Advanced Python Course

Course Summary

This Advanced Python course is for students who already know the fundamentals of Python. This course will teach more advanced Python and computer science topics including: **Object-Oriented Programming** concepts like inheritance and encapsulation, **graphical tools** in Python that allow users to create graphical interfaces, **data mining** tools like regular expressions, and integrating HTML with Python to learn **web application concepts**.

There should be projects throughout the course to teach students **real life application of Python** topics and **coding problems** to help students master the skills they are learning in class.

After this course, students should be very comfortable with the Python programming language, and be able to use Python in multiple areas in computer science. They should be able to have a good enough grasp on Python to further study other Python libraries on their own if they chose to. They should also be able to apply Python to other fields of study.

Characteristics of Class Meetings

The classes will either be lecture or programming practice. During each lecture, there should be questions throughout the lectures to check understanding from the students. After each lecture class, there should be homework and that homework is due before next class.

Course Material

- Object-oriented programming
    - Learn why object-oriented programming is useful
    - Object-oriented programming mechanisms like inheritance and encapsulation
    - Practicing using object-oriented programming
        - Ex: Build a linked list using object-oriented programming concepts
- Be introduced to graphics in Python
    - Learn about Turtle Graphics in Python
    - Learn about the Graphics library for Python
    - Use these graphical tools to build graphical interfaces
- Learn about Data Mining using regular expressions
    - Learn what regular expressions are
    - Learn why regular expressions are useful
    - See examples of regular expressions

    - Practice using regular expressions
    - Learn about how they can be used in data mining
- Practice creating projects in Python
- Practice coding problems in Python to strengthen problem-solving skills
- Learn HTML to integrate with Python
    - Web crawling
    - Web services/networked programs