# CS 7310 Python for AI and Data Science Syllabus

# Instructor:

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Office Hours: By Appointment

## Course Overview

Python has become the de-facto language for artificial intelligence and data science, due primarily to the wide availability of libraries that support machine learning, data analysis and visualization. This course provides grounding in the Python programming language for students pursing study in artificial intelligence and data science. Topics include Python language fundamentals, data structures, functional programming, object-oriented programming, concurrency/multi-threading, software testing, plotting and visualization. Credit cannot be applied toward a master’s degree in computer science, software engineering, or CyberSecurity. Your grade for the class will count toward your overall GPA.

**Course Format**

This class is offered via the Lyle School of Engineering distance format. There are no in-person classes.

Lecture sessions will be made available via Canvas.

**Prerequisites:**

None, although some coding experience in any language will be helpful. If you have never programmed before, it is highly recommended that you work through the LinkedIn Learning course: Foundations of Programming Fundamentals. Login to LinkedIn Learning via the SMU portal: https://www.smu.edu/OIT/Services/linkedin

## Text:

Intro to Python for Computer Science and Data Science. Deitel and Deitel.   
Pearson Publishers. 978-0-13-540467-6

**Python Resources**

* **Anaconda Download:** [**https://www.anaconda.com/products/distribution**](https://www.anaconda.com/products/distribution)
* **PyCharm Download: Google PyCharm Download – select Professional Edition (Free for SMU students)**
* **W3 Schools Python Tutorial:** [**https://www.w3schools.com/python/**](https://www.w3schools.com/python/)
* **LinkedIn Learning: Learning Python : Joe Marini**

**Topics:**

## Python vs. Java and C++

### Variables and Data Types

### Control Structures

### Functions

### Data Structures: Lists, Tuples, Dictionaries and Sets

### Array-Oriented Programming with NumPy

### Strings and Regular Expressions

### Object-Oriented Programming

* Pandas

### Concurrency and Threads

* Testing and Debugging
* Plotting and Visualization

## Assignments/homework

* There will be several Python-based homework assignments.
* Late submissions will be marked down 5% for each day late.

## Quizzes

* Quizzes are open-book and will be based on lectures and readings. Most quizzes will be timed and some will include questions that may require hands-on coding. Late submissions will incur a 5% late penalty for each late day. You have 5 free late days total for assignments and quizzes to use in case of emergencies.

### Grading

* Quizzes 20%
* Homework Assignments 30%
* Midterm Exam 25%
* Final Exam 25%

**Grades:**

A 93-100

A- 90-93

B+ 88-90

B 80-88

B- 78-80

C+ 76-78

C 70-76

C- 60-70

D 50-60

## Plagiarism

You are expected to submit your own code and hand written commentary for all assignments. Copying code without attribution is a violation of the SMU Honor Code and will affect your grade and may impact your career long term. There is a wealth of code and commentary on the web. Do not be tempted to submit someone else's code and think that changing variable names will hide the deed. Also, do not share your code with another student. If the other student submits your code, you are also responsible for the plagiarism. Just DON'T do it!

**Downloads:**

Download the Anaconda Distribution of Python from:

<https://www.anaconda.com/distribution/>

The Anaconda distribution of Python includes most of the packages you will need for AI and Data Science

IDE:

Use your favorite IDE. However, note that Pycharm Professional is free for students:

<https://www.jetbrains.com/pycharm/download/>