CS 3410: Distributed Systems

Spring 2021 Syllabus

Can be used to fulfill a requirement for students pursuing a degree or emphasis in Computer Science, and open to other students. Covers design and implementation of network applications, including message passing, concurrency, synchronization, scalability, and partial failure.

Prerequisites

CS 2420 and CS 2810, each with a C- or better

Course fees

Computer lab access fee: $20, used to assist in maintaining computing infrastructure.

Sections

One section:

1. MWF 10:00 am in Smith 108
   CRN: 20853
   Final exam: TBD

Instructor

Instructor: Dr Russ Ross

Email: russ@dixie.edu

Phone: 435-652-7971 (note: email preferred)

Office: North Burns 226

Office Hours: Weekdays 1:00-2:00 pm (via Zoom)

Course learning outcomes

At the successful conclusion of this course, students will be able to:

1. Design and implement software solutions that span multiple computers across a network.
2. Analyze the tradeoffs between competing goals in system software projects, including safety, performance, convenience, and ease of future maintenance.
3. Build and modify complex software projects in teams.
4. Debate and differentiate the approaches and solutions to distributed systems problems taken by modern internet organizations.

Resources

Text

There is no text required for this course. Various online resources will be assigned throughout the semester.

Computer labs

You may use the computers in the Smith open computer lab. There will also be lab assistants in this lab.

You can also use your own personal computer, but if you do so you are on your own when it comes to installing and configuring necessary software.

Course web site

This course has an accompanying website. You are responsible for announcements, the schedule, and other
resources posted on the website. Grades will be managed using Canvas.

## Assignments and exams

### Reading

The student is responsible for reading the assigned material. A reading schedule is provided with the class schedule on the course website. Readings consist of a series of research papers, online articles, and recordings of technical talks.

Research papers can be difficult reading, so students should plan on several hours over multiple sessions to read each paper.

### Assignments

Assignments will be graded for accuracy of function and style of design. Programs that do not compile will receive no credit. It is important that you start early and get each of your assignments done before its due date. Many problems will take much longer to solve in a single sitting than in many shorter sessions. Give yourself time to think; sleep on difficult problems. Finish early so you can go back and refine your initial approach.

Assignments are due by the end of the week listed in the schedule, and must be passed off to the instructor during class time or in office hours. This means that you must reserve time to pass it off at a suitable time before the end of the day it is due.

### Final presentation

There will be no exams, but there will be a final presentation. Each student will be assignment a research paper to read and present to the entire class. Details and the schedule will be discussed in class.

### Grading

Assignments, in-class activities, and presentations each contribute to your point total. In total, the assignments comprise 60% of your grade, reading responses 25%, and the presentation counts for 15%.

Letter grades are assigned based on the percentage of possible points attained, according to the following chart:

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<th>Minimum Percentage</th>
<th>Letter Grade</th>
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<td>93</td>
<td>A</td>
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<tr>
<td>90</td>
<td>A-</td>
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### Course policies

#### Attendance

Students are responsible for material covered and announcements made in class. School-related absences may be made up only if prior arrangements are made. The class schedule presented is approximate. The instructor reserves the right to modify the schedule according to class needs. Changes will be announced in class. Exams and quizzes cannot be made up unless arrangements are made prior to the scheduled time.

Occasional absences are acceptable as long as the student keeps up with assignment work. Students who miss more than two consecutive weeks of class or who miss more than 20% of scheduled classes during the semester without making prior arrangements will receive a failing grade. Students who miss any scheduled
exam (including midterm exams and the final exam) or fail to complete a final project without making prior arrangements will receive a failing grade.

This course can only be completed by attending classes and completing all assigned work to a satisfactory level. There is no procedure for testing out of the class.

Laptops

Electronics—including laptops—in class have been demonstrated to have a negative impact on student learning (see Shriram Krishnamurthi's writeup for background). This class has a NO DISTRACTIONS policy, with a few exceptions:

1. When I ask you to use your laptop (or phone) for a specific activity in class. In this case you are permitted to use it for the duration of the activity, but not during the rest of the class.
2. If you need a laptop to accommodate a disability. If this is the case, please talk to me in advance and please visit the Disability Resource Center to document your need. To help other students in the class, please sit near one of the edges so your laptop does not distract other students more than necessary.

This policy extends to phones, tablets, and other electronic devices. I encourage you to pay full attention to class and take notes on paper.

Time Commitment

Courses should require about 45 hours of work per credit hour of class. This class will require about 135 hours of work on the part of the student to achieve a passing grade, which is approximately 9 hours per week. If you do not have the time to spend on this course, you should probably rethink your schedule.

Late Policy

Response papers are due before class starts on the day we are scheduled to discuss the paper. No late work is accepted for response papers.

The lateness policy of this course is designed to encourage students to stay up-to-date on the current topics and assignments. Each assignment has a soft due date (when students are expected to complete it) and a cutoff date (after which submissions are no longer accepted).

Assignments may be made up after the cutoff date, subject to the following constraints:

1. No old assignments are accepted until the current, active assignment is complete. Students should focus on the current projects, instructional materials, and in-class activities, and only go back to work on older assignments when they are fully caught up or even ahead on current assignments.
2. Old assignments (anything accepted after the initial cutoff date) will be subject to a 15% penalty.

Collaboration

Limited collaboration with other students in the course is permitted. Students may seek help learning concepts and developing programming skills from whatever sources they have available, and are encouraged to do so. Collaboration on assignments, however, must be confined to course instructors, lab assistants, and other students in the course. Students are free to discuss strategies for solving programming assignments with each other, but this must not extend to the level of programming code. Each student must code his/her own solution to each assignment. See the section on cheating.

Cheating

Cheating will not be tolerated, and will result in a failing grade for the students involved as well as possible disciplinary action from the college. Cheating includes, but is not limited to, turning in homework assignments that are not the student’s own work. It is okay to seek help from others and from reference materials, but only if you learn the material. As a general rule, if you cannot delete your assignment, start over, and re-create it successfully without further help, then your homework is not considered your own work.

You are encouraged to work in groups while studying for tests, discussing class lectures, discussing algorithms for homework solutions, and helping each other identify errors in your homework solutions. If you are unsure if collaboration is appropriate, contact the instructor. Also, note exactly what you did. If your actions are determined to be inappropriate, the response will be much more favorable if you are honest and complete in your disclosure.
Where collaboration is permitted, each student must still create and type in his/her own solution. Any kind of copying and pasting is not okay. If you need help understanding concepts, get it from the instructor or fellow classmates, but never copy another’s code or written work, either electronically or visually. The line between collaborating and cheating is generally one of language: talking about solutions in English or other natural languages is usually okay, while discussions that take place in programming languages are usually not okay. It is a good idea to wait at least 30 minutes after any discussion to start your independent write-up. This will help you commit what you have learned to long-term memory as well as help to avoid crossing the line to cheating.

**Special COVID-19 policies**

All students attending class in person must wear a face covering that covers both mouth and nose for the entire class period and when working in the Smith Computing Center or visiting faculty offices. This is a state requirement, a university requirement, and a course requirement. Students who can not or will not wear a mask should stay off campus and attend class remotely. Any student attending class in person and refusing to wear a mask properly will receive a failing grade for the class and will not be permitted to continue.

If and when you attend class remotely and synchronously, you must turn on your video camera and give your full attention to the class just as you would in person. You may use an altered background image if you prefer for privacy.

**College policies**

Click on this link: [https://calendar.dixie.edu/](https://calendar.dixie.edu/) for the official academic calendar, which has several important dates you should be aware of.

Click on this link: [https://employees.dixie.edu/faculty-resources/required-elements-in-dsu-syllabi/](https://employees.dixie.edu/faculty-resources/required-elements-in-dsu-syllabi/) and scroll down to the section starting with “Important Links” for links to resources and policies that apply university wide.