

1. Course number and name

CptS 111: Introduction to Computer Programming

2. Credits and contact hours

3 credits; 2 lecture hours, 3 laboratory hours

3. Instructor's or course coordinator's name

Shira Broschat

4. Textbook, title, author, and year

Programming in Python 3 with zyLabs, an online, interactive textbook by zyBooks.

Other supplemental materials

J.B. Schneider, S.L. Broschat, and J. Dahmen. 2013. *Algorithmic Problem Solving with Python*. PDF open-access textbook. <<https://www.eecs.wsu.edu/~schneidj/swan/>>.

Reference Videos: Videos that accompany the first 7 chapters of the reference book listed above recorded by the lead author. <<https://learn.digilentinc.com/classroom/python/>>.

5. Specific course information

- a. *Catalog description*: Elementary algorithmic problem solving, computational models, sequential, iterative and conditional operations, parameterized procedures, array and list structures and basic efficiency analysis.
- b. *Prerequisites or co-requisites*: MATH 101 with a C or better, MATH 103 with a C or better, or higher level MATH course with a C or better, or a minimum ALEKS math placement score of 45%.
- c. *Required, elective, or selected elective*: Elective.

6. Specific goals for the course

By the end of the course, students will be able to

- Decompose a problem into a series of algorithmic steps (pseudocode) (1a, 1c, 1d)
- Know the proper Python styling guidelines and follow them when writing your own code (3b)
- Understand the use of functions and know how to write them in Python (1c, 1e)
- Differentiate between the different Boolean logic operators and use Boolean logic in your programs (1d)
- Write complex conditional statements that contain one or more Boolean operations (1c, 1d)
- Identify when a loop is appropriate, when to use both while- and for-loops, and write applications that use these looping constructs (1c, 1d)
- Understand the importance of lists and dictionaries in programming and identify when it is beneficial to use either (1c, 1d)
- Be able to perform basic string processing and manipulation (1c, 1d)
- Leverage your knowledge of programming to answer complex, real-world problems (1a, 1b, 1c, 1d, 1e, 6a)

7. Brief list of topics to be covered

- Setting up and using Python
- Computers and binary representation of information
- Literals and different data types (int, float, str)
- Variables and identifiers
- Arithmetic operations and precedence
- Input and output
- Type conversion
- String formatting
- Assignment and simultaneous assignment
- Functions, parameter assignment, return values, and scope
- Keyword arguments
- Function stubs
- Lists and data structures
- Multidimensional data structures (lists of lists)
- Definite and indefinite loops
- References
- Strings and string methods
- Importing modules
- Reading from and writing to files
- Boolean variables and Boolean expressions
- Conditional statements and relational operators
- Dictionaries (hashes)