

Introduction to Data

Contact Information

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Course Description

Data is everywhere. That means more companies are tracking data, analyzing data, and using the insights they find to make better decisions. In this class, you'll learn the fundamentals of data analysis while building Python skills. From finance to journalism, data is the key to making compelling arguments and telling great stories. Learn how to create powerful data visualizations with Python, the fastest-growing programming language in the world.

Use your Python skills to better present the data by visualizing it with graphs, charts, and more. No more lag time—learn enough Python to quickly and efficiently process huge data sets. Learn the theories and techniques the pros use to make compelling, visual arguments with data.

Student Learning Outcomes

PC. 1: Students will have **programming knowledge** skills that allow students to develop solutions to novel problems.

- EU 1.1 Programs can be developed for creative expression, to satisfy personal curiosity, to create new knowledge, or to solve problems (to help people, organizations, or society).
- EU 1.2 People write programs to execute algorithms.
- EU 1.3 Programming is facilitated by appropriate abstractions.
- EU 1.4 Programs are developed, maintained, and used by people for different purposes.
- EU 1.5 A variety of abstractions built on binary sequences can be used to represent all digital data.
- EU 1.6 Multiple levels of abstraction are used to write programs or create other computational artifacts.
- EU 1.7 Computing facilitates exploration and the discovery of connections in information.
- EU 1.8 There are trade-offs when representing information as digital data.

PC. 2: Students will critically **computational skills** technical documentation and code.

- EU 2.1 Programming uses mathematical and logical concepts.
- EU 2.2 Algorithms are precise sequences of instructions for processes that can be executed by a computer and are implemented using programming languages.
- EU 2.3 Algorithms can solve many, but not all, computational problems.
- EU 2.4 Models and simulations use abstraction to generate new understanding and knowledge.
- EU 2.5 People use computer programs to process information to gain insight and knowledge.

Course Requirements

There are no requirements for this course.

Student Evaluation

Work Ethics	25%
Projects	35%
Challenges	25%
Exercises	15%

3 Projects

Data Visualization Capstone Project

Begin your journey by seeing some of the amazing visualizations you can make with data. Then start learning the basics of Python. Continue to expand your Python knowledge by learning how to create and use lists. Learn the basics of making, displaying, and customizing graphs using Python. Learn how to use the Python library Pandas to store and manipulate large amounts of data. Learn how to use the Python library Seaborn to create more advanced graphs.

Competency assessed: PC.1

Ethical Behavior

This course's philosophy on academic honesty is best stated as "be reasonable." This course recognizes that interactions with classmates and others can facilitate mastery of the course's material. However, there remains a line between enlisting the help of another and submitting the work of another.

The essence of all work that you submit to the course must be your own. Collaboration on problems is not permitted (unless explicitly stated otherwise) except to the extent that you may ask classmates and others for help so long as that help does not reduce to another doing your work for you. Generally speaking, when asking for help, you may show your code or writing to others, but you may not view theirs, so long as you and they respect this policy's other constraints.

Late work

Assignments are due on the announced due date. It is your responsibility to keep up with class activities and assignments and request missing assignments due to absence. Upon returning from an excused absence, students will be given two days for each day absence to make up missed assignments. All students work at a different pace and will be graded primarily on their quality of work and productivity level during class. As long as the students are highly productive each day and producing work of high quality, they will receive excellent grades. Extensions will also be available upon request.

Food/Drink

Food and drinks are not permitted near the computer stations. There will be dedicated stations for water bottles or snacking.

Electronic Devices

Phones and other electronic devices are allowed in class if they do not become a distraction (texting, playing games, checking social media, web browsing, etc.). Students who are regularly off task or behind in their work, will have their phone privileges revoked. However, during instructional time, tests and quizzes, electronic devices are not to be used at all (unless directed to by the teacher). The CTC has a general no cellphones during instruction time policy. This means your phone should not be visible during lecture, going over examples, group work. You will get one warning to put the phone away. If we are working on individual work you are welcome to ask to use your phone, if you don't ask permission you will get a

warning. After the warning your phone will go into one of the phone jails and you can collect it at the end of the class.

Computer Use

The classroom computers and related devices are to be used for classwork only. Do not download any files or programs not related to your classwork. Do not change the Login screen background. Do not install any program without permission of the teacher. Do not run any unapproved programs (Minecraft, Call of Duty, Halo, etc.), even from a network, external drive or remote device. Do not view or download any images, videos, or sound files that are offensive, racist, promote violence or drug use, etc.

Outline

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| <ul style="list-style-type: none">- Data Visualization Capstone Project<ul style="list-style-type: none">- Introduction to Python: Begin your journey by seeing some of the amazing visualizations you can make with data. Then start learning the basics of Python.- Python for Data Analysis: Continue to expand your Python knowledge by learning how to create and use lists.- Graphing in Python: Learn the basics of making, displaying, and customizing graphs using Python.- Data Manipulation in Python: Learn how to use the Python library Pandas to store and manipulate large amounts of data.- Advanced Graphing in Python: Learn how to use the Python library Seaborn to create more advanced graphs. |
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