MTH 3300: Algorithms, Computers, and Programming I

Spring 2019

Course Number: 39940; Section: KTRA

Instructor: Evan Fink

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Office hours: Mondays, Wednesdays 1:00-2:00, and by appointment.

Meeting Time & Location: Tuesdays & Thursdays 2:55PM - 4:35PM, VC 6-130

Recommended Text: The online textbook *How To Think Like a Computer Scientist* by Wentworth, Elkner, Downey and Meyers, available at `http://http://openbookproject.net/thinkcs/python/english3e/` is a good resource that covers many of the things we will talk about, and some that we won't. In additional, I recommend that you get a hard copy of *ANY* introductory Python book; the particular one will not be terribly important, as long as it uses Python 3 (rather than Python 2). Some suggestions, in no particular order: *Python Crash Course* by Eric Matthes; *Python Programming: An Introduction to Computer Science* by John Zelle (NOT FIRST EDITION, but 2nd or 3rd is fine); *Python Programming for the Absolute Beginner, Third Edition* by Michael Dawson; *Introduction to Programming in Python: An Interdisciplinary Approach* by Sedgewick, Wayne and Dondero. None of these books are perfect, but all of them will contain things beyond what the class notes cover, and they should help reinforce and extend your knowledge of Python.

Prerequisite: MTH 2610 or 3006 or 3010, or departmental permission. **Important note: you are not allowed to register for this course if you have previously completed CIS 3120.**

Software: In this course, you will create computer programs. To create these programs at home, you can obtain free software from `https://www.continuum.io/downloads`. Make sure you download the version for your operating system (Windows vs. Mac vs. Linux), and download the Python 3.x version (at the time of this writing, Python 3.7 is available, but a higher version is fine). Please let me know if you have any trouble installing!

This syllabus is likely to evolve as the term progresses.

Class Number	Date	Topics
1	1/29	Introduction
2	1/31	Data Types, Variables, Expressions, Assignments
3	2/5	Strings, Numbers, Input and Output
4	2/7	Errors, Python's Data Model, More Printing
	2/12	NO CLASS
5	2/14	Selection, Blocks, Logical Expressions, LAST DAY TO DROP WITHOUT A GRADE OF W
6	2/19	If-Elif-Else Chains, Nested If Statements
7	2/21	Bool Variables, Debugging
8	2/26	Lists
9	2/28	For Loops
10	3/5	Midterm 1
11	3/7	Common Loop Tasks, Simulations
12	3/12	While Loops
13	3/14	Nested Loops
14	3/19	File Objects
15	3/21	Newton's Method, Nested Lists
16	3/26	Functions
17	3/28	Midterm 2
	M 4/1	WITHDRAWAL DEADLINE
18	4/2	Modular Programming
19	4/4	Dictionaries
20	4/9	Object Oriented Programming
21	4/11	Defining Classes
22	4/16	Encapsulation, Polymorphism
23	4/18	pandas
	4/19-4/28	NO CLASS
24	4/30	matplotlib
25	5/2	Recursion
26	5/7	Searching and Sorting
27	5/9	Data Structures
28	5/14	More on Data Structures
	THURS 5/16	Final 3:30-5:30 PM (Tentative)