

IS 505 Python for Business Analytics

Fall 2017

Course Description

This course introduces Python as a language and tool for collecting, preprocessing, and visualizing data for business analytics. Long a favorite language among data scientists and business analysts, Python is an essential skill with applications in business modeling, optimization, statistical analysis, deep learning, and big data analytics. Starting with a review of the fundamental programming concepts, the course builds mastery of Python language, libraries, and tools through short lectures and online tutorials. The course concludes with a final project designed to demonstrate mastery of the subject.

Learning Objectives

Theory

- To introduce fundamentals of logical reasoning as used in contemporary programming languages
- To survey basic and advanced data structures needed to organize, store, and integrate data
- To master syntax, control structures, data types, etc. in the Python programming language
- To introduce Python as a tool for data science

Practice

- To write Python scripts of intermediate length and complexity
- To design and use custom data structures using built-in and third-party data types
- To introduce and use popular third-party Python libraries like NumPy, Pandas, Matplotlib, etc.
- To master a professional-level data science software toolkit with Anaconda, Jupyter, GitHub, etc.

Instructor

Christopher L. Huntley
Dolan School of Business, Room 1122
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Office Hours

- Tuesdays 11am-noon & 5:00-6:15pm
- Fridays 2:00-3:30pm
- Other times are by appointment only. However, email works well, especially when the instructor is otherwise unavailable.

Resources

- **Textbook:** Downey, Allen. Think Python: How to Think Like a Computer Scientist (Second Edition). O'Reilly Media Inc., 2015. We will be using the [free interactive edition](#) from Runestone Academy.
- **Online Tutorials:** [Data Camps's Online Python Courses](#)
- **Software:** Anaconda (Python, Spyder, Jupyter, etc.) and GitHub Desktop (source code management and collaboration)
- **Reference Docs:** The official [Python 3 Documentation](#) covers the Python language and all built-in libraries. When in doubt, [RTFM](#).
- **Hardware:** Each student is expected to bring to class a recent-vintage laptop to class. The student must have admin rights to install software, manage ports, and set file permissions. The laptop should have at least 5GB of free space. In addition, they are expected to bring headphones / earbuds for doing online tutorials in class.
- **Websites:**
 - Class documents (including this syllabus) are [Dr. Huntley's is505-docs GitHub repository](#). For printable
 - Programing assignments are posted and managed in [GitHub Classroom](#).
 - Blackboard will be used for weekly agendas and quizzes.

Student Expectations

This is a graduate class intended for serious professionals:

- Expect to spend at least 12 hours per week attending class and completing your assignments.

- Do your own work. There is no professional benefit to pretending that somebody else's work is your own. We will follow the university's academic honesty policy to the letter.
- Be a good teammate and class citizen. Free-riding and other unprofessional behavior will result in immediate consequences, which may include failing the course.

If you cannot abide by these policies then please take another course.

Assignments and Course Grade

Quizzes (50% of Course Grade)

There will be five quizzes, with the lowest grade dropped from your quiz average. They will be given on the days shown in the attached schedule of classes. Quizzes are closed book and closed notes. They are designed to last about 25 minutes, though students will be permitted to work on them up to 40 minutes. The remainder of the class time will be devoted to new material. Please notify the instructor if you require extra time or support services.

Final Project (40% of Course Grade)

The final project is meant to a demonstration that the course objectives have been met. Teams will work in teams of 2-3 to complete a project of intermediate complexity and scope. Project details and requirements will be distributed in the fifth week of class.

Professionalism (10% of Course Grade)

Given the large class enrollment and the technical nature of the subject, it is critical that everyone take a professional approach to learning the material. Students are expected to come to class prepared and then participate in all activities to the best of their abilities. Cheating, free-riding, and other unprofessional behavior will not be tolerated.

Schedule

- Dates and assignments are subject to change, usually with one week's notice.
 - **Classwork** is to be completed before leaving class.
 - **Homework** is to be completed before the next class.
 - Saturday classes are shown in **bold**.
 - **RSI** refers to [Runestone Academy's version](#) of the *How to Think Like a Computer Scientist* book.
 - **DC** refers to [Data Camp's Data Analyst Courses](#).
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Date	Topics	Classwork	Homework	
9/5	Course Intro & Preliminaries Python Fundamentals	Software Setup RSI 1,2	RSI 3,4,10 DC "Python Basics," "Python Lists" <i>Study for Quiz 1</i>	
9/9	Programming Logic & Data Types Jupyter Notebooks	Quiz 1: Foundations RSI 5-9 Health Stats Part 1	DC "Functions and Packages" <i>Study for Quiz 2</i>	
9/12	Data Structures	Quiz 2: Jupyter and GitHub RSI 11,12 Health Stats Part 2	DC "NumPy" <i>Study for Quiz 3</i>	
9/19	NumPy	Quiz 3: Logic & Data Structures Health Stats Part 3	DC "Matplotlib", "Dictionaries & Pandas" <i>Study for Quiz 3</i>	
9/23	Pandas	Quiz 4: Numpy Health Stats Part 4 DC "Logic, Control Flow and Filtering," "Loops"	DC "Case Study: Hacker Statistics" <i>Study for Quiz 5</i>	
9/26	Data APIs	Quiz 5: Pandas Health Stats Part 5	DC "Python Data Science Toolbox (Part 1)"	
10/3	Bulletproofing Jupyter with Custom Modules (and other tips)	RSI 15 Health Stats Part 6		
10/7	Project Kickoff	Form teams and start work on the Final Project		
10/10	<i>No class, extended Fall Break</i>		Commit Final Project Notebooks to GitHub	

Date	Topics	Classwork	Homework	
10/17	Team Project Presentations: 10-minutes per team	Peer reviews for each presentation		