

BJC.1x

The Beauty and Joy of Computing

Syllabus: Course Information and Policies

Fall 2015

1. Course Description

Beauty and Joy of Computing (BJC) is a CS Principles course whose guiding philosophy is to meet students where they are, but not to leave them there. It covers the big ideas and computational thinking practices required in the AP Computer Science Principles curriculum framework using an easy-to-learn blocks-based programming language called Snap! (based on Scratch), and powerful computer science ideas like recursion, higher-order functions and computability. Through the course, students learn to create beautiful images, and realize that *code itself* can be beautiful. This is NOT just a programming course; you'll learn many other CS Principles big ideas: creativity, abstraction, data and information, algorithms, the Internet, and global impact. When discussing the social implications of computing, we try to balance optimism about technology with a critical stance toward any particular technology.

In the course, you'll read from the textbook *Blown to Bits* as well as articles from the web, discuss them on the forums, watch inspiring videos, and learn fundamental principles of computer science and programming through labs that will guide through learning Snap! There will be quizzes along the way, and a final exam. You are strongly encouraged to use the Piazza forum to ask and answer questions and help each other learn, so that the ten thousand of you taking this course form one big learning community.

There are no prerequisites for the course.

We are offering BJC as four "MOOClets", BJC.1x through BJC.4x. All of the CS Principles material is covered in the first three, with the last being wonderful, but advanced computer science ideas we affectionately call our "BJC secret sauce". Here is the duration and briefly what each contains; we hope you will continue on with the other MOOClets after this one.

- **BJC.1x: Starting to Think Like a Computer Scientist and Develop Complex Programs.** 7 weeks (5 weeks of curriculum, 2 week "fun programming" project). *CS Principles Big Ideas: Creativity, Abstraction, Algorithms, Programming, Global Impact*
- **BJC.2x: Lists, Algorithms, and Complexity.** 8 weeks (5 weeks of curriculum, 3 week "research a computing innovation" project). *CS Principles Big Ideas: Abstraction, Algorithms, Programming, Global Impact*
- **BJC.3x: Data, Information and the Internet.** 8 weeks (5 weeks of curriculum, 3 week programming project). *CS Principles Big Ideas: Abstraction, Algorithms, Programming, Global Impact*

- **BJC.4x: Recursion and Higher-Order Functions.** 5 weeks (only curriculum, no project).

Having fun is an explicit course goal. We hope you enjoy this course as much as the thousands of students who have taken it before you!

2. Development and Teaching Staff

BJC.1x is brought to you by the hard work and dedication of an army of outstanding faculty, staff and students over two years of development. Some have finished their work before the course launch, others (especially the Forums team) will continue to help in the fall. We would be remiss if we did not thank others in the BJC team (UC Berkeley Teaching Professor Emeritus Brian Harvey, NC State Professor Tiffany Barnes, UC Berkeley Graduate Student Omoju Miller, UC Berkeley Research Associate Nate Titterton, all the folks at EDC) who helped with the development of the BJC curriculum.

- **Instructor:** UC Berkeley Teaching Professor Dan Garcia
- **Project Managers:** UC Berkeley Graduate Lauren Mock, Akhila Raju and Kunal Marwaha
- **Technical Lead:** UC Berkeley Graduate Student Michael Ball
- **Auto-grading:** UC Berkeley Graduate Max Dougherty (lead), Undergraduates Nidhi Swamy, Tina Huang, Patrick O'Halloran, David Allen, Yifat Amir, Ziyue Chen, Alex Zhang, and Siddharth Karamcheti
- **Course Builder:** UC Berkeley Graduate Students Michael Ball and Peter Sujan (leads), Undergraduates Caren Thomas, Nick Rose, Kate Pham, and Sidharth Goel
- **Data and Analytics:** UC Berkeley Graduate Student Peter Sujan
- **Exams:** UC Berkeley Graduate Jeff Snowiss
- **Piazza Forums:** UC Berkeley Undergraduates Katherine McGauley (lead), Ryo Mayes, Ryan Riddle, Sneha Dilip, Mridula Dilip, many other volunteers forthcoming
- **Peer Studio:** UC Berkeley Undergraduate Amaan Rahim
- **SPOC Support:** UC Berkeley Undergraduate Yuan Yuan
- **Videos:** UC Berkeley Staff Eric Arvai, Undergraduates Lara McConnaughey (lead), Ginger Engel, Mridula Dilip, Jiachen Hu, Annie Lockmiller, and Emily Pedersen

During the fall when BJC.1x is running, the instructor and course TAs will be available on Piazza to moderate the forums. They will answer questions about the curriculum, help solve technical challenges, and participate in discussions.

3. Programming Language

[Snap!](#) is an entirely browser-based blocks language supported on Chrome, Firefox, and Safari. As of this writing, we have found the best performance using Chrome.

4. Course Materials

There are no textbooks or external materials that you need to purchase for this class because we provide them all for you. All lecture videos, slides and reading assignments are posted within edX.

5. Learning Goals

- Build a mobile app (or two) using Snap!
- Design procedures to draw, make music, animate, and interact with the user.
- Use loops to repeat similar steps of code.
- Create procedures inside procedures and loops within loops.
- Explore mathematics of computer science: random, modulo, and logical operators.
- Analyze the impact of technology on our culture and safety.
- Begin thinking about the structure of programs and the structure of data.
- Become fluent with conditional statements and the use of local variables in programs.
- Analyze computing innovations and discuss privacy implications.
- Have fun!

6. Time Commitment and Expectations

You are expected to contribute 4-5 hours per week on this course. This involves doing all the activities listed in a week segment. You are expected to finish the work for a week (Sundays 11:59 PM PST) before the next week starts. We will release the next week's material on Fridays at 11:59 PM PST, so you can start work on it over the weekend.

We may be making tweaks to course content based on student feedback, or if we discover errors or omissions, and will make it clear what those changes are. We will also be sharing weekly "computing in the news" stories with you, to show you how computing is affecting your world that week.

7. Activities

These are the activities you'll do in BJC.1x. A *typical* week will have one or two reading assignments (they can also be videos), a reading quiz and forum participation expected per reading assignment, lecture videos and quizzes, and lab exercises. You should also fill in your Bio on Piazza (our course discussion forum) and respond to survey requests. In the later weeks of the course, there will be a homework and project assignment.

- We ask that all students fill in a **Piazza Bio**, which involves going to Piazza (our course discussion forum), uploading a photo of your face and answering some student profile questions. These are intended to make the class seem like a community, and allows other learners to get to know you. *If you are under 18, please get the permission of your parent or guardian before you upload anything.*
- We will give you three **Surveys** this semester, one at the start, one after the curriculum is finished (after 5 weeks), and one at the end of the course after you've finished your *Fun Programming Project*.
- **Readings** are given out once a week. By the end of the week, you are expected to be able to answer our **Reading Quizzes**, which test your reading comprehension. You are expected to participate in the **Piazza Reading Discussion** with your small group once per week. You are not required to make any other posts on Piazza, but feel free to use it as a resource if you have questions, and please answer each others' questions!
- **Lectures** cover material that will provide the conceptual basis for lab work. Teaching Professor Dan Garcia is the primary lecturer, and throughout the course of the semester, there will be several guest speakers in fields that are relevant to the topics covered in the class. There is a **Lecture Quiz** at the end of each short Lecture video.
- **Lab Exercises** can be completed on at any time. You are highly highly encouraged to complete lab work with a partner (you can find one on Piazza)! While your lab work isn't directly graded for correctness (because that's where the learning happens, where it's ok to be wrong), when you believe you are finished, you will submit your code for instant feedback and to earn participation points. There are also **Lab Quizzes** sprinkled throughout the lab, which test your understanding of the material at that point.
- **Homework** assignments have varying degrees of complexity, meant to illustrate and explore topics you've been learning. In BJC.1x, there is one homework assignment called "Word Guessing Game". You are encouraged to (verbally) *discuss* the homework with other students, but submitted work must be entirely your own. Please see the section on Academic Honesty which gives some details about collaboration.
- **Projects** are larger assignments that you design intended to teach you how to combine ideas from the course in interesting ways. Programming projects are your chance to build something you want to! You are encouraged to complete these projects in pairs. For BJC.1x, you will complete the "Fun Programming Project" over a week and a half, and submit it for **Peer Grading**. This will give you a chance to see other students' projects, give them rapid feedback, as well get the feedback from others.

- There is one **Final Exam** given at the end of the MOOClet that will test your knowledge of the course material. There will be practice problems made available to you before the exam so that you can get a feel for what to expect.

8. Grading Policy

Your course grade is computed using a point system with a total of 100 points. The grade scale, as well as the breakdown of points per assignment can be found below. You can check your progress in BJC.1x by viewing the “Progress” tab on the top toolbar of the edX window. Assignments and grades will be regularly updated.

You need to earn 75% of the points to earn a certificate. Every part of this course that counts toward your “grade” allows for *resubmission*, so if you didn’t get it right the first time, you can resubmit a corrected version later for full credit. We believe all of our BJC.1x learners can succeed, if they have the time and can put in the effort. So don’t worry about grades and enjoy the learning!

Activity	Value
Piazza Bio and Surveys	5%
Reading Quizzes	5%
Lecture Quizzes	5%
Piazza Reading Discussion	10%
Homework - Word Guessing Game	10%
Fun! Programming Project + Peer Grading	20%
Final Exam	20%
Lab Exercises and Quizzes	25%
Total	100%

9. Academic Policy and Forum Etiquette

Your first and most important resource for help in learning the material in this course is your fellow students. Starting on the first day of class, we encourage you to find a partner to work with. There are more than ten thousand students in the class, and fewer than one hundred TAs, so helping each other learn is the only way these massive courses scale.

When you have a question, first search Piazza (our course discussion forum) to see if your question was asked before. If not, post your questions and make sure to select the appropriate folder – that helps us direct the question to the appropriate TAs.

With the obvious exception of your homework and exam, we encourage you to discuss all of the course activities with your friends and fellow students as you are working on them. You will definitely learn more in this class if you work with others than if you do not. Ask questions, answer questions, and share ideas liberally on Piazza. For your homework and exam, we expect you to hand in your own work. Do not post your solutions on Piazza. The course staff works hard to put together this course, and we ask in return that you respect the integrity of the course by not misrepresenting your work.

In terms of Forum Etiquette, we are “remixing” the policies of the [Scratch Forums](#):

We need everyone’s help to keep BJC.1x a friendly and creative community where people with different backgrounds and interests feel welcome.

- **Be respectful.** *When sharing projects or posting comments, remember that people of many different ages and backgrounds will see what you’ve shared.*
- **Be constructive.** *When commenting on others’ projects, say something you like about it and offer suggestions. (This will happen formally when you’re doing Peer Grading, but the principle applies to any work from other students)*
- **Share.** *You are encouraged to remix projects from other students – and encourage you to allow others to remix your projects. Be sure to give credit when you remix.*
- **Keep personal info private.** *For safety reasons, don’t post contact info like phone numbers or addresses. Everyone under the age of 18 needs to get permission from their parent or guardian to share other information.*
- **Be honest.** *Don’t try to impersonate other students, spread rumors, or otherwise try to trick the learning community.*
- **Help keep the site friendly.** *If you think a project or comment is mean, insulting, too violent, or otherwise inappropriate, send us a private message to let us know about it.*

We welcome people of all ages, races, ethnicities, religions, sexual orientations, and gender identities.

10. Last Words

We wish you the best of luck and hope that you have an amazing time in BJC.1x. The course is fun, as well as difficult, and sometimes it’s fun because it’s difficult!