

# Syllabus

version 7

## Instructor

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## Description

Introduction to principles of software engineering for mobile devices and best practices, including code reviews, source control, and unit tests. Topics include Ajax, encapsulation, event handling, HTTP, memory management, MVC, object-oriented design, and user experience. Languages include HTML5, JavaScript, Objective-C, and PHP. Projects include mobile web apps and native iOS apps.

## Note

Students are encouraged, but not required, to have a Mac (running Lion) as well as an iPad, iPhone, or iPod touch; students without a Mac will have access to Macs in labs on campus. Students will work on projects in pairs; students are encouraged to enroll with a friend.

## Prerequisite

Computer Science 50 or equivalent.

## Computer Science 164: Mobile Software Engineering

Harvard College

Spring 2012

### Expectations

You are expected to attend all lectures and labs and to meet, with the same partner for each, four milestones for each of four projects.

### Grades

A student must ordinarily meet all milestones in order to be eligible for a passing grade (*i.e.*, A to D-) unless granted an exception in writing by one of the course's heads.

Each project's proposal, design doc, style guide, and code reviews are evaluated primarily along axes of clarity and thoroughness. Each project's alpha is evaluated primarily along axes of scope. Each project's release is evaluated primarily along axes of scope, correctness, design, and style. Axes' weights may vary by project.

The course is not graded on a curve. The course does not have pre-determined cutoffs for final grades. Scores on projects' milestones may be normalized across graders at term's end. Each student's final grade is individually determined after input from the teaching fellows. Prior experience, remarkable effort, and upward trending may be considered.

Partners ordinarily receive the same letter grade at term's end, except in cases where one partner's contributions to projects fall short of expectations.

### Website

The address of this course's website is:

`https://www.cs164.net/`

Visit the course's website to watch videos, to get help, to download handouts and software, and to follow links to other resources.

## Books

No books are required for this course, but the below are among those recommended by the staff. Realize that free, if not superior, resources can be found on the course's website.

*Beginning iOS 5 Application Development*

Wei-Meng Lee

John Wiley and Sons, Inc., 2012

ISBN 978-1-118-14425-1

*Design Patterns: Elements of Reusable Object-Oriented Software*

Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides

Addison-Wesley, 1995

ISBN 978-0-201-63361-0

*Don't Make Me Think: A Common Sense Approach to Web Usability, Second Edition*

Steve Krug

New Riders Publishing, 2006

ISBN 0-321-34475-8

*Mythical Man-Month, The*

Frederick P. Brooks, Jr.

Addison Wesley Longman, Inc., 1995

ISBN 978-0-201-83595-3

*PHP in Action: Objects, Design, Agility\**

Dagfinn Reiersøl, Marcus Baker, Chris Shiflett

Manning Publications Co., 2007

ISBN 978-1-932394-757

*Pro JavaScript Design Patterns*

Ross Harmes, Dustin Diaz

Apress, 2008

ISBN 978-1-59059-908-2

*Programming in Objective-C, Fourth Edition*

Stephen G. Kochan

Pearson Education, Inc., 2012

ISBN 978-0-321-81190-5

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\* Out of print but available used.

## Lectures

Lectures take place in Harvard Hall 104 on Mondays from 1:00pm until 3:00pm.

Each lecture is filmed and made available within 48 hours in streaming and downloadable formats (MP3 and MP4). Once posted, these recordings remain available until semester's end. You are welcome to watch or listen to a recording if you are unable to attend some lecture in person. You are encouraged to watch or listen to these recordings for the sake of review.

A schedule of lectures, subject to change, appears below.

**Lecture 0: Introduction**

Mon 1/23

**Lecture 1: MVC**

Mon 1/30

**Lecture 2: Relational Databases**

Mon 2/6

**Lecture 3: Design Patterns**

Mon 2/13

**Lecture 4: Objective-C**

Mon 2/27

**Lecture 5: iOS**

Mon 3/5

**Lecture 6: iOS, continued**

Mon 3/19

**Lecture 7: iOS, continued**

Mon 3/26

**Lecture 8: Unit Tests**

Mon 4/2

**Lecture 9: Scalability**

Mon 4/9

**Lecture 10: Windows Mobile**

Mon 4/16

**Lecture 11: Security**

Mon 4/23

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### Projects

A schedule of deadlines for projects' milestones, subject to change, appears below. Extensions are not ordinarily granted.

#### Project 0: Staff's Choice of Web Apps

Mon	Tue	Wed	Thu	Fri
				2/3 Proposal
2/6 Design Doc, Style Guide				2/10 Beta
				2/24 Release

#### Project 1: Students' Choice of Web Apps

Mon	Tue	Wed	Thu	Fri
2/20 Proposal				
	2/28 Design Doc, Style Guide			
	3/6 Alpha			
				3/23 Release

#### Project 2: Staff's Choice of Native Apps

Mon	Tue	Wed	Thu	Fri
				3/23 Proposal
	3/27 Design Doc, Style Guide			
	4/3 Alpha			
				4/13 Release

#### Project 3: Students' Choice of Native Apps

Mon	Tue	Wed	Thu	Fri
	4/10 Proposal			
	4/17 Design Doc, Style Guide			
	4/24 Alpha			
			5/3 Release	

## **Sections**

Lectures are supplemented by weekly sections led by a teaching fellow. Sections provide you with opportunities to explore and discuss course materials in a more intimate environment, with only the teaching fellow and a handful of classmates present, as well as to dive into hands-on activities.

Each section is filmed and made available within 48 hours in streaming and downloadable formats (MP3 and MP4). Once posted, these recordings remain available until semester's end. You are welcome to watch or listen to a recording if you are unable to attend some section in person.

A schedule of sections appears on the course's website.

## **Design Reviews, Code Reviews, Office Hours**

Lectures are also supplemented by design reviews, code reviews, or office hours, depending on the week. Design reviews are opportunities to discuss your projects' designs with a teaching fellow. Code reviews are opportunities to review your projects' code with a teaching fellow. And office hours are opportunities for one-on-one assistance with your projects.

A schedule of design reviews, code reviews, and office hours appears on the course's website.

## **SEAS Design Fair**

From 11am until 4pm on Tue 5/1 in Maxwell Dworkin is the SEAS Design Fair, a school-wide display of projects designed by students in courses in Applied Mathematics, Computer Science, and Engineering Sciences. Not only is the SEAS Design Fair a venue at which to see classmates' projects and demo your own, it is an opportunity to mingle with students, faculty, and staff from across campus. Attendance is expected of all students. Family and friends are welcome to join.

## Academic Honesty

All work that you do toward fulfillment of this course's expectations must be the work of you and your partner. Collaboration with anyone other than the partner with whom you begin the semester is not permitted unless one of the course's heads approves a change of partner in writing. Partners must contribute equitably to each milestone: you may not implement most or all of some project's milestone and submit it on behalf of your two-person team.

Viewing or copying another individual's work (even if left by a printer, stored in an executable directory, or otherwise exposed) or lifting material from a book, website, or other source—even in part—and presenting it as your own constitutes academic dishonesty, as does showing or giving your work, even in part, to another student or soliciting the work of another individual. Similarly is dual submission academic dishonesty: you may not submit the same or similar work to this course that you have submitted or will submit to another. Nor may you provide or make available solutions to projects to individuals who take or may take this course in the future. Moreover, submission of any work that you intend to use outside of the course (*e.g.*, for a job) must be approved by the staff.

You may read and comment upon classmates' code toward fulfillment of projects' code reviews but only for classmates whose code is assigned to you by the course's staff for review. You may integrate ideas and techniques that you glean from your reviews of classmates' code and from classmates' reviews of your code into your own work, so long as you attribute those ideas and techniques back to your classmates, as with comments in your own code. As for classmates beyond your own partner and those with whom you're involved in reviews, you may discuss projects, including designs, but you may not share code. In other words, you may communicate with those classmates in English, but you may not communicate in PHP, JavaScript, or Objective-C. If in doubt as to the appropriateness of some discussion, contact the course's heads.

You may turn to the Web for instruction beyond the course's lectures and labs, for references, and for solutions to technical difficulties, but not for outright solutions to projects or portions thereof. However, failure to cite (as with comments) the origin of any code or technique that you do discover outside of the course's lectures and labs (even while respecting these constraints) and then integrate into your own work may be considered academic dishonesty.

All forms of academic dishonesty are dealt with harshly. If the course refers some matter to the Administrative Board and the outcome for some student is *Admonish*, *Probation*, *Requirement to Withdraw*, or *Recommendation to Dismiss*, the course reserves the right to impose local sanctions on top of that outcome for that student that may include, but not be limited to, a failing grade for work submitted or for the course itself.

## Acknowledgement

Computer Science 164 (CS164) plans to make video and audio recordings of this course's lectures and/or labs and/or other events, with the aim of making the content of the course more widely available. The recordings, or edited versions of them, may be made available to other Harvard students, to students at other educational institutions, and to the broader public, via the Internet, television, DVD, or other means. It is also possible that video and audio recordings of CS164 may be used to make other derivative works in the future. Students may elect not to take part in this CS164 recording and dissemination project (the "Project"), and may still participate fully in CS164.

By enrolling in this course, you affirm that you understand that, if you do not wish to be included in the video recordings of CS164, you must sit in the "no film" section of the classroom. From the "no film" section, you will be able to participate fully in CS164 discussions, and no video recording of you will be used as part of the Project. Though you understand that your name and/or voice might still be recorded by microphones outside of the "no film" section. You recognize that, if you choose at any time to sit in the part of the classroom that is being filmed or walk within sight of any cameras, you will be consenting to be recorded on video for use in the Project. In that event, you agree that, even if you do not sign any other authorization, CS164 may make video and audio recordings of you and your participation, and may use the recordings as it sees fit without further obligation or liability to you.

By enrolling in this course, you affirm that you are at least 18 years of age and competent to agree to these terms.<sup>†</sup> This Acknowledgement is a binding agreement and is agreed to as a document under seal governed by the laws of the Commonwealth of Massachusetts.

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<sup>†</sup> Students who are not at least 18 years of age may still enroll but must first alert the course's instructor via email.