COP 4045/ Python Programming

Credits: 3 credits

Textbook, title, author, and year: The Practice of Computing using Python, 3rd Ed., by Punch and Enbody. ISBN-13: 9780134520513

Reference materials:

1. Textbook webpage: https://www.pearsonhighered.com/product/Punch-Practice-of-Computing-Using-Python-The-3rd-Edition/9780134379760.html
2. The Python documentation page: https://docs.python.org/3/
3. The Python tutorial: https://docs.python.org/3/tutorial/index.html
4. NumPy and SciPy documentation page: http://docs.scipy.org/doc/
5. Graphical User Interfaces with Tk: https://docs.python.org/3/library/tk.html

Specific course information

Catalog description:

This class is an introduction to the Python programming language, with applications to practical problem solving involving data manipulation and analysis. The first part of the class focuses on teaching the basics of the Python language. Topics covered are data structures (lists, arrays, dictionaries, sets, comprehensions), functions, files, and object-oriented language elements. In the second part of the course students learn to apply advanced language features and methodologies in combination with third-party libraries for scientific computation to develop real-world applications.

Prerequisites: COP 3530 Data Structures and Algorithm Analysis

Specific goals for the course:

An ability to apply engineering/computer science theory and hardware/software development fundamentals to develop and conduct appropriate experimentation, analyze and interpret data, and use computing/engineering judgment produce engineering/computing-based solutions/conclusions

Brief list of topics to be covered:

Ch 1. Beginnings
Ch 2. Control
Ch 3. Algorithms
Ch 4. Working with Strings
Ch 5. Functions
Ch 6. Files and Exceptions
Ch 7. Lists and Tuples
Ch 8. More on Functions
Ch 9. Dictionaries and Sets
Ch 11. Intro to Classes
Ch 12. More on Classes
Ch 13. Program Development with Classes
Ch 14. Files and Exceptions II
Ch 15. Recursion
Ch 16. Fun stuff with Python
Scientific Programming – NumPy