CSC 3304 – Sec 2: Introduction to Systems Programming – Spring 2024

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Phone: 225-578-5351 (this forward to my cell via MS Teams)

Contact: I prefer to handle most things by email, but you can drop by my office between 9am and 4pm Monday to Friday. Check with me before making a special trip. You can make an appointment by email, or even try to reach me in real-time via MS Teams (dtramm1), phone or text message. Please introduce yourself as a student in my class when contacting me.

Class Time: Tu/Th 12:00 pm to 1:20 pm

Final Exam: Tuesday, May 7, 2024, 10 am to NOON in 105 Turead Hall

Class Location: 105 Turead Hall

Prerequisites: CSC 3102 (credit or registration; credit strongly recommended!)


Textbook Errata: The 13th printing is most recent. If using an older printing, you should check the link below for known errors: https://man7.org/tlpi/errata/index.html


Evaluation
Exams (2) 30%
Final Exam 25%
Assignments 45%

Course Description: Introduction to systems programming, using the C programming language: OS command and shell basics, process creation and control, system calls, signals, concurrency and virtualization.

Course Objectives

- Develop proficiency in the C programming language
- Understand the Unix environment, command line and scripting
- Develop robust and complex programs for Unix systems
- Introduce operating system behaviors and concepts
- Understand hardware optimizations for software
Course Topics

- OS command and shell basics
- C language syntax, data types, and control flow
- C strings, pointers, and structs/unions
- C development tools - gcc, gdb, make, git for version control
- Machine-level representation of data and programs
- Buffered and unbuffered file I/O
- Memory mapped I/O
- Process creation and control
- Unix Pipes
- Signals
- Multithreaded programming
- Concurrency and Parallelism concepts
- Unix network I/O
- Socket programming with TCP and UDP
- Virtualization
- Optimizing program performance

Class Policies

Exams and Labs
There will be two regular exams plus a final exam. Exams will be announced in advance by email and in class.

Assignments:
You must compile programs directly on the classes.csc server. You may program on your own device, but the program submitted for grading must compile and run on the classes.csc server and, for full points, must compile without warnings or errors using compiler flags that I provide. You must also write with consistent and neat style, reasonably descriptive function and variable names, and frequent comments. Programs must be written in C and scripts in Bash unless I specifically state otherwise. Hand written test answers, assignments and homework must be legible.

Grading Scale:

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<th>Point Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>97 to 100.0+</td>
<td>A+</td>
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<tr>
<td>93 to 96.9</td>
<td>A</td>
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<td>90 to 92.9</td>
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<td>87 to 89.9</td>
<td>B+</td>
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<td>83 to 86.9</td>
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<td>80 to 82.9</td>
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<td>77 to 79.9</td>
<td>C+</td>
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Grading Curve: I may choose to grade on a curve and the curve may award more points to students with lower grades (although rank order will be maintained). Students with the highest grades may receive bonus points with some curves.

Attendance: Lecture attendance is expected and students are responsible for learning and understanding material from missed lectures.

Missed Labs/Tests: If you miss (or plan to miss) any test, lab or deadline, and if an acceptable excuse is presented as governed by LSU’s PS-22, I may, either delay your deadline, schedule a makeup test, or increase the percentage weight of other assignments and tests to make up for the missing work. Without a valid excuse, you should still contact me to discuss, but you may get a grade of 0 for the work per LSU policy.

Grading Disputes: When I return graded work, if you have some dispute, you have until the end of the following class period to bring the problem to my attention (in person or by email or phone), or in the case of the final, before final grades are submitted. After that, if you have a serious dispute you should still bring it to my attention and I may consider it.

Cheating: Cheating comes in many forms. The most obvious is plagiarism of answers or programs from your peers, or from the Internet. LSU policy penalizes those aiding cheaters the same as those cheating. Refer to the LSU Student Code of Conduct for more information on cheating and penalties.

Computer Account: You will be assigned an account on a Computer Science server, which will be used for writing and compiling homework assignments and sending them in for grading. Do not share your account or password with other students. If you discover any security vulnerabilities in the system, it is your duty to report it to me as soon as possible. Using any method to gain unauthorized access on the system may constitute a crime in addition to violating LSU computer policies.

Final Exam: The final exam date/time is listed on the first page of this syllabus. Check your other courses finals date and if you have 3 on one day and would like to reschedule one, initiate the process for rescheduling a final exam at the earliest opportunity. The process must be complete before the deadline (April 5 at 4:30 pm); it is not sufficient to merely submit the form by the deadline.

Other Dates: Check LSU Academic Calendar for important deadlines, holidays, etc.
LSU Policies and Statements

Equal Opportunity Environment:

LSU assures equal opportunity for all qualified persons without regard to race, creed, color, marital status, sexual orientation, gender identity, gender expression, religion, sex, national origin, age, mental or physical disability, or veteran’s status in admission to, participation in, and treatment or employment in the programs and activities that the University operates. These opportunities apply equally to teaching and learning environments within all university recognized courses, curriculum and co-curriculum programs. These policies embrace individual difference and diversity.

Diversity Statement:

The College of Engineering is committed to fostering exemplary educational opportunities that support individuals from all backgrounds, regardless of race, class, gender, ethnicity, religion, accessibility, or socioeconomic status. We recognize that LSU benefits from diverse viewpoints, experiences, and perspectives and that the promotion of inclusive excellence is key to all that we do. Becoming a university student is a significant milestone for learners, and the experience involves a new community rich in social and cultural diversity. It is the instructor’s intent that students from all backgrounds and perspectives be well served by this course and the course content and class discussions will be enhanced by the diversity of its students. It is the instructor’s intent to present materials and activities that are respectful of diversity.

Students with Disabilities:

Louisiana State University is committed to providing reasonable accommodations for all persons with disabilities. If you have a disability that may have some impact on your work in this class and for which you may require accommodations, please see a staff member in Disability Services so that such accommodations can be considered. Students that receive accommodation letters, please meet with the instructor to discuss the provisions of those accommodations as soon as possible. You may request a private and confidential meeting during office hours or at a time mutually agreed upon.

The instructor makes a best effort to provide all material in an accessible format from the start. However, the instructor is not perfect, nor do they have control over external resources. If any resources, lectures, guides, etc. provided are inaccessible, please notify the instructor promptly to remediate.

Academic Integrity:

Louisiana State University adopted the Commitment to Community in 1995 to set forth guidelines for student behavior both inside and outside of the classroom. The Commitment to Community charges students to maintain high standards of academic and personal integrity. All students are expected to read and be familiar with the LSU Code of Student Conduct and Commitment to Community. It is your responsibility as a student at LSU to know and understand the academic standards for our community. Students who are suspected of violating the Code of Conduct will be
referred to the office of Student Advocacy & Accountability. For undergraduate students, the outcome will range from failing the assignment to failing the class along with disciplinary probation. Academic misconduct includes, but is not limited to:

- Turning in work that is not your own
- Asking someone to turn in work in your absence
- Copying code from online resources when work is to be entirely one’s own
- Using code from another student when work is to be entirely one’s own
- Copying code from online resources without proper citation or credit
- Copying code from another student
- Supplying your work to another student so that they may copy it