CS 81.41A Course Outline as of Fall 2021

CATALOG INFORMATION

Dept and Nbr: CS 81.41A   Title: PYTHON PRGRAM ESSENTIAL
Full Title: Programming Essentials in Python for Networking
Last Reviewed: 9/27/2021

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	4.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	4.00	Lab Scheduled	3.00	8	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	6.00		Contact Total	105.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00   Total Student Learning Hours: 210.00

Title 5 Category: AA Degree Applicable
Grading: Grade or P/NP
Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:
Formerly:

Catalog Description:
Introduction to basic concepts of computer science and fundamental techniques for solving problems using the Python programming language. This introductory programming course is suitable for both liberal arts and sciences students to further the development of critical thinking and logical reasoning through problem solving with computer programming. Students will learn to craft scripting tools, using Python programming techniques, needed for system administration, web application auditing, cybersecurity, and penetration testing. The course will help students prepare for the Python Institute's Certified Entry-Level Python Programmer Certification (PCEP) and Certified Associate in Python Programming Certification (PCAP) exams.

Prerequisites/Corequisites:

Recommended Preparation:
Eligibility for ENGL 1A or equivalent

Limits on Enrollment:

Schedule of Classes Information:
Description: Introduction to basic concepts of computer science and fundamental techniques for

solving problems using the Python programming language. This introductory programming course is suitable for both liberal arts and sciences students to further the development of critical thinking and logical reasoning through problem solving with computer programming. Students will learn to craft scripting tools, using Python programming techniques, needed for system administration, web application auditing, cybersecurity, and penetration testing. The course will help students prepare for the Python Institute's Certified Entry-Level Python Programmer Certification (PCEP) and Certified Associate in Python Programming Certification (PCAP) exams. (Grade or P/NP)

Prerequisites/Corequisites:
Recommended: Eligibility for ENGL 1A or equivalent
Limits on Enrollment:
Transfer Credit: CSU;
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**		Effective:	Inactive:
CSU GE:	**Transfer Area**		Effective:	Inactive:
IGETC:	**Transfer Area**		Effective:	Inactive:
CSU Transfer:	Transferable	Effective:	Fall 2021	Inactive:
UC Transfer:		Effective:		Inactive:

CID:

Certificate/Major Applicable:
Not Certificate/Major Applicable

COURSE CONTENT

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Describe the principles of structured programming and be able to describe, design, implement, and test structured programs using currently accepted methodology.
2. Explain what an algorithm is and its importance in computer programming.

Objectives:
Students will be able to:
1. Construct correct and efficient algorithms.
2. Describe the software-development life cycle.
3. Employ the basic elements of the Python language.
4. Implement algorithms using Python flow-control constructs.
5. Write descriptive and helpful program documentation.
6. Implement algorithms using lists.
7. Create Python scripts and programs for network management.

Topics and Scope:

I.   Introduction to Python and computer programming

II.   Setting up your Python environment

III. Data types, variables, basic input-output operations, basic operators

IV. Boolean values, conditional execution, loops, lists and list processing, logical and bitwise operations

V.   Functions, tuples, dictionaries, and data processing

VI. Transmission Control Protocol/Internet Protocol (TCP/IP) networks and Python networking

VII. Modules, Packages, and Package Installer for Python (PIP)

VIII. Strings, String and List Methods, Exceptions

IX.   Object-Oriented Programming, software-development life cycle, flow-control, and program documentation

X.   Owning the network with Scapy

All topics will be covered in the lecture and lab portions of the course.

Assignment:

Reading assignments include:
1. Online research of Python programming methods
2. Approximately 30 pages per week from the curriculum

Homework problems include:
1. Weekly online discussion thread participation
2. Hands-on exercises and class performances to demonstrate proficiency with topics
3. Online quizzes (5 - 10)
4. Creation of programming assignments using the Python programming language

Other assignments include:
1. Skills demonstration examinations
2. Classroom scenario-based exercises

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

| Weekly written online discussions | | Writing
5 - 10% |

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems, assignments for Python programming	Problem solving 15 - 30%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Class performance of Python programming and skills demonstration examinations	Skill Demonstrations 20 - 30%

Exams: All forms of formal testing, other than skill performance exams.

Exams, Final Exam and skill demonstration examinations	Exams 20 - 30%

Other: Includes any assessment tools that do not logically fit into the above categories.

Attendance and participation in scenario-based exercises	Other Category 5 - 20%

Representative Textbooks and Materials:
Python for Everybody: Exploring Data in Python 3. Severance, Russell, Charles.   CreateSpace Independent Publishing Platform: 2016 (Classic)

Python Programming: The Complete Crash Course for Beginners to Mastering Python with Practical Applications to Data Analysis & Analytics, Machine Learning and Data Science Projects - 4 Books in 1. Park, Andrew. Independently published; Illustrated edition: 2020

Violent Python: A Cookbook for Hackers, Forensic Analysts, Penetration Testers, and Security Engineers. O'Connor, TJ. 1st ed. Waltham, Mass: Elsevier, 2014. (Classic)