

Camp Code < Learn to Think Like a Programmer in 2 Weeks! >

July 10-21 2023

Mon-Fri 8:30-11:20 am

Metcalf Research Building 104

Course Number 10231

Instructors

[Haley](#) Keglovits

Office Hours: Time/Location TBD, See Calendar

TAs: [Kei](#) Yoshida and [Annika](#) McDermott-Hinman

Office Hours: Time/Location TBD, See Calendar

Course Description

The goal of this course is to introduce the fundamentals of computer programming: what it is, where it is used, who does it, and how YOU can do it too! Computer Science (CS) is fast becoming one of the most popular areas of study at colleges worldwide (including Brown University!). It is popular for its widespread application to industry, non-profit, and educational sector post-graduate jobs, as well as its implications in a world that is growing more and more reliant on advances in digital technology. However, because of its relatively new conception compared to other STEM majors like math or biology, many high schools do not offer introductory courses in CS or have associated resources, so it can be hard to know whether coding is something you'd be interested in.

Using the programming language Python, this course will cover the fundamentals of coding. Topics will include logical thinking, how to store data in code, what functions are and how to leverage them, working with code others have written, sharing your own code, and analyzing and visualizing large datasets. You will be exposed to all the necessary syntactic knowledge you need to become proficient at coding in Python, in addition to gaining an appreciation for the many ways coding is used in the real world. Python is used for its readability and popularity for both college courses and employers.

Coursework will include collaborative labs, interest-driven projects, and opportunities for individual exploration. Through this course, you will not only learn the basics of coding, but you will also be introduced to the larger coding community and become experienced in writing, fixing, and improving your own code. Like learning a new spoken/written language, learning a coding language works best in an immersive environment so this summer course provides a perfect opportunity to begin your programming journey, and a supportive cohort to begin that journey with.

Who should take this course?

This course requires no coding background or prior knowledge, and is in fact designed for complete beginners. Students with any level of background are welcome, but those who already possess a strong foundation in coding (for example, those who have taken an AP CS class or equivalent) may benefit more from other courses in the catalog.

Course Goals

By the end of this course, you will be equipped with the tools to take your coding to the next level, whether that be a new language, more advanced topics or classes, or writing your own Python code to help automate your life! With a strong computational and theoretical foundation in programming, a whole new world of personal, educational, and professional opportunities will open up to you.

Learning Outcomes

Students who complete this course will be able to:

- Translate programming goals into formal language with enough detail for a computer to run
- Practice and build the skills to learn new packages/languages and solve novel coding problems without use of a formal textbook or class
- Use a structured approach for researching, designing, writing, and testing code to solve novel problems, both alone and in collaboration with peers
- Program solutions to tasks/problems from their own disciplines or real world experiences, and identify parts of their life/discipline which already rely on programming

Course Outline and Activities

Time Allocation

I expect this course to total approximately 55 hours of work-time. This includes:

- 0.5 hours (~15 minutes weekly) reading announcements and assignments posted on Canvas
- 30 hours in class (includes in-class activities)
- 25 hours (2-3 hours per night) of preparation for the following class and working on your final project. This will likely include time spent in optional office hours

All course material will be distributed through Canvas. Each day's activities will be submitted through this medium. Any lecture slides will be made available the day before via canvas.

Schedule of Topics

Date	Topic
Monday July 10	Intro to Programming, Variables, and Basic Operations
Tuesday July 11	Using Logic: Expressions vs. Statements and If/Else
Wednesday July 12	For and While Loops
Thursday July 13	Functions, Lists, and Dictionaries
Friday July 14	Apply What You Learn: Pokemon Tournament
Monday July 17	Packages, External Data, Coding Community
Tuesday July 18	Numpy and Matplotlib
Wednesday July 19	Pandas and Datasci
Thursday July 20	Programming and Society, Work Session for Final Project
Friday July 21	Final Project Presentations

Course Performance

Per the Brown Pre-College program, you will receive a course performance report and a Certificate of Completion in the mail in September. We will base our written reports in line with the distribution below. For more details on course completion materials see the Brown Pre-College website:

<https://precollege.brown.edu/accepted-students/summerbrown-prebacc-campus>

Tool	Weight	Dates
Participation & In Class Activities	50%	Throughout Course
Out-of-class Assignments	30%	Throughout Course
Final Project	20%	July 21st

Details on Assignments

Final Project: For your final project you will visualize a dataset using the Python skills you have acquired during the course. Details for this assignment will be released on July 14th (Day 5) and will be reviewed in class.

In-Class Activities: During the course you may be asked to work in small groups or individually to complete reflections, small programming assignments, and other course activities. Please plan to bring your laptop to class with you to complete these, along with a charging cord if you anticipate needing to charge the machine during a three hour session.

Out-of-class Assignments: Between classes, we will provide activities to supplement and practice what you have learned that day in class. These should take about 2-3 hours per evening, and we will offer office hours (see info below!) for you to complete them during if you want assistance or to work in a group.

Classroom Environment

It is my intention to make this course accessible and valuable for all students, regardless of their background in computer science or personal identity. I aim to promote discussions and collaborations which harness and benefit from the diversity of students who will be in the classroom. However, intentions are not always met and it is the impact of my teaching practices which will matter for your learning and growth as programmers. With this in mind, if there are things you think I should start or stop doing to create a more inclusive classroom or syllabus, I hope that you feel comfortable bringing your ideas to me or a TA so that we can work together to improve this course. And if anyone in our class makes you feel like you do not belong in CS or are not a “real” programmer, I hope you can bring that information to me so I can take appropriate action – you DO belong here as much as anyone else.

Respectful Learning Environment

In addition to the scholarly expectations of this course are the interpersonal ones. You are expected to treat your fellow students with respect during class discussions, office hours, and when collaborating with them on projects. This means listening to their ideas and allowing for a varied group of voices to participate in class, and it also means respecting their position in the room as learners just like you. See academic integrity section below for more information about working together, which will be heavily encouraged. But in this class, working together does not mean using the answer from whomever solves the problem the quickest. It means helping each other come to the solution together, appreciating that our peers may be faster or slower on any given topic than ourselves, and not robbing fellow students of the time they need to understand and execute code themselves. This will also allow for you to see multiple

solutions to a problem – there is always more than one way to code something! Please treat your classmates the way you would want to be treated, as someone who is putting in the time and deserves to learn from this course.

Office Hours

Office hours are designated times that your instructors set aside to engage with questions that may come up during class or on assignments. They are on a drop-in basis (meaning you do NOT have to stay for the whole hour - you can come and go as you please - and you do not need to tell us ahead of time you will come) and are for your benefit. Office hours are a staple of all college courses and are an incredibly helpful resource to get to know your instructors and engage with the material in a deeper way. They're also a great opportunity to work on your assignments with your peers. Please stop in to see us during our hours!

Academic Integrity

All students, faculty and staff are expected to follow the University's guidelines and policies on academic integrity. For students, this means following the standards of academic honesty when writing assignments, citing and using source material appropriately and collaborating with fellow students. Ensure that the work you submit for grading represents your own honest efforts. Plagiarism representing someone else's work as your own or submitting work that you have previously submitted for marks in another class or program is a serious offense that can result in sanctions. See Brown's Pre-College Program code of conduct for the University's expectations on academic honesty and integrity: <https://precollege.brown.edu/policies#conduct>

Copied material (code or otherwise) without citation of the author, whether verbatim or not, will be treated as plagiarism. If you have any questions about plagiarizing code, please speak with me.

Materials and Accessibility

This course recommends a laptop for course-related programming, games/simulations, etc. Please note that some devices (e.g., Chromebooks) do not allow software downloads onto a desktop and so will not accommodate the specific needs of this course. If you have questions about this requirement please reach out to precollege@brown.edu. The course does not use any textbook. All software will be either installed in class or work in your browser and not require installation. We will discuss recommended browsers during our first day and use office hours to ensure everyone has a working machine.

Students with diverse learning styles and needs are welcome in this course. Students may request accommodations for this course based on a learning, psychological and/or physical disability, including medical conditions, temporary injuries

and significant food allergies. Please be aware that all accommodation requests will be considered, however there may be limits to what can be provided without sufficient notice.

The Division of Pre-College and Summer Undergraduate Programs recommends submitting requests (via the Medical History and Health Authorization Form) a minimum of two weeks in advance of the program start date. Please email accessibility@brown.edu or call 401-863-1015 with any questions regarding the Division of Pre-College and Summer Undergraduate Programs or camps accessibility while on campus.

Course materials are made available as a benefit to students enrolled in this course. Posting materials from class or from Canvas, including recordings of class, to third-party websites without permission is a violation of intellectual property. If you would like to post materials to another website, please speak to me first. In general, I am happy to share my resources with others who could benefit from them, but it is important to clear this with me.