CS107 — Course Overview

The class

CS107 is the third course in Stanford's introductory programming sequence. Our CS106 courses provide a solid foundation in programming methodology and abstractions and CS107 follows on to develop programming maturity and expand breadth and depth of experience. The course will work from the C programming language down to the microprocessor to de-mystify the machine. With a complete understanding of how computer systems execute programs and manipulate data, you will become a more effective programmer, especially in dealing with issues of debugging, performance, portability, and robustness. Topics covered include: the C programming language, data representation, machine-level code, computer arithmetic, elements of code compilation, performance optimization, and memory organization and management.

The class has two lectures a week and a weekly lab for hands-on learning and experimentation. There will be significant programming assignments and you can expect to work hard and be challenged. Your effort will pay off— by mastering the machine and raising your programming skills to the next level, you will have powerful mojo to bring to any future project!

The student

The prerequisite is programming and problem solving at the CS106B/X level. You should be an accomplished programmer who has practical C/C++ skills in using recursion, dynamic data structures (pointers, linked lists, trees, graphs), data abstraction, classic data structures (lists, stacks, queues, sets, maps), and standard algorithms (searching, sorting, hashing). You should have an appreciation of the intrinsic value of good engineering and design and you will be expected to produce well-decomposed, readable code.

The word on the street

From a former 107 student:

> "You know how Chinese restaurants have an asterisk next to some items on the menu? The asterisk warns the customer that the item is really hot and spicy. I think these asterisks are great, because sometimes the names can be ambiguous and it's a drag to get a really spicy plate when you didn't expect it. I think the Course Bulletin should have this feature. Some of the classes (ME101, CS107, etc.) would have an asterisk, and at the bottom of the page would be a warning the class is pretty spicy, so you know what you're getting into!"

Web site

If there is only one thing to take away from this handout, it's the URL for our course web site

http://cs107.stanford.edu

This is your go-to place for all things CS107— announcements, course materials, syllabus, assigned readings, office hour schedule, discussion forum, and more. This rest of this handout serves to hit a few highlights; refer our web site for more detail.

Instructor: Julie Zelenski
`zelenski@stanford.edu`
Gates 188 (first floor, B wing), phone 725-8596

Lectures: MF 1:30-2:50pm in 320-105

Lab: Various times MTWTh in Gates B08. The hands-on lab component is my favorite part of CS107. All students participate in a weekly 2-hour lab section, working in pairs on guided exercises. During the first week, we will post the lab schedule on the course web site and you will be able to signup for a lab from the available options. Lab signup is **first-come first-served**; best to move quickly once signups open if you don't have much schedule flexibility.

Readings: *Computer Systems: A Programmer's Perspective*, Bryant & O'Hallaron (required)
The C Programming Language, Kernighan & Ritchie (recommended)

Software: Our home base is the shared cluster of unix workstations (`myth)`. All software and tools used for labs and assignments is pre-installed on these hosts.

Exams: The midterm will be in-class Friday Oct 30th. The final will be Monday Dec 7th 12:15-3:15 pm. Before enrolling, verify that you can attend both the midterm and final exams as there will be **no alternate exams**.

Grading: Course grades will be determined by 50% coursework (programming assignments and labs) and 50% exams (midterm and final). To pass the course, both the coursework and exam aggregates must each be passing work. Restated, if the composite of your exams is failing, then you will fail the class in spite of an astounding performance on coursework or vice versa.

Honor Code: The Stanford Honor Code is an undertaking of the students and faculty to individually and collectively participate in upholding the highest standards for academic integrity. Please **review the full collaboration policy on our site** (`http://cs107.stanford.edu/collaboration.html`) for a thorough explanation of how it applies in this course. Transgressions are taken seriously and we refer all suspected violations to the Office of Community Standards.

Disabilities: Students who need an academic accommodation based on the impact of a disability should initiate a request with the Student Disability Resource Center (SDRC) in the Office of Accessible Education. SDRC staff will evaluate the request with required documentation, recommend reasonable accommodations, and prepare an Accommodation Letter dated in the current quarter. Students should contact the SDRC as soon as possible since timely notice is needed to coordinate accommodations. SDRC 563 Salvatierra Walk (phone: 723-1066).

Syllabus: A rough outline to give you an idea of what is planned—expect minor adjustments as we go. Programming assignments will be assigned ~weekly.

Week	Topics
1	Admin, intro to systems, C basics, UNIX development tools
2	C pointers/arrays, C-strings
3	C generics, void *, function pointers, bits and bytes
4	Integer and floating point representation, computer arithmetic
5	IA32: addressing, arithmetic
6	IA32: control function calls, runtime stack **Midterm**: **Fri Oct 30 in-class**
7	Compilation tool chain, linkers, loaders
8	Address space, dynamic memory management
9	Code optimization, memory hierarchy, caches
10	*Thanksgiving Recess*
11	Advanced topics, wrap
12	**Final**: **Mon Dec 7th 12:15-3:15pm**

Class quote: "*The motto of enlightenment is: Sapere aude! Have courage to use your own understanding!*" (Immanuel Kant, 1784) The transformation in understanding and confidence we can achieve together in 10 weeks is nothing short of amazing. Bring your curiosity and perseverance and join us the noble pursuit of enlightenment in the way of computer systems! ☺

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