CS3 Introduction to Software Design

COMP 3081, Fall 2024

Section 001
Monday, Wednesday 12:40-2:05 p.m.
Ball Hall 124

https://memphis.instructure.com/courses/141133

Section 002
Tuesday, Thursday 9:40-11:05 a.m.
Art & Communication Building 247

https://memphis.instructure.com/courses/141652

Please send all emails to all instructors and TAs, and reply-all to all emails.

Instructor: Kathryn Bridson <kbridson@memphis.edu>
Office Hours: By appointment; no set hours, but I will make every effort to respond to messages within one business day
Office: Dunn Hall 303; meetings held in Discord or Zoom, or in person by special appointment

Teaching Assistant: Alex Illev <Alex.Iliev@memphis.edu>
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1 Catalog Description

COMP 3081 - CS3 Introduction to Software (3)
Full-stack development; current technologies for software development; event-driven programming in the model-view-controller design; regular expressions; declarative programming and object-relational mapping; syntax, lexical analysis. PREREQUISITE: COMP 2150, or permission of instructor

2 Topics

The course will cover the following topics:

- **Unix-like Environments and the Command-Line**
  - Setting up the environment
  - Basic Unix commands and file system
  - Scripting, Creating your own commands (Zsh, Python)
- **Version Control Systems with Git and GitHub**
  - Git data structures and basic commands
  - Using Github to create and manage individual git repos
  - Branching and merging with Git
- **Ruby Programming**
  - Functional programming (Python)
  - Basics of Ruby procedural programming

    - Basics of Ruby OOP programming
    - OOP Design Principles
- **Automated Testing with Ruby and rspec**
    - Testing frameworks
    - Unit testing fundamentals and strategies
- **Regular Expressions**
    - Writing basic regular expressions (Rubular)
    - Parsing documents with regex (Ruby)
- **Web Communication**
    - HTTP Requests and Web APIs, JSON
    - HTML, CSS
    - JavaScript, Parsing and manipulating the HTML DOM
    - Static websites on GitHub Pages
- **Full-Stack Development with Frameworks**
    - Web Servers and Framework Basics
    - Model-View-Controller Design Pattern for web applications
    - Object-relational mapping (ORM)
    - Using Github to create and manage team git repos
    - Hosting a web server (Render)

3 Required Equipment

Students will be required to bring a laptop computer to lecture and to have a computer to do the work required for the course.

System Requirements:

- Must have a working webcam and microphone.
- Must be capable of running full-stack web development tools.

It is the student's responsibility to have and maintain a working laptop development environment to use for this class.

4 Required Textbooks

There are no required textbooks for this course. The instructor will provide all reading materials.

5 Evaluation

Grading weights are as follows:

- 55% Skills Assignments
- 5% Participation Activities
- 20% Exams (midterm & final @ 10% each)
- 20% Projects (2 projects @ 10% each)

To convert from percentages to letter grades, see the following table:

≥ 97%	91–96%	89–90%	87–88%	81–86%	79–80%	77–78%	71–76%	69–70%	67–68%	60–66%	≤ 59%
A+	A	A-	B+	B	B-	C+	C	C-	D+	D	F

I reserve the right to *lower* the percentage threshold for letter grades as I see fit (i.e., I may make the grading scale better for you but never worse).

5.1 Skills Assignments

Throughout the semester, each topic we cover will have Skills Assignments which will have students perform actual coding tasks using their laptop software development environment. These Skills Assignments will consist of multiple active learning activities, generally a combination of:

- Reading materials and worked examples which demonstrate the concept, coding technique, or skill
- Short, guided practice activities
- A medium-length independent practice or problem-solving activity

We will have some short lectures and demonstrations, but I will try to give some class time to start working on the active learning activities.

All assignments and due dates will be posted in Canvas.

The grading for each Skills Assignment will be as follows:

- Each Skills Assignment activity will be graded separately as high pass (H), low pass (L), or fail (F) with provided rubrics detailing the requirements for each grade. This grading scheme is designed to allow quick feedback and posting of grades.
- Students must pass (H/L) all assigned activities in a Skills Assignment to receive any credit for that assignment.
- Students must complete all parts on time. I do not accept late work; however, I will grant extensions in some extreme cases if (1) you ask before the posted due date/time and (2) we agree on a new due date (generally, only 1-2 additional days).
- Students who receive an L or F on an activity for any reason (e.g., did not submit on time, missing requirements) on the first attempt will get one additional try. The second attempt Canvas assignment will open when the grades for the first attempt are posted and will be due by a specified date.
- Based on the combination of H/L/F, a numerical grade will be assigned for each Skills Assignment. The assignment rubric will include the combinations required for each letter grade.

5.2 Exams

The course will have two exams: a midterm and a final. The final will be given during the official final exam period for each section. The date of the midterm will be announced at least 2 weeks in advance.

Exams will be proctored and given during class time. They will be given through Canvas with increased anti-cheating measures to be announced before the exam. They will be closed-everything (note, neighbor, course materials, IDE, etc.). The use of any prohibited aids during exams will constitute academic dishonesty.

If you are unable to take an exam as scheduled, please let me know as soon as possible. Make-up exams must be scheduled and taken within 3 days following the originally scheduled exam. Be prepared to show some kind of documented proof of your situation.

The exams will be designed to evaluate student's mastery of the **conceptual knowledge** covered in the course.

5.3 Projects

In addition to the Skills Assignments, the course will include two larger projects to allow students to demonstrate a combination of **practical skills** they have developed during the Skills Assignments.

6 Academic Integrity

The University of Memphis expects all students to behave honestly. The Student Code of Rights and Responsibilities explains what constitutes a violation of our Academic Integrity policy. For more information, please see the Office of Student Accountability's website: https://www.memphis.edu/osa/. Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students who violate the academic misconduct policy, either directly or indirectly, through participation or assistance, are immediately responsible to the instructor of the class in addition to other possible disciplinary sanctions which may be imposed through the regular institutional disciplinary procedures.

Examples of academic dishonesty include, but are not limited to:

- Cheating – A student uses a smart phone to access the internet while taking a quiz.
- Copyright infringement – A student uses a photograph found on the internet in a presentation without obtaining permission from the photographer.
- Deception – A student gives a dishonest excuse when asking for a deadline extension.
- Denying access to information or material – A student makes library or shared resource material unavailable to others by deliberately misplacing those resources.
- Fabrication – A student invents data in an academic work.
- Facilitating academic misconduct – A student knowingly allows a portion of their work to be used by another student.
- Plagiarism – A student represents the ideas of another in a paper without citing and referencing the work or a student turns in the same or nearly the same assignment for credit in more than one class.
- Sabotage – A student prevents others from completing their work by opening a window to affect a temperature-controlled experiment.
- Unauthorized collaboration – A student works with other students on a paper without the specific permission of the instructor.

6.1 Course-Specific Policies

As per department policy, any student caught cheating in the course will receive at minimum a 0 grade on the assignment/test and be reported to the Office of Student Accountability.

By the end of this course, you are expected to have developed competencies in the technologies, concepts, and skills discussed. This is important for success in future courses, and more importantly so that you can get a job later! To improve your programming skills, you must get plenty of practice yourself. As such, all grade items (unless specifically indicated otherwise) must be individual efforts. Although you are welcome to work in study groups, NEVER submit any code that you did not write yourself.

You **CAN**:

- Discuss the general solution approach to an assignment with other students, then write the code to solve the problem individually.
- Use Internet resources to help you understand the terms, concepts, instructions, or strategy for an assignment, then write your own code that incorporates what you've learned.

You **CANNOT**:

- Submit someone else's code for an assignment, quiz, or exam. Making trivial changes like changing variable names and/or order of functions does not hide this.
- Submit a solution/code that you found on the Internet.

6.2 AI Tools (e.g., ChatGPT, Github Copilot) Policies

Appropriate use of AI tools and/or ChatGPT is permitted on some assignments in this class. We will be discussing what constitutes appropriate use of AI as the semester progresses, and I reserve the right to modify this policy at any time. For now, I believe that it is appropriate to use AI as a tool to help you improve your programming ability. However, it is not appropriate to use it as a substitute for the critical thinking, reasoning, and logic skills that are required to create a program to solve a given problem. This course is designed to help you improve these skills which will be critical to your success, both during college and in your future career.

6.2.1 Exams

All AI tools are prohibited on assessments, and their use will constitute academic dishonesty.

6.2.2 Skills Assignments

Since AI tools cannot be used on assessments, be careful not to rely too heavily on them when completing the practice assignments.

If you choose to use an AI tool like ChatGPT, you must include the following in your submission:

- a statement that you used an AI tool,
- the name of the tool used, and
- an export of or link to the conversation which includes all question prompts and AI responses.

This information will help me better understand how students use these tools and offer better support for them in the future.

If you are not sure if a given question or use case would be an acceptable use of an AI tool, do not assume it is, and ask the instructor first.

7 Classroom Behavior

Students should be aware of the Student Code of Rights and Responsibilities which describes examples of unacceptable classroom behavior. Disruptive classroom behavior will not be tolerated. Instructors are empowered to remove students from class and refer behaviors for sanctioning to the Office of Student Accountability.

8 Equity, Inclusion, and Accommodations

Our class respects all forms of diversity. The University of Memphis embraces the diversity of students, faculty, and staff, honors the inherent dignity of each individual, and welcomes their unique perspectives, behaviors, and worldviews. In this course, people of all races, religions, national origins, sexual orientations, ethnicities, genders and gender identities, cognitive, physical, and behavioral abilities, socioeconomic backgrounds, regions, immigrant statuses, military or veteran statuses, size and/or shapes are strongly encouraged to share their rich array of perspectives and experiences. Course content and campus discussions will heighten your awareness to each other's individual and intersecting identities. In accordance with UofM Policy GE2004, the University will ensure students receive consistent and fair treatment and affirmation of the University's commitment to diversity. The University prohibits discrimination and harassment based on protected characteristics as stated in UofM Policy GE2030.

Please see the instructor if you need accommodations for a disability, or to fulfill cultural or religious obligations. Students with requests for accommodations should contact Disability Resources for Students to register and learn about the services available to support their learning. Students with disabilities are encouraged to speak with us privately about academic and classroom accommodations. It is strongly encouraged that you register with Disability Resources for Students (DRS) to determine appropriate academic accommodations. Disability Resources for Students is located in 110 Wilder Tower, their phone number is (901) 678-2880 (V/TTY), their email is drs@memphis.edu, and their website is https://www.memphis.edu/drs/. Disability Resources for Students coordinates all accommodations for students with disabilities.

Qualified students with disabilities will be provided reasonable and necessary academic accommodations if determined eligible by the appropriate Disability Resources for Students staff at the University. Prior to granting disability accommodations in this course, the instructor must receive written verification of a student's eligibility for specific accommodations from the Disability Resources for Students staff at the University. It is the student's responsibility to initiate contact with University's Disability Resources for Students staff and to follow the established procedures for having the accommodation notice sent to the instructor.

9 Mental Health

As a student you can sometimes feel overwhelmed, lost, experience anxiety or depression, and struggle with relationship difficulties or diminished self-esteem. Mental health challenges can interfere with optimal academic performance. However, many of these issues can be effectively addressed with some help. If you find yourself struggling with your mental or physical health this semester, please feel free to approach me. I will try to be flexible and accommodating. As your instructor, I am not qualified to serve as a counselor, but UofM offers confidential counseling services on-campus and via telehealth that are available to students taking six or more credits at no cost. UofM Counseling Center is staffed by experienced, professional psychologists, clinical social workers, and counselors, who are attuned to the needs of college students. I strongly encourage you to take advantage of this valuable resource. To connect with Counseling Center services, please visit 211 & 214 Wilder Tower, or call 901.678.2068. To know more about their services, you can visit their website at https://www.memphis.edu/counseling. In a crisis situation, please call 901.678.HELP (4357) to speak to the On-call counselor. Remember, getting help is an intelligent and courageous thing to do -- for yourself and for those who care about you.

10 Personal or Academic Challenges including Food & Housing Insecurity

If you are experiencing personal or academic challenges including, but not limited to food or housing issues, family needs, or other stressors, please visit the Dean of Students Office to learn about resources that can help. Any student who faces personal challenges including, but not limited to securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students Office at 901.678.2187 located in the University Center, Suite 359 for assistance. If you are comfortable doing so, please also let the instructor know you are experiencing challenges as they may be able to assist you in connecting with campus or community supports.

11 Personal Relationships

There are special problems in any personal relationship between individuals where one party possesses direct academic, administrative, supervisory, evaluative, counseling or extracurricular authority over the other party. Such positions include, but are not limited to, teacher and student or assistant, supervisor and employee, senior faculty and junior faculty, mentor and trainee, advisor and advisee, counselor and client, teaching assistant and student, coach and athlete, and the individuals who supervise the day-to-day student living environment and student residents.

In accordance with UofM Policy HR5050, no University employee shall enter into or maintain any personal relationships with students or with employees over whom they exercise or, reasonably can expect to exercise, direct or indirect control in areas such as academics, administration, supervision, evaluation, counseling or extracurricular authority or influence. No University employee shall exercise any direct or indirect control in the areas of academics, administration, supervision, evaluation, counseling or extracurricular authority over any student or employee with whom that employee had previously been involved in a personal relationship.

Any employee, including faculty, who is currently in a personal relationship or becomes involved in a personal relationship that might be covered by terms of this policy, must disclose the relationship immediately to Human Resources-Employee Relations and Engagement so that any and all steps are taken to comply with this policy.