CSCI 130: PYTHON PROGRAMMING WITH APP

Proposer:

Name:	**Email:**
John Redden	johnr@cos.edu

Effective Term:

Fall 2025

Credit Status:

Credit - Degree Applicable

Subject:

CSCI - Computer Science

Course Number:

130

Discipline:

And/Or	**(**	**Discipline**	**)**
	(	Mathematics	)
Or	(	Computer Science	)
Or	(	Geography	)
Or	(	Chemistry	)
Or	(	Biological Sciences	)
Or	(	Physics/Astronomy	)
Or	(	Economics	)
Or	(	Engineering	)

Catalog Title

Python Programming with Applications

Catalog Description

This course presents an introduction to computer programming using Python. It covers the basics of implementing code as well as applications to various applications. Topics include variables, functions, conditions and iteration, input and output, classes, the software life cycle, and selected algorithms. No prior coding experience is required.

Method of Instruction:

Distance Education
Laboratory
Lecture and/or Discussion

Course Units/Hours:

Course Units Minimum:

3

Lecture Hours Minimum (week)

2

Lab Hours Minimum (week)

3

Total Contact Hours Minimum (semester)

87.5

Total Outside Hours Minimum (semester)

70

Total Student Learning Minimum Hours (semester)

157.5

Repeatability:

No

Open Entry/Exit:

No

Field Trips:

Not Required

Grade Mode:

Standard Letter

TOP Code:

070710 - * Computer Programming

SAM Code:

C - Clearly Occupational

Course Content

Methods of Assessment:

Essay quizzes or exams
Mulitple choice tests
Oral presentations
Problem solving assignments or activities
Problem solving quizzes or exams
Project
Short answer quizzes or exams
Skill demonstrations

Course Topics:

	Course Topics
1	Python - Installation - Interative mode - Modules - Notebooks
2	Variables - Creating, naming, using - Mutable vs. Immutable
3	Conditions and Iteration - If statements - Else statements - Chained conditionals - Nested conditions - For loop - While statement - Break
4	Input and Output - User input and output - Reading and writing files - Formatting Strings

5	Data types - Dictionaries - Lists - Tuples - Sets - Strings - Numpy arrays - Slicing, Insertion, and Deletion
6	Functions - Invoking functions - Scope - Arguments - Returning a value
7	Object Oriented Programming - Define and create a class - Creating class instances - Calling a method of a class
8	Libraries - Import libraries - Packages and Modules
9	Documenting - Doc strings - Pep-8
10	Debugging - Using a debugger - Errors and exceptions
11	Plots - Numpy - Matplotlib - 2D graphs - Image processing
12	Selected Algorems such as - Search algorithms - Sorting algorithms - Monte-Carlo - Euler’s Method

Course Objectives:

	Course Objectives
1	Students will be able to install python and run a python script.
2	Students will be able to write and call functions with multiple parameters, including optional parameters.
3	Students will be able to write a class, invoke an instance of the class, and call member functions of the class.
4	Students will be able to properly document their code so they and others will understand what it does.
5	Students will be able to generate plots (for example scatter or bar plots) to represent data.
6	Students will be able to select and make use of data structures (tuples, dictionaries, lists, etc.) to accomplish specific coding objectives.
7	Students will be able to implement numerical algorithms to accomplish a calculation relevant to a field of study (physics, economics, math, etc.).
8	Students will be able to write a script that reads an ascii text file, performs basic string operations, and writes the file.
9	Students will be able to debug code with the help of a debugger.
10	Students will be able to search for packages, read documentation, and utilize these packages in service of a programming objective.

Course Outcomes:

	Course Outcomes
1	Students will be able to analyze a problem and design and implement an object-oriented solution to solve the problem.
2	Students will be able to produce appropriately labeled scatter plots with multiple x-y series on the same plot.
3	Students will be able to read in a file, find and manipulate a string, then print the data back to a file.

Assignments:

Assignment Type:	Details
Homework	Students will be assigned coding homework in which they will write a python program to accomplish a specified task.
Homework	Students will complete at least one coding application project. This project will include defining a task, writing and debugging code, demonstration of performance, and proper documentation.
Writing	Students will write report(s) explaining the coding problem their code is designed to address and how it addresses the issue.
Reading	Students will be assigned reading from the textbook (or other materials) in preparation for lecture. Assignments may be weekly or for each lecture.

Textbooks or other support materials

Resource Type:	Details
Books	C. R. Severance, Python for Everybody: Exploring Data Using Python 3, 2016. This is a free, creative commons resource.
Books	Downey, Think Python 2nd ed. Green Tea Press, 2015 This is a free creative commons resource.

Equity Review:

Yes

Transferable to CSU

Yes - Proposed

Transferable to CSU Justification

This course is based on the C-ID course comp 112 (https://c-id.net/descriptors/final/show/340)

Other community colleges with this course labelled as a Python course: Monterey Peninsula, Gavilan, Bakersfield, Irvine Valley, Orange Coast, West Lost Angeles San Jose City, Cerritos, Cabrillo and others.

List of CSU potential transfer: Bakersfield (CMPS 2000), Cal Poly (CSC 123), Pomona CS 1260, CSUN COMP 108, San Jose State CS 22A
List of UC potential transfer: UCSC (CSE 20), Davis (ECS 023a), UCLA (Comp SI 30), UCSD COGS 18, UCSB CMPSC 8

A good example is UC Santa Cruz which has this course as an pre-requisite for the CS series. Here at COS, we plan on listing this course as an advisory to CSCI 001 in a similar fashion.

CSU General Education

Transferable to CSU

This course will also be proposed for UC transfer.

Yes

Other Degree Attributes

Degree Applicable
Not a Basic Skills Course

Distance Learning Addendum

CSCI 130 DLA Nov23.pdf

Banner Title:

Python Programming with App