

# CS354 Course Information Fall 2024

## Description

An introduction to fundamental structures of computer systems and the C programming language with a focus on the low-level interrelationships and impacts on performance. Topics include the virtual address space and virtual memory, the heap and dynamic memory management, the memory hierarchy and caching, assembly language and the stack, communication and interrupts/signals, assemblers/linkers and compiling.

**Instructors:** Deb Deppeler, 5376 CS, [deppeler@cs.wisc.edu](mailto:deppeler@cs.wisc.edu), (lectures 001 and 002)  
Dr Hina Mahmood, 4226 CS, [mahmood@cs.wisc.edu](mailto:mahmood@cs.wisc.edu) (lecture 003)

- ◆ <https://canvas.wisc.edu/courses/382145/pages/lectures-information-and-policies>
- ◆ <https://pages.cs.wisc.edu/~deppeler/cs354/outlines/syllabus.pdf>

## Lectures are held in-person

- ◆ **Lecture 001 TR 11:00 AM - 12:15 PM AB20 Weeks Hall (deppeler)**
- ◆ **Lecture 002 TR 2:30 - 3:45 PM 2650 Humanities (deppeler)**
- ◆ **Lecture 003 TR 4:00 - 5:15 PM 113 Psychology (mahmood)**

## Textbooks

- ◆ The C Programming Language, Kernighan & Ritchie, 2nd Ed., 1988
- ◆ Computer Systems: A Programmer's Perspective, Bryant & O'Hallaron, 2nd Ed, 2010  
Note: 3rd edition is fine until assembly language and registers are covered.  
Finding an online pdf for each book is also fine.

## Piazza

- ◆ is used for online course discussions and questions with classmates and the TAs about homeworks, projects, and course concepts as well as course logistics

**CS Account, See:** <https://apps.cs.wisc.edu/accountapp/>

- ◆ a CS network login for access to your CSL account and computers with dev tools
- ◆ Linux workstations in rooms: **1366**, 1355, 1358, 1368

## TAs: Teaching Assistants

- ◆ Graduate students with backgrounds in computer architecture and systems
- ◆ Grading and course concepts, Linux, C tools and language, homeworks, and projects
- ◆ TA consulting is held in 1366 CS during scheduled hours, see **TA Consulting**

## PMs: Peer Mentors (available for in-person support for students)

- ◆ Undergraduate students that have recently completed CS 354
- ◆ Drop-in hours (in 1333) and a variety of activities to help students succeed, which are posted on course's **PM Activities** page

## Coursework

*Canvas will have and enforce all coursework hand-in deadlines.*

### Exams (60%)

- ◆ Midterm (15%): Thursday, October 3rd, 7:30-9:30pm
- ◆ Midterm (20%): Thursday, November 7th, 7:30-9:30pm
- ◆ Final (25%): Thursday, 12/19 10:05 am -12:05 pm

*If you have direct exam conflict or McBurney accommodation request, complete the form at: <http://tiny.cc/cs354-conflicts> by the end of Week 2*

### Project Learning Objectives (30%): (tentative desc) (no project drops)

- ◆ p1 Describe each step in the process to make an executable program from C source code
- ◆ p2A Read data from a file, use stdlib functions and address-arithmetic to build a dynamically allocated array from the data, analyze it for correctness, and produce output with those results.
  - ◆ p2B Create pseudocode to implement an algorithm described in English, build a dynamically allocated array using address-arithmetic and write to a file
- ◆ p3A Implement allocation operation for a dynamic memory manager
- ◆ p3B Implement free and coalesce for your dynamic memory manager
- ◆ p4a Write several small programs to run analyze and learn the effects of
- ◆ p4b Implement a program that simulates the state of a cache and tracks a given sequence of reads and write to determine the number of hits and misses for given sized cache.
- ◆ p5 Dissassemble a program and try to crack the safe's code
- ◆ p6 Send and receive signals and handle exceptional events.

Canvas enforces Program due dates and availability dates.

Submit all assignment work on or before Canvas Due Date for **6 ONTIME points**

**Submit on or before Availability date for full credit except for the ONTIME points.**

CAUTION: Assignment pages that have been left open on your computer become “stale” and the submit form button may no longer work. If you have a submit button that does not appear to work, be sure close and reopen the assignment page, browser, and then refresh the browser page to get a working submission form again.

**PROGRAM WORK MARKED ‘Late’ by CANVAS is ACCEPTED** but no ONTIME pts.

**PROGRAM WORK THAT YOU CANNOT SUBMIT TO CANVAS IS NOT ACCEPTED.**

If you really mess up and do not submit your project p2A, p2B, p3A, p3B, p4B, work before the assignment's availability period ends, you may elect to use your OOPS point (if you have earned it). See the OOPs assignment for more details on how to use this for a single miss on submitting your programming project.

**Homeworks (8%): 9 “weekly” homework quizzes (drop lowest score)**