



UC Berkeley EECS CS10 : The Beauty and Joy of Computing Spring 2012



QuickLinks

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[Piazza](#)
[BYOB](#)

[bSpace](#)
[Webcasts](#)

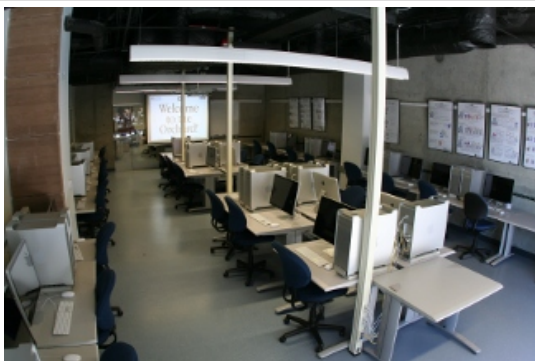
Overview

CS10, *The Beauty and Joy of Computing*, is an exciting new course offered by the [UC Berkeley EECS Dept.](#) Computing has changed the world in profound ways. It has opened up wonderful new ways for people to connect, design, research, play, create, and express themselves. However, just using a computer is only a small part of the picture. The real transformative and empowering experience comes when one learns how to program the computer, to translate ideas into code. This course will teach students how to do exactly that, using [BYOB](#) (based on [Scratch](#)), one of the friendliest programming languages ever invented. It's purely graphical, which means programming involves simply dragging blocks around, and building bigger blocks out of smaller blocks.



Fall 2009 students work together using pair programming

Fall 2009 students [pair programming](#) in Scratch.



Our labs are held in the Apple Orchard, which is not only the newest lab on campus with the fastest machines, but also has the most natural light!

But this course is far more than just learning to program. We'll focus on some of the "Big Ideas" of computing, such as abstraction, design, recursion, concurrency,

simulations, and the limits of computation. We'll show some beautiful applications of computing that have changed the world, talk about the history of computing, and where it will go in the future. Throughout the course, relevance will be emphasized: relevance to the student and to society. As an example, the final project will be completely of the students' choosing, on a topic most interesting to them. The overarching theme is to expose students to the beauty and joy of computing. This course is designed for computing non-majors, although interested majors are certainly welcome to take the class as well! We are especially excited about bringing computing (through this course) to traditionally under-represented groups in computing, i.e., women and ethnic minorities.

Some context: in the Fall of 2009, we piloted a 2-unit version of this course as the freshman/sophomore seminar [CS39N: The Beauty and Joy of Computing](#) to 20 students. [It was such a success](#) that we decided to move ahead to make this course our new computing course for non-majors, replacing the venerable [CS3L](#) and [CS3S](#). Last fall (2010) was a 90-person pilot and we're continuing to grow the course as word spreads to more students. We're continually replacing the weakest parts of the curriculum and hope you'll enjoy!

We will be using Pair Programming, described best by Laurie Williams, a computer science professor at North Carolina State University: "Two programmers working side-by-side, collaborating on the same design, algorithm, code or test. One programmer, the driver, has control of the keyboard/mouse and actively implements the program. The other programmer, the observer, continuously observes the work of the driver to identify tactical (syntactic, spelling, etc.) defects and also thinks strategically about the direction of the work. On demand, the two programmers can brainstorm any challenging problem. Because the two programmers periodically switch roles, they work together as equals to develop software."

UC Berkeley CS10 (The Beauty and Joy of Computing) Testimonial #01 [720p HD]



18 student testimonials about CS10!

News

- 03-08 Midterm Project Progress Report Submission Form**
Now available [Here](#). Only submit ONE per group.
- 02-29 Midterm Project Proposal Submission Form**
Now available [Here](#). Only submit ONE per group.
- 01-29 bSpace set up**
You should now have access to the bSpace course: "CS10 Sp12." If you don't see it, please let us know right away!
- 01-24 Section #8 - it's official!**
Please see the weekly schedule below for the finalized days and times.
- 01-23 Enrollment key restriction removed for UC-WISE / sage.cs / The labs**
The Spring 2012 (online) lab site was set up with an enrollment key (as many of you found out when trying to "enrol" [sic] in the course). The key has been removed, so be sure to click the "enrol [sic] me in this course" link on the left-hand side of the page (after you log in).
- 01-19 New section, first lab tomorrow (Friday the 19th at 9am)**
As the new section's (8's) first lab has already passed (Wednesday morning), it's important to go to tomorrow's (Friday's) lab at 9am if you want to attend the 8th section and/or haven't been to lab yet this week.
- 01-18 Welcome to CS10, everyone!**
Those of us on staff are really excited about sharing the Beauty and Joy of Computing with you all, and are looking forward to a great semester! -The Staff

Webcasts

Webcasts of our lectures are freely available online!

- [Spring 2012](#)
- [Fall 2011](#)
- [Spring 2011](#)
- [Fall 2010](#)

Calendar

Weekly Schedule

NOTE: Discussion time for section #8 (108) is still TBD, so if you are wait-listed, please go to any of the existing Friday sections for the first week or two.

Hour	Monday	Tuesday	Wednesday	Thursday	Friday
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9:00am					Lab 018 (Samir Makhani) 200 Sutardja Dai
		Lab 014 (Navin Eluthesen) 200 Sutardja Dai	Lab 018 (Samir Makhani) 200 Sutardja Dai	Lab 014 (Navin Eluthesen) 200 Sutardja Dai	Discussion 101 (Aijia Yan) 320 SODA
10:00am					Lab 018 (Samir Makhani) 200 Sutardja Dai
		Lab 015 (Luke Segars) 200 Sutardja Dai		Lab 015 (Luke Segars) 200 Sutardja Dai	Discussion 102 (Yaniv (Rabbit)) 320 SODA
11:00am					Discussion 103 (Yaniv (Rabbit)) 320 SODA
12:00pm					Discussion 104 (Navin Eluthesen) 320 SODA
		Lab 016 (Pierce Vollucci) 200 Sutardja Dai		Lab 016 (Pierce Vollucci) 200 Sutardja Dai	Discussion 108 (Samir Makhani) 7 Evans
1:00pm					Discussion 105 (Luke Segars) 320 SODA
2:00pm					Discussion 106 (Pierce Vollucci) 320 SODA
3:00pm	Lecture 10 Evans	Lab 017 (Navin Eluthesen) 200 Sutardja Dai	Lecture 10 Evans	Lab 017 (Navin Eluthesen) 200 Sutardja Dai	Discussion 107 (Navin Eluthesen) 320 SODA
4:00pm	Lab 011 (Aijia Yan) 200 Sutardja Dai		Lab 011 (Aijia Yan) 200 Sutardja Dai		
5:00pm					
6:00pm	Lab 012 (Yaniv (Rabbit)) 200 Sutardja Dai		Lab 012 (Yaniv (Rabbit)) 200 Sutardja Dai		
7:00pm					
8:00pm	Lab 013 (Yaniv (Rabbit)) 200 Sutardja Dai		Lab 013 (Yaniv (Rabbit)) 200 Sutardja Dai		
9:00pm					

Semester Schedule (subject to change)

- **These readings are required, but are challenging - you should understand the "big idea" concepts, rather than the technical details.**
- **These readings are optional (but recommended).**

Week	Days in 2012	Readings (Sa/Su)	Lecture 1 (M)	Lab 1 (M/Tu)	Lecture 2 (W)	Lab 2 (W/Th)	Discussion (F)	HW & Projects Due
1	Jan 16 - Jan 21	<ul style="list-style-type: none"> • Prof. Harvey's Intro to Abstraction • Why Software is Eating the World • Is Abstraction the Key to Computing? • Designing Games with a Purpose (GWAP) • Justices Split on Violent Games • Kinect's Future • a Game Controller in Everything • Animating a Blockbuster • More readings on video games • Program or Be Programmed (Video: Author 	MLK Holiday (extended)	MLK Holiday (extended)	Abstraction	Broadcast, Animations, & Music	Welcome, Introductions, and Expectations	
2	Jan 23 - Jan 28		3D Graphics	Loops and Variables	Video Games	Random, If, & Input	Anatomy of a Computer & The Power of Binary	Homework 0 Friday at 11:59pm
	Jan 30 -				Programming			Homework 1

3	Feb 04	Speech • Scratch: Programming for All (CACM) • BtB Chapter 1	Functions	BYOB	Paradigms	Lists I	Video games	Friday at 11:59pm
4	Feb 06 - Feb 11	• How Algorithms Shape Our World	Guest Lecturer TA Luke Segars: Algorithms I	Lists II	Algorithms II, Order of Growth	Algorithms	Lists & Algorithms	Homework 2 Friday at 11:59pm
5	Feb 13 - Feb 18	No Reading (QUEST) Quest Review: Sunday, 6-9pm, 2050 VLSB	Quest (in-class exam -- lab sections 4-8 go to 390 Hearst Mining)	Algorithm Complexity	Guest Lecturer TA Yaniv Assaf: Concurrency	Concurrency	Algorithms & Algorithmic Complexity	
6	Feb 20 - Feb 25	• How Moore's Law Works • Free Lunch is Over • Spending Moore's dividend (CACM)	Presidents Day (extended)	Presidents Day (extended)	Recursion I	Recursion I	Recursion, Project Introduction, and Homework 3	Homework 3 Friday at 11:59pm
7	Feb 27 - Mar 03	• BtB Chapter 2 • Computing as Social Science • BtB Chapter 3 • BtB Chapter 4	Social Implications I	Project Work	Guest Lecturer TA Aijia Yan: Recursion II	Recursion II	Recursion Revisited	
8	Mar 05 - Mar 10	• Reading Segment 1 • BtB Chapter 4 • Reading Segment 2 • Living in a Digital World • BtB Chapter 5 • Reading Segment 1 • BtB Chapter 5 • Reading Segment 2 • BtB Chapter 5	Guest Lecturer Gerald Friedland: Social Implications II	Project Work	Guest Lecturer Bjoern Hartmann: HCI	Recursion III	Social Implications of Computing	
9	Mar 12 - Mar 17	• Reading Segment 3 • BtB Chapter 6 (27-37) • Data Explosion Creates Revolution	Game Theory	Project Work	Guest Lecturer Raffi Krikorian: Twitter	Applications That Changed The World	Midterm Prep	Midterm Project (and some general tips.) Friday at 11:59pm
10	Mar 19 - Mar 24	No Reading (MIDTERM) Midterm Review: Sunday, 6-9pm, 2050 VLSB	Guest Lecturer Anna Rafferty: Artificial Intelligence	Online Midterm Exam	Guest Lecturer TA Luke Segars: Applications that Changed the World	Study for Paper Midterm Exam, 3/22 155 Dwinelle, 6-8pm (Info) (Histogram)	Artificial Intelligence	
11	Mar 26 - Mar 31	No Reading (Break)	Spring Break	Spring Break	Spring Break	Spring Break	Spring Break	
12	Apr 02 - Apr 07	• BtB Chapter 7 • BtB Chapter 8	Lambda + HOFs I	Lambda + HOFs I	Lambda + HOFs II	Lambda + HOFs II	HOFs & Lambdas	Blog Entry Sunday at 11:59pm
13	Apr 09 - Apr 14	• What is Cloud Computing? (Video) • A Berkeley View of Cloud Computing	Distributed Computing	Distributed Computing	Guest Lecturer Prof Kathy Yelick: Saving the World with Computing (CS + X)	Project Work	HOFs & Lambdas Revisited	Blog Comments Friday at 11:59pm Project Proposal Friday at 11:59pm
14	Apr 16 - Apr 21	• What is IBM's Watson? • The Great Robot Race (Video) • Computers Solve Checkers -- It's a Draw • Brian Harvey's AI notes • The First	Limits of Computing	Project Work	Future of Computing	Project Work and Peer Review	Open Topic	Project Peer Review Write-up Friday at 11:59pm

		Church of Robotics <ul style="list-style-type: none">• The Thinking Machine (Video)• Computer Pioneer Alan Turing• Why is Quantum Different?• Quantum Leap• Twenty Top Predictions for life 100 years from now• Apple's 1987 Knowledge Navigator (Video)• Microsoft's view of productivity in 2019 (Video)• The Future of Augmented Reality• Apple's Siri• BtB: Conclusion						
15	Apr 23 - Apr 28	Guest Lecturer Prof Armando Fox: 'Cloud Computing'	Project Work	Summary and Farewell	Online Final Exam	Final Thoughts	Final Project (and same general tips.) Friday at 11:59pm	
16	Apr 30 - May 05	No Reading (RRR) No Reading (Final)	RRR Week	RRR Week	RRR Week	RRR Week		
17	May 07 - May 12	Final Review: Sunday, 6-9pm, 2050 VLSB	Finals Week	Finals Week	Paper Final Exam May 9th, 7-10 pm (10 Evans) Supplementary Handout	Finals Week	Finals Week	
		<ul style="list-style-type: none">• Reading Slides• Programming Slides						

Staff

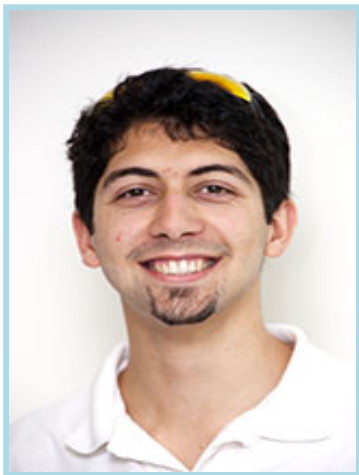
Lecturer



Dan Garcia ([bio](#))
ddgarcia@cs.berkeley.edu
777 Soda, (510) 517-4041
OH: F 2-3pm in 777 Soda

(but please first check his [Travel Schedule](#) to be sure he's here that week!)

Teaching Assistants



Pierce Vollucci ([bio](#))
cs10-ra@inst.eecs.berkeley.edu
OH : Th 3-4pm, Tables Outside Lab



Luke Segars ([bio](#))
cs10-tc@inst.eecs.berkeley.edu
 360 Hearst Mining
OH : W 4-5pm, Tables Outside Lab



Navin Eluthesen ([bio](#))
cs10-ta@inst.eecs.berkeley.edu
OH : M 2-3pm, 283E Soda
 & F 3-4pm, 611 Soda



Yaniv Assaf, aka Rabbit ([bio](#))
rabbbit@gmail.com
OH : Th 5-6pm, 411 Soda
 & F 1-2pm, 200 SD Lab



Aijia Yan ([bio](#))
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OH : F 11am-12pm, Tables Outside Lab



Samir Makhani ([bio](#))
makhani@berkeley.edu
OH : F 2-3pm, 200 SD Lab

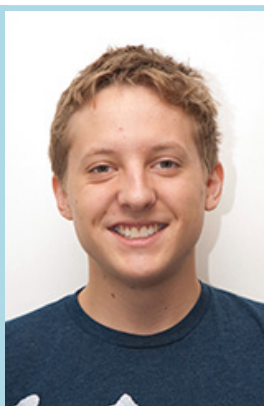
Readers



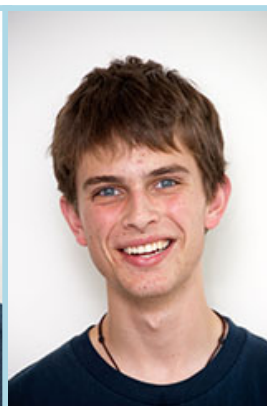
Shreya Lakhan-Pal ([bio](#))
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Kylan Nieh ([bio](#))
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Head Grader Max Dougherty ([bio](#))
cs10-rf@inst



Christian Pedersen ([bio](#))
cs10-rc@inst



Ian Birnam ([bio](#))
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Grading

For the most part, we would prefer to teach this course *without* grades. What a wonderful concept, learning for learning sake! However, even though we can't change the "system" overnight, we can create grading policies that support learning as much as possible. The various course activities will contribute to your grade as follows:

Activity	Course Points	Percentage of Total Grade
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Weekly Quizzes and Homework	60	15%
Paper	60	15%
Midterm Project	60	15%
Final Project	60	15%
Quest	20	5%
Midterm	60	15%
Final Exam	80	20%

How We'll Calculate Your Grade

Your letter grade will be determined by total course points, as shown in the table below. There is no curve; your grade will depend only on how well you do, not on how well everyone else does. Incomplete grades will be granted only for dire medical or personal emergencies that cause you to miss the final exam, and only if your work up to that point is satisfactory.

Points	Grade
390-400	A+
370-389	A
360-369	A-
350-359	B+
330-349	B
320-329	B-
310-319	C+
290-309	C
280-289	C-
240-279	D
< 240	F

Resources

- Λ [BYOB : Build Your Own Blocks](#)
- Λ [Scratch Forums](#)
- Λ [Blown to Bits](#)
- Λ [Debugging Rules!](#)
- Λ [UC Berkeley](#)
- Λ [College of Engineering](#)
- Λ [Department of Electrical Engineering & Computer Sciences](#)
- Λ [Webcast archive of 2010Fa lectures](#)
- Λ [Solutions to Lab Exercises](#)

Contact [Webmaster](#) 2014-06-28@01:20:40 PDT

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