DEPARTMENT OF COMPUTER / INFORMATION SCIENCE AND ENGINEERING

Choice Based Credit System (CBCS)

SEMESTER - VI

Python Programming (3:0:0) 3

(Effective from the academic year 2023-24)

Course Code	21CS654	CIE Marks	50
Teaching Hours/Week (L:T:P)	3:0:0	SEE Marks	50
Total Number of Contact Hours	40	Exam Hours	3 Hours

Course Objectives:

This course will enable students to:

1. Learn the syntax and semantics of Python programming language.
2. Illustrate the process of structuring the data using lists, tuples and dictionaries.
3. Demonstrate the use of functions
4. Implement the Object-Oriented Programming concepts in Python.

Module – I

Introduction: **Python Basics**, Entering Expressions into the Interactive Shell, The Integer, Floating-Point, and String Data Types, String Concatenation and Replication, Storing Values in Variables, Your First Program, Dissecting Your Program, **Flow control**, Boolean Values, Comparison Operators, Boolean Operators, Mixing Boolean and Comparison Operators, Elements of Flow Control, Program Execution, Flow Control Statements, Importing Modules, Ending a Program Early with sys.exit()

Textbook 1: Chapter 1,2 **(8 hours)**

Module – II

Introduction to functions: Functions, def Statements with Parameters, Return Values and return Statements, The None Value, Keyword Arguments and print(), Local and Global Scope, The global Statement, A Short Program: Guess the Number.

Lists: The List Data Type, Working with Lists, Augmented Assignment Operators, Methods, List-like Types: Strings and Tuples

Textbook 1: Chapter 3,4 **(8 hours)**

Module – III

Dictionaries and Structuring Data, The Dictionary Data Type, Pretty Printing, Using Data Structures to Model Real-World Things

Manipulating Strings: Working with Strings, Useful String Methods, Project: Password Locker

Textbook 1: Chapter 5,6 **(8 hours)**

Module – IV

Files and exceptions: Text files, Writing variables, Directories, Pickling, Exceptions

Debugging, Raising Exceptions, Getting the Traceback as a String, Assertions, Logging, IDLE'sDebugger

Textbook 2: Chapter 11

Textbook 1: Chapter 10 **(8 hours)**

Module – V

Classes and objects, Programmer-defined types, Attributes, Rectangles, Instances as return values, Objects are mutable, Copying, **Classes and functions,** Time, Pure functions, Modifiers, Prototyping versus planning, **Classes and methods,** Object-oriented features, Printing objects, Another example, A more complicated example,The init method, The __str__ method, Operator overloading, Type-based dispatch, Polymorphism, Interface and implementation.

TextBook 2: Chapter 12,13,14 **(8 hours)**

Course outcomes:

The students will be able to:

CO1: Understand syntax and semantics of python programming
CO2: Apply knowledge of python programming for different applications.
CO3: Develop python programs to realize various computational applications
CO4: Interpret the concepts of Object-Oriented Programming as used in Python.

Textbooks

1.	Al Sweigart,**"**Automate the Boring Stuff with Python**",**1stEdition, No Starch Press, 2015. (Available under CC-BY-NC-SA license at https://automatetheboringstuff.com/)
2.	Allen B. Downey, "Think Python: How to Think Like a Computer Scientist, 2ndEdition, Green Tea Press, 2015. (http://greenteapress.com/thinkpython2/thinkpython2.pdf) (Download pdf files from the above links)

References

1.	David Beazley, Brian K. Jones,Python Cookbook: Recipes for Mastering Python 3, 3rd Edition, Kindle Edition, O'Reilly Media; 3rd edition (10 May 2013)
2.	Charles R. Severance, Python for Everybody: Exploring Data Using Python 3, 1st Edition, CreateSpace Independent Publishing Platform, 2016. (http://do1.dr-chuck.com/pythonlearn/ENus/pythonlearn.pdf)