CHAPMAN UNIVERSITY

Fowler School of Engineering
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Fundamentals of Computing With Python

Spring 2020

Overview

The purpose of this course is to provide a condensed, five-week introduction to computing and computer programming with Python, which will serve as a primer for high school seniors intending to enroll in an engineering program in the fall, or who think some exposure to programming would be beneficial for their university studies. Through a combination of online lectures and lab exercises, students will learn the key hardware and software concepts that drive our current models of computing. For students who have not previously been exposed to computer programming, this course will provide a foundation for further study. For students who have practical experience in programming (AP Computer Science, for example) this course will provide an opportunity to learn the Python programming language while interacting with a university professor.

Cost

None

Prerequisites

None

Workload

Approximately 3 hours per week (2 hours online lecture and office hours, 1 hour independent reading and programming with zyBooks).

Time and Place

Live lectures will take place on Wednesdays from 4pm-6pm Pacific and broadcast online so students can interact with the instructors in real-time. The first 90 minutes will be dedicated toward course material. The remaining 30 minutes will serve as office hours for students to ask questions either specifically about the course content, or generally about studying engineering at the university level and the career paths available afterward. During this time we will be joined by industry guests from companies such as Google, Microsoft, and Boeing who will share their experiences as well.

Textbook

We will be using an interactice textbook from zyBooks, which thanks to their generosity, has been made freely available to students in this course. This textbook has self-contained programming exercises that will be used to reinforce course concepts.

Instructors

Dr. Erik Linstead (linstead@chapman.edu), Dr. Elizabeth Stevens (estevens@chapman.edu)

Dr. Linstead is the Associate Dean of Academic Programs and Faculty Development in the Fowler School of Engineering, where he holds an appointment as an Associate Professor. Dr. Linstead has been teaching at Chapman approximately 17 years. His research is in the broad areas of machine learning and artificial intelligence. Outside of academia, he spent 12 years at Boeing as an embedded software engineer, and is currently a consulting senior engineering specialist at the Aerospace Corporation where he provides subject matter expertise in deep learning and computer vision.

Dr. Stevens is the Director of Engineering Faculty for the Fowler School of Engineering, where she holds an appointment as an Assistant Professor. She is also the course coordinator for the introductory programming sequence required of all majors in the School of Engineering. Dr. Stevens has been teaching at Chapman for approximately 5 years. Her research is in data science, with applications to psychology. Prior to joining the Chapman faculty she worked for Standard and Poors as a senior research assistant.

Grading and Attendance

Attendance will not be taken, grades will not be issued, course credit will not be earned. Instead the purpose of the course is to provide a no-pressure opportunity to learn something new.

Course Outline

Week 1 (April 15, 2020)

Introductions, the Von Neumann architecture, binary, Boolean logic, hardware fundamentals, compiled vs interpreted programming languages, introduction to Python

Week 2 (April 22, 2020)

Variable declaration and assignment, standard input and output, Strings, conditionals

Week 3 (April 29, 2020)

Repetion and control flow, functions

Week 4 (May 6, 2020)

Data structures (lists, tuples, dictionaries), sorting, fundamentals of algorithm analysis

Week 5 (May 13, 2020)

From programming to software engineering, the software development lifecycle, Agile software development, advanced topics

Contacting the Instructors

The instructors can be reached at "computerscience@chapman.edu". Please start the subject line of your email with "FCP" so the instructor knows it pertains to the Fundamentals of Computing with Python course.