

CSC 210 Software Development

University of Arizona, Fall 2023 Syllabus

Official Course Description: An introduction to the development of large scale software. Topics include modularization, design patterns, documentation, unit testing, source code control, build systems, debuggers, and performance tuning; all of the tools necessary for developing software as opposed to writing small programs.

Prerequisite: Major: COSCBA or COSCBS or Minor: COSCMINU. Not available to students with Computer Science Advanced Standing. C or higher in CSC 120.

Instructors and Contact Information

- Instructor of Record: Rick Mercer <mercer@cs.arizona.edu>
- Rick's Zoom Hours (because they work better than office hours): See the D2L page under the Zoom Office Hours tab that will also list the TAs Zoom and/or Office Hours

Teaching Assistants (TAs)

First Name	Last Name	Email
Aman	Dwivedi	adwivedi@arizona.edu
Bennett	Brixen (Coordinator)	bennettbrixen@arizona.edu
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Course Format: This course will be taught in the “Hybrid (Flex In-Person)” modality. This means there will be asynchronous online activity such as watching Panopto recordings on D2L before synchronous face to face activities in Gittings Bldg, Rm 129B MWF. After the first week of typical face to face meetings MWF, two lectures will be available as Panopto recordings on D2L each week. You will have a window of several days to watch each lecture. Another name for this is “Flipped Classroom”.

The first pre recorded lecture will be available by 6:00 pm each Thursday and should be completed by 11:59 pm the following Sunday. The second pre recorded lecture will be available by 6:00 pm each Monday and should be completed by 11:59 pm the following Tuesday. Watching the lecture recordings is also called “Panopto Participation”, which is a grade category worth 15% of your final grade (the same weight as Test 1 and Test2). Panopto Participation grading will occur at noon Mondays and Wednesdays. You will need to watch all of a Panopto recording by noon to get full credit of 3/3. These Panopto lecture recordings will be available all semester on our D2L website for review.

There will typically be two relatively small Assignments each week. At the end of the semester, there will be one larger Assessment Project in two one-week iterations. Assignments are worth 45% of your final grade. There will be a 24 hour late penalty period that will cost you a 10% reduction in the grade. Assignments assigned on Mondays will be due before 11:59 pm the following Thursday. Assignments assigned on Wednesday will be due by 11:59 pm the following Monday. There very well may be overlap if you wait until the day an Assignment is due to begin it. Start Assignments as soon as they are assigned.

Obtaining Help

- **Academic advising:** If you have questions about your academic progress this semester, or your chosen degree program, consider contacting your department’s academic advisor(s). Your academic advisor and the [Advising Resource Center](#) can guide you toward university resources to help you succeed. **Computer Science major students** are encouraged to email advising@cs.arizona.edu for academic advising related questions.
- **CS Help Desk:** The Computer Science IT team can help students with department technology issues, printing in the 930 lab, etc. You can submit a ticket for help by visiting the [Computer Science Lab Helpdesk](#) (note, requires UA login).
- **Life challenges:** If you are experiencing unexpected barriers to your success in your courses, please note the Dean of Students Office is a central support resource for all students and may be helpful. The [Dean of Students Office](#) can be reached at 520-621-2057 or DOS-deanofstudents@email.arizona.edu.
- **Physical and mental-health challenges:** If you are facing physical or mental health challenges this semester, please note that Campus Health provides quality medical and mental health care. For medical appointments, call (520-621-9202. For After Hours care, call (520) 570-7898. For the Counseling & Psych Services (CAPS) 24/7 hotline, call (520) 621-3334.
- **UA Ombuds:** The [UA Ombuds Office](https://ombuds.arizona.edu/) (<https://ombuds.arizona.edu/>) helps with a wide

variety of issues, concerns, questions, conflicts, and challenges. The primary mission of the Ombuds Program is to assist individuals in resolving conflict, facilitating communication, and assisting the University by surfacing issues and providing feedback on emerging or systemic concerns. Communications with the Ombuds Committee are informal and off-the-record. The Ombuds Committee is governed by the following standards: (1) Confidentiality; (2) Impartiality; (3) Informality; and (4) Independence.

- **CS Tutor Center:** The Department of Computer Science offers FREE tutoring for students enrolled in CSC courses. You can view tutor schedules and sign up for tutoring sessions by visiting our [CS Tutoring Page](#).

Class Recordings (required text from the university): For lecture recordings, students must access content in D2L only. Students may not modify content or re-use content for any purpose other than personal educational reasons. All recordings are subject to government and university regulations. Therefore, students accessing unauthorized recordings or using them in a manner inconsistent with UA Arizona values and educational policies are subject to suspension or civil action.

Course Objectives: CSC 210 is designed to give you experience programming in Java using industrial strength tools and practices and that prepare you to be successful in an internship and CSC 335, which is the next course in the CSC major. Topics include data types, control structures, unit testing, classes, arrays, recursion, enums, the List and Map interfaces, polymorphism through interfaces, implementation of abstract data types using linear structures (arrays and linked), binary trees, and hash tables.

Expected Learning Outcomes: Students will be able to

- program in a different language (Java) to appreciate that the same algorithmic patterns exist in different programming languages, albeit with different syntax, each with advantages, disadvantages, their own set of quirks, ugliness, elegance, and gotchas
- partition relatively larger problems into smaller subproblems
- unit test and debug using JUnit and the Eclipse debugger
- implement concrete collection classes utilizing type safety and polymorphism with generics when given a specification as an Abstract Data Type (ADT) using data structures such as arrays, linked structures, binary trees, and hash tables
- use git, a distributed version control system and submit Assignments to GitHub
- program in Java, knowing Java very well
- experience developing relatively more complex software
- Write an event-driven program with a graphical user interface
- do well in CSC 335, for which this course is the prerequisite

Absence and Class Participation Policy

- The UA's policy concerning class Attendance, participation, and administrative drops <http://catalog.arizona.edu/policy/class-eattendance-participation-and-administrative-drop>

- Attendance will taken during team project grades in the 2nd half of the semester
- The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable
<http://policy.arizona.edu/human-resources/religious-accommodation-policy>.
- Absences pre-approved by the UA Dean of Students (or dean's designee) will be honored. See <https://deanofstudents.arizona.edu/absences>
- Participating in the course and attending lectures and other course events are vital to the learning process. As such, participation is required at all lectures. Absences will affect a student's final course grade. If you anticipate being absent, are unexpectedly absent, or are unable to participate in class online activities, please contact Rick as soon as possible. To request a disability-related accommodation to this attendance policy, please contact the Disability Resource Center at (520) 621-3268 or drc-info@email.arizona.edu. If you are experiencing unexpected barriers to your success in your courses, the Dean of Students Office is a central support resource for all students and may be helpful. The Dean of Students Office is located in the Robert L. Nugent Building, room 100, call 520-621-7057, or email DOS-deanofstudents@email.arizona.edu

Illnesses and Emergencies:

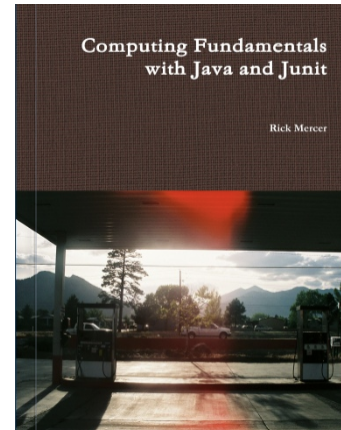
- Notify Rick if you will be missing up to, but not including one week of class
- If you must miss the equivalent of one week or more of classes and have an emergency, the Dean of Students is the proper office to contact (DOS-deanofstudents@email.arizona.edu). The Dean of Students considers the following as qualified emergencies: the birth of a child, mental health hospitalization, domestic violence matter, house fire, hospitalization for physical health (concussion/emergency surgery/coma/COVID-19 complications/ICU), death of immediate family, Title IX matters, etc. Please understand that there is no guarantee of an extension when you are absent from class and/or miss a deadline.

Makeup Policy for students who register late: No missed Assignment or Panopto recording can be made up for credit if you add this course past the deadline for that Assignment. It is recommended you do everything missed and watch every lecture, but you will receive zeros if you add this course past the deadlines.

Course Communications: Official online communications will be conducted through D2L, our course web page, Piazza, email, and Panopto recordings of screencasts of lecture on D2L. You are required to watch all Panopto screencasts, read all emails from us, and read all Piazza posts. You will be using D2L to turn in Assignments in the beginning and Github submissions later in the course.

Optional Textbook: Computing Fundamentals with Java and JUnit, Rick Mercer, Paaz Publishing. This summer you can read the textbook either as a free .pdf in [Rick's Book](#) or as a purchased hard-copy version for \$20.00 plus shipping. Shipping takes 5 to 10 days for delivery from the time of order because Lulu prints and ships the printed copy a few days after your order. At this link. The textbook can be purchase on Lulu at this link:

<http://www.lulu.com/shop/rick-mercere/computing-fundamentals-with-java-and-junit/paperback/product-23373195.html>



Instructor and TA Availability: The instructor and TAs will be accessible by email and Zoom (Office) Hours that will be posted on the Zoom Hours on our D2L Website.

Required or Special Materials: You will need a Mac or Windows laptop or desktop computer to complete Assignments. You will also need the Internet to access D2L for Lecture recordings, assignments, and grades. Other software installations are required for Eclipse, Git, and JavaFx. All of which can be installed at no cost.

Scheduled Topics/Activities by Week (subject to change)

1. Syllabus, Preview Java, Install Java and the Eclipse IDE, Java fundamentals, IPO Algorithms, Console I/O, Objects, classes,
2. String objects, Java methods/parameters, JUnit testing, selection algorithmic patterns, determinate loops with the while loop
3. Indeterminate loops with while, File I/O, Debugging with the Eclipse source code level debugger
4. for loops, arrays
5. More arrays
6. Algorithm Analysis,, generics with <Type> arguments, Test preview
7. **Test 1:** Monday 25-Sep, 9:00 am - 9:50 am in Gittings 129B, Java classes with instance variables and constructors, classes with array instance variables
8. PriorityQueue<Type>, the singly-linked data structure
9. Simple recursion, recursion with private helpers for arrays and linked structures
10. Binary trees, Expression tree, recursive backtracking
11. Binary Search Trees (BSTs), Map ADT, HashMap implementation,
12. **Test 2:** Monday 6-Nov, 9:00 am - 9:50 am in Gittings 129B, Git, Github
13. Java. util.HashMap, Probabilistic Text Generation
14. Enums, Assessment Project with Domain Analysis
15. Refactoring, Object Relationships
16. Graphical user interfaces (GUIs), Event driven programming
17. **Final Exam:** Thursday 14-Dec 10:30 am - 12:30 pm in Gittings 129B

Grading Assessments and Weights	Letter Grade
45% Assignments: none dropped, 24 hour late penalty of 10% 15% Test 1: Monday 25-Sep, 9:00 am - 9:50 am in Gittings 129B 15% Test 1: Wednesday 27-Sep , 9:00 am - 9:50 am in Gittings 129B 15% Test 2: Monday 6-Nov, 9:00 am - 9:50 am in Gittings 129B 10% Final Exam: Thursday 14-Dec 10:30 am - 12:30 pm in Gittings 129B 15% Panopto Participation, none dropped <u>Percentage of the Panopto lecture recording viewed on D2L</u> 0%..19% 0 points 20%..59% 1 point 60%..89% 2 points 90%..100% 3 points	A >= 90% B 80.0 to 89.9% C 70.0 to 79.9% D 60.0 to 69.9% E < 60.0 <i>No rounding up 89.9 will be a B.</i>

- The two tests will be taken as 50-minute open book D2L quizzes that will be available to begin at 9:00 am in our meeting room. Students with DRC test accommodations will be given alternative times. Both tests will be graded within one week.
- The Final Exam will be taken as a two-hour D2L quiz will be graded within two days
- Asynchronous required Panopto Participation recordings should be watched within these time windows. Panopto Participation grades will be recorded at 12:00 noon on Mondays and Wednesdays for a 3/3 so you have some leeway. You can watch them later for 0/3.
 - 5:00 pm Thursdays to 11:59 pm Sundays
 - 5:00 pm Mondays to 11:59 pm Tuesdays
- Assignments that open Monday at 9:00 am are due the following Thursday at 11:59 pm. Assignments that open on Wednesday at 9:00 am are due the following Monday at 11:59 pm.. This is 3.5 days, or half a week, each. Overlap is possible if you wait until the due date to begin an Assignment. Assignments will be graded before the next one is due, generally by 11:59 pm Wednesdays and Sundays.
- The larger Assessment project will have two one week turnins at the end of the semester.
- Our D2L Assignment dropbox will stop accepting submissions one day after the due date. If you miss the due date, you will have 24 hours to turn in Assignments with a 10% late penalty. Begin all Assignments when they are assigned. This helps to avoid zeros and reduces the temptation to cheat. Individual extensions may be granted due to extenuating circumstances. You must send an email to mercerc@cs.arizona.edu if you have a valid reason to request an extension. Assignments will be graded before the next Assignment is due.
- Panopto Participation is based on the percentage of each Panopto recording of lectures viewed. Panopto Participation will be graded as soon as 11:00 am Mondays and Wednesdays..

Academic integrity/responsibilities: Unless otherwise specified, all work must be completed individually. However, it is permissible to use code from lecture presentations, code demos, and our textbook. Obtaining solutions from the Internet, paying someone for code, copying code from other

students, or in general, turning in code that is not your own work for Assignments or tests is expressly forbidden and could result in severe penalties. The same applies to the two tests. All work turned in must be your own.

Department of Computer Science Code of Conduct: The Department of Computer Science is committed to providing and maintaining a supportive educational environment for all. We strive to be welcoming and inclusive, respect privacy and confidentiality, behave respectfully and courteously, and practice intellectual honesty. Disruptive behaviors (such as physical or emotional harassment, dismissive attitudes, and abuse of department resources) will not be tolerated. The complete Code of Conduct is available on our [department web site](#). We expect that you will adhere to this code, as well as the UA Student Code of Conduct, while a member of this class.

Classroom Behavior Policy: To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming, and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed. The University of Arizona has an explicit policy on disruptive behavior that includes the instructor's right to have you leave the classroom, or in the case of an online course, remove you from Piazza.

<http://policy.arizona.edu/education-and-student-affairs/disruptive-behavior-instructional-setting>

Threatening Behavior Policy: The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to oneself. See

<http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>

Accessibility and Accommodations: At the University of Arizona, we strive to make learning experiences as accessible as possible. If you anticipate or experience barriers based on disability or pregnancy, please contact the Disability Resource Center (520)-621-3268,

<https://drc.arizona.edu/> to establish reasonable accommodations.

Nondiscrimination and Anti-harassment Policy: The University of Arizona is committed to creating and maintaining an environment free of discrimination. In support of this commitment, the University prohibits discrimination, including harassment and retaliation, based on a protected classification, including race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, or genetic information. For more information, including how to report a concern, please see

<http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy>

Academic Integrity and Penalties (a.k.a. Cheating): Other Prohibited Conduct includes "All forms of student academic dishonesty, including but not limited to cheating, fabrication, facilitating academic dishonesty, and plagiarism." Students are responsible for understanding and complying with the University's Code of Academic Integrity.

<http://deanofstudents.arizona.edu/codeofacademicintegrity>.

Among other provisions, the Code demands that the work you submit is your own, and that graded programs and exams will not subsequently be tampered with. The Code demands that you do not

turn in copied code as if it were your own work. It is immaterial whether the copying is done electronically, by retyping, or using solutions from the Internet, or any other means you may think of. If your code matches another person's code or code from the Internet, a report will be filed to the Dean of Students with these possible sanctions:

A faculty member may impose any one or a combination of the following sanctions: ... loss of credit for the work involved, reduction in grade, notation of the violation(s) on the student's transcript, a failing grade in the course, or revocation of a student's degree. The faculty member may also impose a sanction of suspension or expulsion from the program, department, college, or University.

These sanctions also occur if you help another person or team cheat. Do not post your code to the Internet. Don't give code to anyone, especially your friends. Do not help any person cheat in any way even when they promise you they will not use your code. You may reuse any code from our required textbook, lecture code demos, resources associated with this course. Additionally, you may use code snippets found on the Internet as long as you credit those small pieces of code with the author's names, even if you modify it.

How to Avoid Such Serious Sanctions: Begin your Assignments as soon as possible. Do not wait until the due date! This is when desperation sinks in and you are tempted to get a copy from a friend. You are better off getting a zero than getting caught cheating. The work you turn in must be your own, not another person's work. Do not copy other projects. Do not give your code to anyone even if the other person promises not to turn it in as their own, in which case you who did all the work may suffer the same sanctions.

Land Acknowledgement Statement: We respectfully acknowledge the University of Arizona is on the land and territories of Indigenous peoples. Today, Arizona is home to 22 federally recognized tribes, with Tucson being home to the O'odham and the Yaqui. Committed to diversity and inclusion, the University strives to build sustainable relationships with sovereign Native Nations and Indigenous communities through education offerings, partnerships, and community service.

Requests for incomplete (I) or withdrawal (W): must be made in accordance with university policies

- **Incomplete Policies**
- **Withdrawal Policies**

Additional Resources for Students:

UA Academic policies and procedures are available at <http://catalog.arizona.edu/policies> Visit the [UArizona COVID-19](#) page for regular updates.

Campus Health <http://www.health.arizona.edu/>. Campus Health provides quality medical and mental health care services through virtual and in-person care. Voluntary, free, and convenient

[COVID-19 testing](#) is available for students on Main Campus. COVID-19 vaccine is available for all students at [Campus Health](#). Phone: 520-621-9202

Counseling and Psych Services (CAPS) <https://health.arizona.edu/counseling-psych-services>. CAPS provides mental health care, including short-term counseling services. Phone: 520-621-3334

The Dean of Students Office's Student Assistance Program

<http://deanofstudents.arizona.edu/student-assistance/students/student-assistance>

Student Assistance helps students manage crises, life traumas, and other barriers that impede success. The staff addresses the needs of students who experience issues related to social adjustment, academic challenges, psychological health, physical health, victimization, and relationship issues, through a variety of interventions, referrals, and follow up services.

Email: DOS-deanofstudents@email.arizona.edu. Phone: 520-621-7057

Survivor Advocacy Program <https://survivoradvocacy.arizona.edu/>. The Survivor Advocacy Program provides confidential support and advocacy services to student survivors of sexual and gender-based violence. The Program can also advise students about relevant non-UA resources available within the local community for support. Email: survivoradvocacy@email.arizona.edu
Phone: 520-621-5767

Safety on Campus and in the Classroom For a list of emergency procedures for all types of incidents, please visit the website of the Critical Incident Response Team (CIRT): <https://cirt.arizona.edu/case-emergency/overview>. Also watch the video available at https://arizona.sabacloud.com/Saba/Web_spf/NA7P1PRD161/common/learningeventdetail/crtfy00000000003560

Confidentiality of Student Records <http://www.registrar.arizona.edu/ferpa>

Subject to Change Statement: Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.