

Course Name: System Administration
Course Number: CS 312
Credits: 4
Instructor name: Joseph Jess
Instructor email: joseph.jess@oregonstate.edu
Prerequisites: (CS311 or CS344) and CS372

Course Description: Introduction to system administration. Network administration and routing. Security issues. Computer, server, and network hardware. Lec/lab.

Course Content:

- Computers: hardware assembly and troubleshooting, operating system installation, booting, shutting down, user management, permissions, software troubleshooting, log files, backup methodologies, maintenance requirements and methods, registries and system files, and security.
- Networks: hardware, planning, installation, WANs & LANS, the Internet, troubleshooting, and security.
- Servers: hardware, user management, resource management, permissions, command and control, domains and groups, file systems, sharing files, system virtualization, remote management.
- Projects: Planning, estimates, client interaction and expectations, service level agreements, records management.

Measurable Student Learning Outcomes: *At the completion of the course, students will be able to...*

1. Build a functioning general-purpose computer from scratch.
2. Demonstrate how to plan, install, and troubleshoot a Local Area Network, connecting it to a Wide Area Network.
3. Demonstrate how to manage a server for the purposes of providing specific services to a collection of users and devices, including manipulation of user accounts, resource management, and security.
4. Demonstrate how to maintain a collection of devices using remote management tools in both centralized locations and across de-centralized organizations.
5. Describe how to plan major and minor tasks and time so that services are stable and effective, and meet a Service Level Agreement.
6. Produce written documentation of system problems, solutions, processes, and procedures.
7. Create programs and demonstrate facility in programs and tools that automate system administration tasks.
8. Participate effectively in a team environment

Learning Resources: All course materials will be freely available in a digital format, there is no required textbook, though I am sure to have some reading recommendations if you ask for them.

Evaluation of Student Performance: Various activities will be evaluated. Percentages are approximate.

- Weekly homework assignments (40%), from basic IP address identification to network monitoring and packet analysis for security reasons
- Weekly labs and generally a report (40%), from hardware to virtual server configuration management
- Final project (20%)

Grading Scheme: The grading scheme for this course is as follows:

93+	A
90 – 92.9	A-
87 – 89.9	B+
83 – 86.9	B
80 – 82.9	B-
77 – 79.9	C+
73 – 76.9	C
70 – 72.9	C-
67 – 69.9	D+
63 – 66.9	D
60 – 62.9	D-
0 – 59.9	F

Canvas (learning management system)

We use Canvas to manage this course where you will interact with your classmates and with your instructor. Within the course Canvas site, you will access the learning materials, such as the syllabus, class discussions, assignments, projects, and quizzes.

Student Assistance

- **Contacting the instructor** — Ed Discussion or MS Teams are the best places for asking non-personal questions about the course. For private communications, such as grade related questions, use a private Ed Discussion post, direct message us through MS Teams, or by email; email especially if you need something “in writing” or want a bit of research behind an answer: joseph.jess@oregonstate.edu
- **Technical Assistance** — If you experience computer difficulties, need help downloading a browser or plug-in, assistance logging into the course, or if you experience any errors or problems while in your online course, contact the OSU Help Desk for assistance. You can call (541) 737-3474, email osuhelpdesk@oregonstate.edu or visit the [OSU Computer Helpdesk](#) online.

Communication

Ground Rules for Online Communication & Participation:

- *Online threaded discussions* are public messages, and all writings in this area will be viewable by the entire class or assigned group members. If you prefer that only the instructor reads your communication, send it to the instructor directly by email, making sure to identify yourself and the course.
- Posting of personal contact information is discouraged (e.g. telephone numbers, address, personal website address).
- *Online Instructor Response Policy:* The instructor and TAs check email frequently and will respond to course-related questions within 72 business hours.
- *Observation of "Netiquette":* All your online communications need to be composed with fairness, honesty and tact. Spelling and grammar are very important in an online course. What you put into an online course reflects on your level of professionalism. Here are some references that discuss
 - Writing online: <http://goto.intwg.com/>
 - Netiquette: <http://www.albion.com/netiquette/corerules.html>
- Please check the Announcements area and the course syllabus before you ask general course questions. If you don't see your answer there, then contact the instructor or a TA.

(Adapted from Jean Mandernach, PSY)

Guidelines for a productive and effective online classroom

- The discussion board is your space to interact with your colleagues related to current topics or responses to your colleague's statements.
- Participate actively in the discussions, after completing the readings and carefully considering the issues.
- Pay close attention to what your classmates write in online comments. Ask clarifying questions, when appropriate. These questions are meant to probe and shed new light ... not to minimize or devalue comments.
- Think through and reread your comments before you post them.
- Assume the best about others in the class and expect the best from them.
- Value the diversity of the class. Recognize and value the experiences, abilities, and knowledge each person brings to class.
- It's OK to disagree with ideas, but do not make personal attacks.
- Be open to being challenged or confronted on your ideas or prejudices.

(Adapted from Susan Shaw, WS)

Course Policies

Late Work

You may request that homeworks or labs be granted a “Revision Grace Period”. You must notify us through the Canvas submission system by adding a comment that says “Grace Days” prior to the due date in order to receive this credit. After you have requested the grace days you may continue working on your homework or lab and be sure to submit it within 3 days of the original due date (so if it is due Tuesday night at 1159PM, then you need to get the revised submission in by Friday at 1159PM). For more sensitive questions (personal or grading) email me directly.

Incompletes

Take this course only if you plan to finish it in a timely manner (during this term). “I” or incomplete is assigned only when there is a strong and compelling case for doing so (e.g., health reasons, military commitment). An incomplete will not be assigned unless

the individual has completed over 50% of the course tasks and has a passing grade when the incomplete circumstances are encountered.

Statement Regarding Students with Disabilities

Accommodations are collaborative efforts between students, faculty and [Disability Access Services \(DAS\)](#) with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 541-737-4098.

Course Content

Note: Assignments are due before 2359 (Pacific time zone) on Tuesday the week after they are assigned so you get one more chance to ask questions about it before it is due. Submit assignments to Canvas for credit.

Unit / Week	Topics
#1: Homework #1 assigned Lab #1 is assigned	<ul style="list-style-type: none">• Syllabus,• Preview schedule,• Intro to IT and systems administration,• CPU, RAM, Motherboard, GPU, PSU, cables.
#2: Homework #1 is due Lab #1 report is due Homework #2 assigned Lab #2 is assigned	<ul style="list-style-type: none">• Storage drives, HDD formats, formatting, SSDs, MTBF, care of, volumes, partitions, filesystems,• VMs, snapshots, Virtual Box, creating and cloning VMs,• Creating VMs of Windows, Alpine, and Kali.
#3: Homework #2 is due Lab #2 report is due Homework #3 assigned Lab #3 is assigned	<ul style="list-style-type: none">• Current Windows, Mac OS overviews,• Disk management, file locations,• .dmg and .msi packages,• Installation, finding drivers, and driver installation,• Linux OS overview, file and directory descriptions in Alpine• System, installing programs and packages with yum, installing Lynx,• getting a screenshot.
#4: Homework #3 is due Lab #3 report is due Homework #4 assigned Lab #4 is assigned	<ul style="list-style-type: none">• Containers, comparison with VMs,• Docker (on Windows),• Docker with Alpine,• Dockerfiles.
#5: Homework #4 is due Lab #4 report is due Homework #5 assigned Lab #5 is assigned	<ul style="list-style-type: none">• Routers,• LAN setups,• PFSense,• Determining addresses on a LAN.
#6: Homework #5 is due Lab #5 report is due Homework #6 assigned Lab #6 is assigned	<ul style="list-style-type: none">• Windows Server,• AD, DCs, OUs, and more abbreviations,• Joining a pc to a domain.
#7: Homework #6 is due Lab #6 report is due Homework #7 assigned Lab #7 is assigned	<ul style="list-style-type: none">• DevOps, automating IT, configuration management,• Ansible,• cron and at programs.

#8: Homework #7 is due Lab #7 report is due Homework #8 assigned Lab #8 is assigned	<ul style="list-style-type: none"> • Tools of Kali, • nmap, tcpdump, dd, • Security, breaking into Windows, metasploit?
#9: Homework #8 is due Lab #8 report is due Homework #9 assigned	<ul style="list-style-type: none"> • Server technologies: RAID, UPS, notifications, environment sensors, • Backups, logfiles, and SMART tests. • The squishy stuff: customer service, project planning, management, SLAs, IT management.
#10: Homework #9 is due	<ul style="list-style-type: none"> • Network monitoring, SNMP, asset tracking, documentation, business processes, • Where to go from here: A+ certification, • Review!
#11: Finals Week	Final

Expectations for Student Conduct: Student conduct is governed by the university's policies, as explained in the [Office of Student Conduct: Information and Regulations](#).

Academic Integrity: Students are expected to comply with all regulations pertaining to academic honesty. For further information, visit [Avoiding Academic Dishonesty](#), or contact the office of Student Conduct and Mediation at 541-737-3656.

Conduct in this Online Classroom:

In an academic community, students and faculty, and staff each have responsibility for maintaining an appropriate learning environment, whether online or in the classroom. Students, faculty, and staff have the responsibility to treat each other with understanding, dignity and respect. Disrespectful behavior to others (such as harassing behavior, personal insults, inappropriate language) or disruptive behaviors in the course (such as persistent and unreasonable demands for time and attention both in and out of the classroom) is unacceptable and can result in sanctions as defined by Oregon Administrative Rules [Division 015 Student Conduct Regulations](#).

OSU Student Evaluation of Teaching

Course evaluation results are extremely important and are used to help me improve this course and the learning experience of future students. Results from the 19 multiple choice questions are tabulated anonymously and go directly to instructors and department heads. Student comments on the open-ended questions are compiled and confidentially forwarded to each instructor, per OSU procedures. The online Student Evaluation of Teaching form will be available toward the end of each term, and you will be sent instructions via ONID by the Office of Academic Programs, Assessment, and Accreditation. You will log in to "Student Online Services" to respond to the online questionnaire. The results on the form are anonymous and are not tabulated until after grades are posted.

CS312 Syllabus changelog:

1. 27 March 2020 (0001): Release version 1.0!
2. 27 March 2020 (1129): Release version 1.0.1, updated late policy to allow one late lab and one late homework.
3. 27 March 2020 (1131): Release version 1.0.2, forgot to reword midterm and final to be projects rather than exams.
4. 27 March 2020 (1138): Release version 1.0.3, reworded Learning Resources to allow for a more obvious answer to a syllabus quiz question... this is too much fun, I really do need to finish uploading labs and homeworks...
5. 30 March 2020 (1954): Release version 1.0.4, Updated order of homework and lab being due, it bothered me that these were not consistent in assign order to due order, updated headings to be more consistent, and added wording for clarification (Canvas being an LMS), wow are these heading rules all different from each other (altered several more to make the table of contents look a bit better)
6. 19 May 2020 (0821): Release 1.1, updated to remove midterm activity and distribute points over assignments and final
7. 19 May 2020 (0844): Release 1.1.1, redistribute points from final over assignments
8. 31 March 2021 (~1423): Release 1.2, update schedule to mention Alpine instead of CentOS for lightweight and prep for containers reasons