



Computer Sciences, CS400 PROGRAMMING III

3 Credits

Canvas Course URL: <https://canvas.wisc.edu/courses/170796>

Course Designations and Attributes

Intermediate, Natural Sciences, L&S Credit Type: C

Meeting Time and Location (Sep 4, 2019-Dec 11, 2019)

Lecture 001 MW 2:30-3:45 145 [Birge Hall](#)

Lecture 002 TR 2:30-3:45 5206 [Sewell Social Sciences](#)

Instructional Mode

Face-to-face and online discussion work.

Specify how Credit Hours are met by the Course

Lectures meet for 150 minutes each week over the typical fall/spring semester and carries the expectation that students will work on course learning activities (reading, writing, problem sets, studying, etc) for about 6-8 hours out of classroom each week. Additional time is typically required for completing graded discussion and programming assignment work.

INSTRUCTORS AND TEACHING ASSISTANTS

Instructor Title and Name: Faculty Associate, Debra Deppeler, deppeler@cs.wisc.edu

Instructor Availability: <https://pages.cs.wisc.edu/~deppeler/cs400/>

Instructor Email/Preferred Contact: deppeler@cs.wisc.edu or office phone: (608) 265-9452

Teaching Assistant (if applicable): TBA

TA Lab Consulting: https://pages.cs.wisc.edu/~deppeler/cs400/pages/lab_hours.html

TA Email/Preferred Contact: <https://pages.cs.wisc.edu/~deppeler/cs400/>

OFFICIAL COURSE DESCRIPTION

Course Description

The third course in our programming fundamentals sequence. It presumes that students understand and use functional and object-oriented design and abstract data types as needed. This course introduces balanced search trees, graphs, graph traversal algorithms, hash tables and sets, and complexity analysis and about classes of problems that require each data type. Students are required to design and implement using high quality professional code, a medium sized program, that demonstrates knowledge and use of latest language features, tools, and conventions. Additional topics introduced will include as needed for projects: inheritance and polymorphism; anonymous inner classes, lambda functions, performance analysis to discover and optimize critical code blocks. Students learn about industry standards for code development. Students will design and implement a medium size project with a more advanced user-interface design, such as a web or mobile application with a GUI and event- driven implementation; use of version-control software.

Requisites

COMP SCI 300, graduate/professional standing, or declared in the Capstone Certificate in Computer Sciences for Professionals

LEARNING OUTCOMES

Course Learning Outcomes

Students will be able to ...

- describe, use, and implement efficient data structures including balanced search trees, hash tables, and graphs.*
- work effectively in project teams by establishing goals, rules of conduct, and effective communication strategies*
- analyze the complexity and performance of different algorithm and data structure choices*
- prepare and present program design choices to stakeholders*
- able to define custom data structures and implement desired operations as needed*
- design and implement an effective dashboard graphic user interface*
- find, install, configure, and use language and project development tools*

GRADING

Final grades are based on a student's quantity and quality of work as determined by their final weighted percentage. Letter grades for students near a border are determined by their exam percentage.

Note: Canvas computes a total percentage based on the points for each item in each category. This is a reasonable estimate. However, in some cases, the number of points for graded work does not reflect actual the weight of a given assignment.

Strictly speaking lecture attendance and participation lecture is not part of the final grade computation. But, it is my expectation that active participation during lecture activities will help students identify areas where their understanding is lacking and they may benefit from additional study outside of lecture with classmates, teaching assistants (during lab consulting), or meeting with their instructor (during office hours or by appointment).

This Letter Grade Scale is included for context. But, the actual thresholds used may be adjusted based on difficulty for any given semester. Typically, the average grade in the course is a B or better.

A 94% and higher

AB 89-93.999

B 82-87.999

BC 76-81.999

C 70-75.999

D 66-69.999

F < 66%

DISCUSSION SESSIONS

There are no required discussions sections. But, students are required to complete several activities with their assigned discussion group. These activities may be completed synchronously (via in-person meetings by submitting meeting minutes) or asynchronously (via online shared documents that show individual contributions).

LAB CONSULTING SESSIONS

Students are not required to attend scheduled labs or meet with teaching assistants each week. But, Graduate Student Teaching Assistants are scheduled most week nights in the Computer Science Instructional Labs to assist students with a variety of course requirements including: installing, configuring, and using software development tools (IDEs and Testing & Debugging tools), submitting work to Canvas for graded assignments, understanding terminology, concepts, algorithms, abstract data types, and data structures.

Lab Consulting Schedule: https://pages.cs.wisc.edu/~deppeler/cs400/lab_hours.html.

REQUIRED TEXTBOOK, SOFTWARE & OTHER COURSE MATERIALS

- **There is no required textbook.**

If you are not familiar with Java's API, I recommend "Starting out with Java, from Control Structures through Objects", by Tony Gaddis, from Pearson. I will not assign topics from this textbook, but it does a good job of presenting intro Java concepts and common data structures. Also, it has chapters on Java FX which we will use in CS400. I have reviewed the 7th edition, but I expect other editions would also be useful to new Java programmers.

- Readings, Blogs, Podcasts, Videos, are available via Canvas site for each module.
- There may be additional fees for external feedback tools, such as: zyBooks, TopHat, GradeScope, CATME. I do my best to keep the cost low (<\$40/sem).

EXAMS, FINAL PROJECT, and PROGRAMS

- *Exams*
 - *Midterm Exam Friday 10/18 5:05pm -- 7:05pm*
 - *Final Exam Saturday 12/14 5:05pm -- 7:05pm*
 - Conflicts and accommodation requestis:
Students may submit exam accommodation requests via Online Form prior to end of week 5. We try to accommodate the following requests with an alternate time on same date:
 - Direct conflicts with course meetings.
 - Direct conflicts with other course exams.
 - McBurney VISA accommodation recommendations
 - Note: Back-to-back exams cannot be avoided and are not considered a conflict.
- *Final Project*
Students must design, develop, and implement a medium-sized Java program with a graphic user interface (using JavaFX) and an efficient data structure for queries without using click and drag design and build utilities. The work will be submitted and graded over multiple milestones.
- *Programs*
Students are require to complete several programming assignments demonstrating their ability to understand and meet program requirements, testing requirements, and commenting and style guidelines. Programs are graded based on our test results of the submitted code as well as Teaching Assistant and peer review of your commenting and style.

HOMEWORK & DISCUSSION ASSIGNMENTS

- Homework exercises will be due each Friday and accepted for credit as late as Sunday evening. Most homework exercises are graded quizzes. The solution for homework quizzes will be available after quiz availability has passed for all students.
- Discussion posts (xteam) and comments will be due by Tuesday of each week. Students will submit their discussion posts and comments via Canvas, by submitting the URL which submits a snapshot of the page at the submissions date and time.

OTHER COURSE INFORMATION

- RELIGIOUS OBSERVANCES
Students must notify me within the first two weeks of class of the specific days or dates which they will not be able to complete mandatory course assignments.
- TEAMWORK
Students are required to work in teams for some assignments. Some activities are intended to help students learn team building skills, while others are intended to give students the opportunity to practice what they have learned. Failing to communicate

with your team members effectively may result in your removal from that team. Being removed from a team may mean that points for remaining team assignments are not available to you. We may combine and split up teams in extreme cases. Students should treat all team assignments with the same importance as they would treat a team project their boss assigned them.

- **SUBMIT WORK EARLY and OFTEN**

Submit all program assignment work early, often, and check the file contents of the work that you have submitted to ensure it is the correct file. It is best to submit well before the due date and time, while there is still time to resubmit if there is a problem. Once the availability period has ended and grading work has begun, you will not be able to submit your work. We cannot submit work to Canvas for you.

RULES, RIGHTS & RESPONSIBILITIES

- See the Guide's to [Rules, Rights and Responsibilities](#)

ACADEMIC INTEGRITY

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to studentconduct.wiscweb.wisc.edu/academic-integrity/.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

McBurney Disability Resource Center syllabus statement: "The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA." <http://mcburney.wisc.edu/facstaffother/faculty/syllabus.php>

DIVERSITY & INCLUSION

Institutional statement on diversity: “Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals.

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world.” <https://diversity.wisc.edu/>