# Syllabus for CSCI 351 Intro Computer Systems Fall 2011

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Office hours:   M 2:00–4:00 p.m.
                      T 3:15–4:00 p.m.
                      WF 2:00–3:30 p.m.

I am typically in my office much more than the posted times, and you are welcome to stop by whenever my door is open. Check with me ahead of time if you want to be sure that I'll be there outside scheduled times.

## Class meetings

MWF 9:15–10:20 a.m., Science 131
Final exam: 10:30 a.m.–12:30 p.m. on Tuesday, Dec. 13

## On-line resources

Additional (and updated) course information will be available at the class page at

> http://cs.wheaton.edu/~cgray/csci351/

## Texts

Bryant and O'Hallaron, *Computer Systems: A Programmer's Perspective/2e*, Prentice Hall, 2010.

I also recommend that you have access to some reference for the need to have a C (not C++) language and library. The following is a very good reference:
Harbison and Steele, *C: A Reference Manual*, fifth edition, Prentice-Hall, 2002.

## Description

*CSCI 351 Introduction to Computer Systems*
An introduction to low-level systems issues from the perspective of the programmer. Representation of both data and program as produced by a compiler; hardware support for memory, input/output, and parallelism; fundamental ideas in operating systems and networking.
*Prerequisite:* CSCI 245.

By the end of this class, you should gain:

1. Facility in programming in C, including use of the standard libraries;

2. An understanding of the different levels at which programs and data are represented;

3. Ability to program in light of low-level understanding, especially with regard to representation and performance;

4. An understanding of key abstractions provided by programming languages and operating systems, including at least one way in which they can be implemented; and

5. Ability to use standard vocabulary to describe system features.

Exams and written homework will largely cover items 2, 4, and 5; programming assignments will include items 1 and 3 as well.

**Grading.**   Your grade will be based on the following:

       50%   exams
       10%   participation (including attendance)
       40%   homework (including programs)

There will be two in-class exams (planned for September 28 and November 4) in addition to the final. The final exam will be weighted more heavily than the in-class exams.

## Policies

**Preparation.**   You are expected to read assigned material, as indicated in the class schedule, before each class meeting: what we do in class will assume that you've done the reading. As you read, note anything that you aren't sure about, and bring your questions to class.

**Assignments**   Programming assignments are scheduled so that you should be able to complete them a day or two before the due date. Plan to complete them early; that way you'll have time to ask questions about them in class, and you'll have time to deal with surprises.

Written homework will be due at the beginning of class, though we may take time to discuss it before it is collected. As with the programs, the due dates are generally set to allow you to attempt the homework a class meeting before it is due. All homework should be neat, clearly labeled, and written on one side only of letter-sized paper; multiple pages should be stapled together.

Be sure you turn in what you have on time: I do *not* promise to give credit for late assignments.

**Academic integrity.**   I expect you to conduct yourself honestly in this course. When you submit work, you assert that it is your own. If you use an outside source or receive assistance, acknowledge it. Deliberate misrepresentation will result in no credit for the assignment; a second offense will result in failing the course. All offenses will be reported and are subject to college disciplinary action as well.

Because you are encouraged to work together and provide each other assistance, you do risk inadvertent plagiarism. Be cautious, especially when you ask for or provide assistance. Make sure that you don't let someone else do your work for you, and make sure that you don't do someone else's work. Should you discover that a program in one of the textbooks is similar enough to an assignment to provide a useful starting point, that is fine–if you understand it fully and cite it. In all cases, simply be sure that you acknowledge clearly whatever help you receive.

There are two things that you can do that will eliminate the bulk of the temptations in this area. The first is to avoid procrastination: assignments are given with plenty of time for you to ask questions in class or in my office. The second is to be careful how you ask for help: do not ask other students to tell you the solutions to assigned problems; ask questions to figure out what it is you do not yet understand and in order to understand it. (When giving help, don't be lazy and give away the answers; help your fellow students to learn.)

You are also responsible for ensuring that your work for this course isn't available for others to copy without your permission. You will need to make sure that file and directory permissions are set properly in the lab.

**Attendance.**   I expect you to be in class, and you are responsible for what happens in class whether you are present or not. If you are sick or must miss because of other school responsibilities, let me know in advance. If there is an emergency, let me know as soon as practical. You must make arrangements for make-up work (including exams) *in advance*; after-the-fact arrangements will be permitted only for emergencies, and then only with your timely notification and, in the case of illness, confirmation by the Health Center. (You'll do well to think of this as practice for keeping a job. Note that you can reach me by e-mail, and my office phone takes messages at all hours.)

I also expect you to be on time. If you come in late, don't interrupt class, and plan to find out what you've missed from another student *after* class.

**Special circumstances and needs**   I will work with you if you have any kind of special need, provided you are responsible in letting me know in time to make appropriate arrangements. Accommodation of learning disabilities requires that they be documented with the Academic and Disability Services office *and* that you inform me in time for me to communicate with that office and make the needed arrangements.

# Schedule

| Date | Reading | | Programs |
|---|---|---|---|
| Aug. 24 | | **Review and Introduction** | |
| 26 | ch. 1 | **Memory I: Representation** binary numerals | L0 out |
| 29 | ch. 2 | signs and fractions | |
| 31 | | | |
| Sep. 2 | | other types; which bit goes first? | L0 due; L1 out |
| 5 | | *Labor Day* | |
| 7 | ch. 3 | **Processor and Programs I** | |
| 9 | | | |
| 12 | | | |
| 14 | | | |
| 16 | | | L1 due; L2 out |
| 19 | | | L1 due |
| 21 | | | |
| 23 | | | |
| 26 | | | |
| 28 | | **Exam** | |
| 30 | | **Memory II: Allocation** | L2 due; L3 out |
| Oct. 3 | | | |
| 5 | | | L2 due |
| 7 | | | |
| 10 | | | |
| 12 | | | L4 out |
| 14 | | | L3 due |
| 17 | | *Fall break* | |
| 19 | | **System Model I** Protection and Abstractions | |
| 21 | | | |
| 24 | | | |
| 26 | | | |
| 28 | | **Processor and Programs II** Unexpected Events | |
| 31 | | | |
| Nov. 2 | | | L4 due; L5 out |
| 4 | | **Exam** | |
| 7 | | **System Model II: Networks** | |
| 9 | | | |
| 11 | | **System III/Memory III: Concurrency** | |
| 14 | | | |
| 16 | | **Out of sight** Caches and address translation | L5 due; L6 out |
| 18 | | | |
| 21 | | Linking | |
| 23–25 | | *Thanksgiving* | |
| 28 | | Processor implementation tricks | |
| 30 | | | |
| Dec. 2 | | | |
| 5 | | | |
| 7 | | Review | L6 due |
| 9 | | | |
| Tues., Dec. 13., 10:30 a.m.–12:30 p.m. **Final exam** | | | |