions to the lateness policy will be made, at the instructors discretion, for any University Approved reasons (generally, situations beyond the student's control, such as illness). Notifying the instructor ahead of time (e.g., for travel) works in your favor here. Students should be prepared with written documentation to justify missing an exam.

Working in groups

Students are permitted to work collaboratively, in small groups, on some homework assignments. The group will then submit a single solution in the virtual machine (with all students in the group receiving the same grade for this portion), and each student must individually submit answers to the questions (if any). Each assignment will be specified either as a *group* assignment (the maximum group size is given), or as an *individual* assignment (think of this as a maximum group size of one). Working in small groups is subject to the following restrictions.

1. You must declare the members of your small group when you submit your solution; failure to do this is considered to be a violation of the **Policy on Academic Honesty** below.
2. You may not work with the same student more than once, so plan accordingly. For example, if Alice, Bob, and Chuck form a small group for one assignment, then Alice and Bob may not work in the same group on any other assignment. Violation of this rule will result in a grade of 0 for the assignment.

3. Violating the maximum group size for an assignment will result in a grade of 0 for the assignment.

Note that working independently (as a group of one) on all assignments is an easy way to satisfy all restrictions. Also, keep in mind that **all exams are individual efforts**, so students who are carried by their small group on assignments are likely to do poorly on exams.

Policy on Academic Honesty

Students are encouraged to discuss homework assignments; there is an online discussion forum precisely for this purpose. Additionally, students are encouraged to search online for help in completing assignments, and to share URLs of sources of information. Ultimately, though, students are expected to understand and turn in their own work (or the collective work of their small group). Since the purpose of the assignments is to increase students' understanding, any activity that allows groups of students to complete a solution without understanding their own solution is prohibited. The following are some concrete examples of prohibited activities.

- Failing to declare the members of a small group, for collaborative efforts.
- Posting solutions or portions of solutions in any public forum (electronic or otherwise).
- Copying solutions or portions of solutions from another group.
- Sharing solutions or portions of solutions with other groups (electronically or via hard copies).
- Discussion to the point that submitted source code is identical.
- Submitting solutions for more than one group, from a single virtual machine.
- Collaboration **of any kind** on exams.
- Use of unauthorized materials on exams.

Of course, any amount of communication (including copying of files) is permitted *within* a small group.

Be aware that the instructor has various mechanisms in place on each virtual machine to help detect academic dishonesty, including customized shells that log all of your activity and submit this (and other) information along with your solution when you run the submission script.

Suspected cases of academic misconduct will be pursued fully in accordance with ISU policies which require that all suspected cases of academic misconduct be reported to the dean of students. Any student found responsible for academic misconduct may receive a failing grade (F) in the course (even if the student chooses to drop the course). The dean of students may impose additional sanctions (ranging from a disciplinary reprimand to expulsion from the University). Students may want to re-read the University policy on **academic dishonesty (http://catalog.iastate.edu/academic_conduct/#academicdishonestytext)** .

If you have any questions about the policy, either in general or for a specific assignment, contact the instructor.

Overall grade

The overall letter grade for the course is assigned based on the weighted total score, and the classic 10 point scale as shown in the table below. Note that the instructor reserves the right to adjust the scale, but

only in ways that benefit the students.

Score	Letter
An overall score of at least 93%	guarantees a grade of at least A
An overall score of at least 90%	guarantees a grade of at least A-
An overall score of at least 87%	guarantees a grade of at least B+
An overall score of at least 83%	guarantees a grade of at least B
An overall score of at least 80%	guarantees a grade of at least B-
An overall score of at least 77%	guarantees a grade of at least C+
An overall score of at least 73%	guarantees a grade of at least C
An overall score of at least 70%	guarantees a grade of at least C-
An overall score of at least 67%	guarantees a grade of at least D+
An overall score of at least 63%	guarantees a grade of at least D
An overall score of at least 60%	guarantees a grade of at least D-

Course Summary:

Date	Details	
Tue Aug 28, 2018	**Homework 0: The Cathedral and the Bazaar** (https://canvas.iastate.edu/courses/51546/assignments/618408)	due by 11:59pm
Tue Sep 4, 2018	**Homework 1: Create a Dual-Boot Machine** (https://canvas.iastate.edu/courses/51546/assignments/619505)	due by 11:59pm
Tue Sep 11, 2018	**Homework 2: Files and Permissions** (https://canvas.iastate.edu/courses/51546/assignments/619506)	due by 11:59pm
Tue Sep 18, 2018	**Homework 3: Buy a New Disk** (https://canvas.iastate.edu/courses/51546/assignments/619507)	due by 11:59pm
Tue Sep 25, 2018	**Homework 4: Processes** (https://canvas.iastate.edu/courses/51546/assignments/619508)	due by 11:59pm
Tue Oct 2, 2018	**Homework 5: Installing Packages** (https://canvas.iastate.edu/courses/51546/assignments/619509)	due by 11:59pm
Wed Oct 3, 2018	**Midterm exam 1** (https://canvas.iastate.edu/courses/51546/assignments/679435)	due by 11:59pm
Tue Oct 9, 2018	**Homework 6: Building Packages from Source** (https://canvas.iastate.edu/courses/51546/assignments/619510)	due by 11:59pm