

Instructor

Craig E. Wills, FL-236, cew@cs. Office hours: TBA. Any time for short questions. Electronic mail is an effective method to contact me.

The instructor has overall responsibility for the course, its contents and its presentation.

Assistants

- TA: Christopher Lieb, chris.lieb@cs. Office hours: TBA;
- TA: Fei Song, fes@cs. Office hours: TBA.
- SA: Isaac Edwards, iedwards@wpi. Office hours: TBA.
- faculty + assistants: cs2301-staff@cs.

Course Web Page

Copies of all handouts, assignments, notes and old exams will be posted as appropriate on the course Web page. Most material on this site is password protected. The address for it is <http://www.cs.wpi.edu/~cs2301/d10/>.

Purpose

This course is intended to help students with prior program design experience migrate their skills to a model of programming where the programming language exposes details of how the hardware stores and executes software. The course focuses on advanced programming concepts with an introduction to data structures.

The objectives expected to be met by students are 1) to demonstrate a foundation for further study in the Systems area of Computer Science, 2) to understand the use of advanced programming concepts and fundamental data structures, 3) to demonstrate “hands on” experience with these concepts and data structures, and 4) for students to develop specific skills for working in appropriate programming and operating system environments.

Each student will be given opportunities to demonstrate these capabilities on various projects and exercises throughout the term.

Prerequisites

Working knowledge of basic programming concepts. The programming language to be used in this course is C.

Recommended background: CS1101 or CS1102.

Laboratory

Assignments will primarily be done on CCC machines running Linux. You should already have an account on these machines. Access to these machines—you can access these machines via an *ssh* client to `ccc.wpi.edu`—is available from any lab on campus or via your own personal machine.

There will be labs every week on Wednesday in KH202. Because there are a fixed number of machines in the lab, you must attend lab during your assigned hour.

You may use your own machines for preliminary testing, but all assignments will be graded on the CCC Linux machines and it is your responsibility to ensure that your project works in this environment.

Text Books

Required:

The C Programming Language. Brian Kernighan and Dennis Ritchie. Prentice Hall Software Series, 1988.

Additional Reference:

C How to Program. H.M. Deitel and P.J. Deitel. 5th Edition. Prentice Hall, 2007.

Grading Policy

Final grades will be computed as follows:

First Exam: 15%;

Second Exam: 20%;

Third Exam: 20%;

Projects: 35%;

Other homework, in-class assignments and labs: 10%.

Grading policy for each project and homework will be provided at the time of the assignment. In general, each assignment will have a basic objective for the majority of the assignment points and an extended objective for demonstrating additional work and understanding.

Final grades will reflect the extent to which you have demonstrated understanding of the material, and completed the assigned projects. The base level grade will be a “B” which indicates that the basic objectives on assignments and exams have been met. A grade of “A” will indicate significant achievement beyond the basic objectives and a grade of “C” will indicate not all basic objectives were met, but work was satisfactory for credit. No incomplete grades will be assigned unless there exist exceptional, extenuating circumstances.

- **Programming Projects**

There will be 5-6 programming projects with the first projects also serving as a review of basic programming concepts and writing programs in C using the Linux environment. The intent is to familiarize the student with the Linux system, its editor, debuggers, etc.

- **Exams and Quizzes**

There will be three in-class exams, plus the possibility of pop quizzes for which no advance notice will be provided. Exams will be closed book, closed notes.

- **Laboratory Assignments**

These assignments are to be done during the laboratory period. The labs will be graded based on receiving or not receiving credit for the assignment. To encourage students to complete the assignment, they may be turned in up to 24 hours after the beginning of the lab.

Late Policy

Each homework and programming assignment will be given a point value when it is handed out. The point value indicates the weight of the assignment relative to the other assignments. Late programs and homeworks will be penalized 5% of total assignment value per day (with the weekend counting as one day) or partial day, and no assignments will be accepted after seven days beyond the due date. All programs and written homeworks are due at the *start* of class on the due date. Homeworks and programs turned in after the start of class will be counted late. Projects will be submitted as directed in class. Exceptions to these rules can be made only *a priori*. Finally, no assignments will be accepted after the last day of the term to allow sufficient time for grading.

Academic Honesty

Unless explicitly noted, all work is to be done on an individual basis. You are encouraged to talk with others about ideas and material in the course, particularly in preparing for exams. However all work, in the form of code or answers to problems, you submit for grading must be your work. Misrepresentation of the work of another as one’s own submitted work is a violation of academic honesty. Aiding someone else to commit an act of academic dishonesty

is also a violation. Submitting individually-assigned work that was jointly done with another person is a violation of academic honesty.

Any violation of the WPI's guidelines for academic honesty will result in no credit for the course and referral to the Student Affairs Office. More information on definitions, responsibilities and procedures regarding the WPI academic honesty policy can be found at <http://www.wpi.edu/Pubs/Policies/Judicial/sect5.html>.

Student Disability

If you need course adaptations or accommodations because of a disability, or if you have medical information to share with the instructor, please let the instructor know. If you have not already done so, students with disabilities, who believe that they may need accommodations in this class, are encouraged to contact the Disability Services Office (DSO), as soon as possible to ensure that such accommodations are implemented in a timely fashion. The DSO is located in Daniels Hall, (508) 831-5235.

Schedule

The following is a tentative outline of the material that will be discussed in this course. All references to chapters are from K&R's book. Not all sections will be covered from each chapter, and the course meetings will be supplemented with material from other sources. Each week will entail two two-hour course meetings and a lab unless otherwise noted.

week 1: 3-15–3-18. Introduction, review, Sections 1.1, 1.2; Chapters 2 and 7. Control flow, Section 1.3; Chapter 3.

week 2: 3-22–3-25. Functions, Section 1.7; Chapter 4. Arrays/strings, Sections 1.6, 1.9; Chapter 5.

week 3: 3-29–4-1. Exam 1, Monday, March 29. Structures, Chapter 6.

week 4: 4-5–4-8. Stacks/queues. Linked lists.

week 5: 4-12–4-15. Linked lists (cont.). Searching. Exam 2, Thursday, April 15.

week 6: 4-20. One class only (on **Tuesday**). Recursion, Section 4.10; Trees.

week 7: 4-26–4-29. Hashing, bit operations, sets.

week 8: 5-3. One class only. Exam 3, Monday, May 3.