Course Syllabus

Instructor Information

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Teaching Assistants

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- Lay Patel (mailto:lpp5139@psu.edu)
- Ma Qian (mailto:qfm5033@psu.edu)
- Shai Sundar (mailto:mxs6664@psu.edu)

Grader

- Nishant Asati (mailto:nxa5283@psu.edu)

Overview and Schedule

Credits	3
Time	Monday, Wednesday, Friday: 1:25-2:15pm (Section 1), 2:30-3:20PM (Section 2), 3:35pm-4:25 (Section 3)
Location	Ag Science & Industries 101
Textbook	None

This course explores the art and methods of systems programming. Practically speaking, lectures and course assignments will provide students experience programming in C within the UNIX environment. UNIX tools will be introduced, as will the general UNIX philosophy. Use of the Linux command line will be taught to proficiency. We will examine the use of shell programs, compilers, build sequences, memory management, file systems, signal processing, parallel programming, and other topics essential to computer scientists. In addition, we will introduce students the basics of systems administration on UNIX virtual machines.

A detailed list of a lecture by lecture contents, assignments, and due dates (**subject to change as semester evolves**) is available on the Home page.

Office Hours

Instructor	Office hours	Zoom link
Sencun Zhu	Th 11am-12pm	https://psu.zoom.us/j/94157079628 (https://psu.zoom.us/j/94157079628)
Suman Saha	T 11am-12pm	https://psu.zoom.us/my/sumsaha (https://psu.zoom.us/my/sumsaha)
Shakya Chakrabarti (mailto:shakya@psu.edu)	W 9:00am-11:00AM	https://psu.zoom.us/j/99785378541 (https://psu.zoom.us/j/99785378541)
Avimita Chatterjee (mailto:amc8313@psu.edu)	W 11:00AM-1:00PM	https://psu.zoom.us/j/96351436724 (https://psu.zoom.us/j/96351436724)
Thrupti Raj Lakshmana Gowda (mailto:tzl5569@psu.edu)	M 3:00pm-5:00PM	https://psu.zoom.us/j/94401976860 (https://psu.zoom.us/j/94401976860)
Neeraj Karamchandani (mailto:njk5270@psu.edu)	Th 9:00am-11am	https://psu.zoom.us/j/96444432562 (https://psu.zoom.us/j/96444432562)
Minli Liao (mailto:mjl5868@psu.edu)	F 9am-11am	https://psu.zoom.us/j/94267952663 (https://psu.zoom.us/j/94267952663)
Ali Noureldeen (mailto:awn5175@psu.edu)		https://psu.zoom.us/j/
Lay Patel (mailto:lpp5139@psu.edu)	M 5:00-6:00pm, F 11-12	https://psu.zoom.us/j/94017239879 (https://psu.zoom.us/j/94017239879)
Ma Qian (mailto:qfm5033@psu.edu)	T 4:00pm-6:00pm	https://psu.zoom.us/j/97619360207 (https://psu.zoom.us/j/97619360207)
Shai Sundar (mailto:mxs6664@psu.edu)	T, Th, 12:00pm-1:00pm	https://psu.zoom.us/j/98358864515 (https://psu.zoom.us/j/98358864515)

Format of Meetings

This course will be taught in-person unless the university decides to switch to the online mode. There are totally three sections in the afternoons of Mondays, Wednesdays and Fridays. Students with conditions that make it difficult to wear a mask (Case 1) or need quarantine due to your own infection or your exposure to infected people (Case 2) may participate in class remotely via Zoom. For Case 1, you need to get approval from the instructors in the beginning of the semester. For Case 2, you may get one or two weeks of permissions for Zoom meetings when requested. Per university policy, we cannot open up Zoom meeting as a substitute for in-person meeting, so if your situation does not fall into either of the two cases, you will not be admitted into the Zoom room from the waiting room.

We will only record one of the three sections via Zoom throughout the semester so that students may watch the missed lectures or review the content.

The three exams are to be taken in classroom only. No online option will be offered.

Communication

We will use Canvas Announcements to broadcast general messages. Each student will be assigned to one of the TAs. For questions that are not answered elsewhere, you should always contact your TA first. If your TA cannot answer your question, then you can ask the instructors or your TA brings up the question to the instructors. Be mindful that we have over 400 students. The instructors won't have time to answer many questions.

We will be using **Piazza** (http://piazza.com/psu/spring2022/cmpsc311) for class discussions. Please be smart and don't ask questions that give away important aspects of the assignment, be nice, and search past threads to see if your question has already been asked before posting. Rules:

- Feel free to ask questions about lectures/assignments.
- Do not share your code or your program output. Use office hours to discuss your code with the course staff. Conceptual questions may generally be public (make your best judgement).
- It is okay to answer your fellow students' questions if you are confident about your answers.

Course Philosophy

System programming concerns the development of software and services used by applications and operating systems, e.g., OS functions, de-fragmenter, web-servers, databases, search tools, backup systems, etc. This course will provide information and experience required to understand, design and implement components of large and small software systems.

In general, students successfully completing the course will be able to evaluate design alternatives according to engineering best-practices, specifications, performance analysis, robustness, etc. This course will investigate one system and one programming language in detail through demonstrations, programs, programming assignments, etc. The specific system is Unix, a family of operating systems forming a complete standardized programming environment based on the idea of software tools. The specific language is C, which is widely used for operating system implementations, and which forms the basis for the C++ and Java languages studied in the prerequisite courses. This will help students understand operating system services available to application programmers, and provide a firm ground for the study of operating systems in general.

IMPORTANT: This course covers the basic skills and topics that form the foundation of later CMPSC and CMPEN courses. For this reason, it is essential that every student attend and learn the material. It will be nearly impossible for students to complete later courses in these majors without mastery of this material.

Grading

The course will be graded on exams and course projects:

Activity	Percentage
Course Projects	50%
Mid-term Exam #1	15%
Mid-term Exam #2	15%
Final Exam (time/date TBD)	20%

NOTE:

1. You must receive at least 40% of the points for the exams to pass the class.
2. You must receive at least 40% of the points for the class projects to pass the class.

Grading Scale

A	100 %	to 94.0%
A-	< 94.0 %	to 90.0%
B+	<90.0 %	to 86.0%
B	< 86.0 %	to 82.0%

B- < 82.0 % to 78.0%

C+ < 78.0 % to 72.0%

C < 72.0 % to 68.0%

D < 68.0 % to 60.0%

F < 60.0 % to 0.0%

Course Projects

The course projects require students to develop and debug system programs. The details of the projects will be made in class and through project descriptions made available on the course website.

Academic Integrity Course Policy

Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity is a basic guiding principle for all academic activity at The Pennsylvania State University, and all members of the University community are expected to act in accordance with this principle. Consistent with this expectation, the University's Code of Conduct states that all students should act with personal integrity, respect other students' dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts.

Academic integrity includes a commitment by all members of the University community not to engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty violate the fundamental ethical principles of the University community and compromise the worth of work completed by others.

The course projects are to be carried out individually. Students are explicitly not allowed to share information, source code, or even discuss the contents of the projects. Any violation of this policy will be considered cheating and will result in the student receiving an 'F' grade for the project and a full letter grade off the final grade for the course. Students with more than one violation may face stronger penalties per the university policy.

Students are forbidden from copying code, makefiles, or any other material from the Internet (such as publicly available Github repos). Plagiarism will be strictly enforced by the TAs through in-depth reviews of your submissions. Any violation in the letter or spirit of this policy will also be considered cheating, and handled as described above. Note that any publication of the assignments (e.g., via github or other system) is considered a violation of the above policy.

More information on The Department of Computer Science and Engineering's Academic Integrity Standards, which are applicable to this course, can be found at **https://www.eecs.psu.edu/students/resources/EECS-CSE-Academic-Integrity.aspx (https://www.eecs.psu.edu/students/resources/EECS-CSE-Academic-Integrity.aspx)**

Lateness Policy

Assignments are assessed a 10% per-day late penalty, up to a maximum of three days after which a zero grade will be given. No exceptions. Period. Note that the last project will not have a three day grace period.

Virtual Machines/Student Computer

As part of the course projects, every student will be required to maintain a virtual machine on a personal computer. Students are responsible for administrating and maintaining these virtual machines, and are strongly encouraged to back them up frequently.

It is the student's responsibility to have a functioning and suitably powerful computer to run their virtual machines. **Hardware or software failures are the student's responsibility, and can not be used as an excuse for late assignments**. The minimum requirements for this computer that is have 100MB free storage, 8GB memory and have a 64-bit processor. Netbooks and tablets are not suitable.

Course Prerequisites

You must have completed and passed (with a grade of C or better) the prerequisite course CMPSC 221, Object Oriented Programming with Web-Based Applications, which uses Java. You must have completed and passed (C or better) the earlier courses CMPSC 131 and 132. If, instead, you have completed and passed similar courses elsewhere, contact the instructor. Prior experience with Unix or C is not expected, but you should be very familiar with the concepts introduced in CMPSC 131 and 132, and know how to use an integrated development environment, e.g., as Microsoft's Visual Studio.

If possible, you should take CMPEN 331, Computer Organization and Design, at the same time as this course, or within one semester of it. The connection between these courses would be stronger if we could require you to take both at the same time, but that's not possible. In 331, you learn about the basics of memory organization (registers, cache, main memory, virtual memory), instruction execution, exceptions and interrupts, and the translation of procedural programming languages into machine instructions.

This is a three-credit course, and you can expect to spend a lot of time outside of class with working on the project programming. To avoid turning the programming assignments into a nightmare of unsuccessful debugging, you should recognize symptoms of confusion early, and promptly ask for help from the professors or TA. With the exception of first and second assignments, the following assignments will build on previous assignments, so incomplete or poor code will make later assignments very difficult if not impossible. For this reason, it is essential student do not get behind on the projects.

We will often give you some code as examples or as a starter kit for an assignment, and use of that material is encouraged. After that point, the programming work should be done on your own. **This will be strictly enforced.**

Course Ethics

This course considers topics involving systems. As part of this investigation we will cover technologies whose abuse may infringe on the rights of others. As an instructor, I rely on the ethical use of these technologies. Unethical use may include circumvention of existing security or privacy measurements for any purpose, or the dissemination, promotion, or exploitation of vulnerabilities of these services. Exceptions to these guidelines may occur in the process of reporting vulnerabilities through public and authoritative channels. Any activity outside the letter or spirit of these guidelines will be reported to the proper authorities and may result in dismissal from the class.

Any instance of sharing or plagiarism, copying, cheating on tests, or other disallowed behavior will constitute a breach of ethics and will result in the penalty identified above. Programming assignments must be completed without assistance or cooperation between students.

Students are responsible for reporting any violation of these rules by other students, and failure to constitutes an ethical violation that carries with it similar penalties.

When in doubt, please contact the course professor for advice. Do not undertake any action which could be perceived as technology misuse or cheating anywhere and/or under any circumstances unless you have received explicit permission from Professor Sencun Zhu or Professor Suman Saha.

Disability Accommodation

Penn State welcomes students with disabilities into the University’s educational programs. Every Penn State campus has an office for students with disabilities. Student Disability Resources (SDR) website provides contact information for every Penn State campus (http://equity.psu.edu/sdr/disability-coordinator). For further information, please visit Student Disability Resources website (http://equity.psu.edu/sdr/).

In order to receive consideration for reasonable accommodations, you must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: See documentation guidelines (http://equity.psu.edu/sdr/guidelines). If the documentation supports your request for reasonable accommodations, your campus disability services office will provide you with an accommodation letter. Please share this letter with your instructors and discuss the accommodations with them as early as possible. You must follow this process for every semester that you request accommodations.

Counseling And Psychological Services

Many students at Penn State face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients’ cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

Counseling and Psychological Services at University Park (CAPS) (http://studentaffairs.psu.edu/counseling/): 814-863-0395

Counseling and Psychological Services at Commonwealth Campuses (https://senate.psu.edu/faculty/counseling-services-at-commonwealth-campuses/)

Penn State Crisis Line (24 hours/7 days/week): 877-229-6400 Crisis Text Line (24 hours/7 days/week): Text LIONS to 741741

Educational Equity/Report Bias

Consistent with University Policy AD29, students who believe they have experienced or observed a hate crime, an act of intolerance, discrimination, or harassment that occurs at Penn State are urged to report these incidents as outlined on the University's Report Bias webpage (http://equity.psu.edu/reportbias/)

Recording of Class Sessions

Video and audio recordings of class lectures will be part of the classroom activity. The video and audio recording is used for educational use/purposes and only may be made available to all students presently enrolled in the class. For purposes where the recordings will be used in future class session/lectures, any type of identifying information will be adequately removed.

Mask Wearing Requirements

We know from existing scientific data that wearing a mask in public can help prevent the spread of COVID-19 in the community (Lyu and Wehby, 2020; CDC, 2020; Johns Hopkins Medicine, 2020). Just as you're expected to wear a shirt and shoes to class every day, everyone -- including the instructor and TAs -- are required to wear a face mask in University buildings, including classrooms and labs. You MUST wear a mask appropriately (i.e., covering both your mouth and nose) in the building if you are attending class in person.

You are not permitted to consume food or drink in classrooms, except for water. If you must drink water, please be especially conscious of maintaining social distancing and minimizing the time your mask is moved aside. Or, better yet, use a straw.

Anyone attending class in person without a mask will be asked to put one on or leave. Refusal to comply with University policies is a violation of the Student Code of Conduct. Students who refuse to wear masks appropriately may face disciplinary action for Code of Conduct violations. See details here on the Student Affairs website: (https://studentaffairs.psu.edu/support-safetyconduct/student-conduct/code-conduct)

Centers for Disease Control and Prevention. (2020, April 3) Recommendation Regarding the Use of Cloth Face Coverings, Especially in Areas of Significant Community-Based Transmission. https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover.html

Johns Hopkins Medicine. (2020, June 17) Coronavirus Face Masks & Protection FAQs. https://www.hopkinsmedicine.org/health/conditions-and-diseases/coronavirus/coronavirusface-masks-what-you-need-to-know

Lyu, W. and Wehby, G.L. (2020, June 16) Community Use Of Face Masks And COVID-19: Evidence From A Natural Experiment Of State Mandates In The US. Health Affairs. https://www.healthaffairs.org/doi/full/10.1377/hlthaff.2020.00818?url_ver=Z39.88- 2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub++0pubmed&