CSCI 105
Fundamental Ideas in Computer Science
Fall 2009

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Class: TR 10:20am–11:30am in PPHAC 113
Lab: 2:20pm–3:50pm in PPHAC 114 (*tentative*)
Office Hours: Days Time (or by appointment)

Course Description

> Having to solve a particular problem, we might ask: How difficult is it to solve? and What's the best way to solve it? Computer science rests on solid theoretical underpinnings to answer such questions precisely. –*Jeanette Wing*

In this course, we will answer the question "What is computer science?" and study how computer scientists approach solving problems using tools like abstraction and recursion. We will examine, as the course title suggests, the fundamental ideas in computer science and see how these ideas can be used to answer the questions posed in the preceding quote.

As this course fulfills the quantitative reasoning LinC requirement, we will also study how to convert intuitive understanding of problems into a formal specification, discuss what problem-solving techniques are appropriate for various problems, and explore different representations of data and how representing data in different ways can aid in solving problems.

Course Objectives

At the completion of this course, you should be able to:

- Describe the components of a computer and their function.
- Design computable algorithms to solve problems.
- Decide whether or not a problem can be solved computationally and whether or not it is tractable (as well as define these terms).
- Describe why some problems are "harder" than others.
- Describe why some solutions are "better" than others.

Texts

"Computer Science: An Overview" (10^{th} edition) by Brookshear. ISBN: 978-0-321-52403-4.

Schedule

Topic	**Weeks**
History of computer science	0.5
The structure and organization of modern computers	1
Algorithms and specification	6
Data abstraction	2
Complexity	2
Computability	3

Attendance Policy

This course does not have a rigid attendance policy in the sense that there is a rule describing the number of lectures that you must attend. However, please do not take this as a license to never show up to class; I expect you to be at each class meeting. Your attendance in lecture is important (beyond the usual reasons) in that homeworks, due dates, and readings will be assigned in person during lecture.

Attendance in graded lab sessions is mandatory. You may assume that you must show up to each lab; if a lab is optional, I will let you know beforehand.

Academic Honest Policy

Please read and understand the College's Academic Honesty Policy (which you can find in the Student Handbook). I will let you know what materials are appropriate to use for reference for specific assignments when the are assigned. For example, in the lab, you will generally be prohibited from using the Internet as a reference while doing lab assignments.

Since collaboration with your colleagues will be an important part of your careers, collaboration is permitted on all graded assignments (with the exception of exams). However, unless I state otherwise, you must turn in your own copy of each assignment *in your own writing*. If the ideas/algorithms expressed in an assignment are not entirely your own (*i.e.*, you worked with one of your colleagues), you must include a note stating who you worked with and the percent contributions of everyone who contributed to the work (including your contribution).

Grading Policy

There are five components to your grade:

- **Homework:** Homework will be handed out periodically throughout the semester; assignment details and due dates will be describe upon being distributed. **Weight: 40%**
- **Labs:** Each week we will meet in the lab and you will be given a series of tasks that are to be completed before leaving the lab. **Weight: 30%**
- **Tests:** There will be two midterm exams given during the semester on October 2 and November 20 (these dates are *tentative*). **Weight: 20%**
- **Final:** A cumulative final exam will be given on Tuesday December 15 at 8:30am. **Weight: 10%**

Other policy matters:

- **Grading Scale:** I will use the standard 90-80-70-60 scale with pluses and minuses to assign grades.
- **Late Homework:** I will accept homework beyond its due date with the penalty of 30% of the assignment's value per day. For example, if a homework is work 10 points and it is turned in two days late, the maximum amount of points one can receive is 4 points.
- **Lab/Exam Absence:** If you are going to miss a lab or exam due to conflict, you must let me know before the lab or exam. If you miss a lab due to some other circumstance, you must let me know as soon as possible and provide me with documentation. Valid circumstances include events like illness and family trauma. Invalid circumstances are events like hangovers and faulty alarm clocks.
- **Academic Accommodations:** Please let me know immediately if you have any disability that requires accommodation.

This syllabus is subject to change.