

- Quiz / Assignment/ Quiz/ Discussion / Seminar
- Midterm Exam
- Programming Assignments
- Final Exam

Mapping of COs to Assessment Rubrics:

| | Internal Exam | Assignment | Lab Assignments | End Semester Examination |
|-------------|---------------|------------|-----------------|--------------------------|
| CO 1 | ✓ | | | ✓ |
| CO 2 | ✓ | ✓ | | ✓ |
| CO 3 | ✓ | ✓ | | ✓ |
| CO 4 | ✓ | | ✓ | ✓ |

2. PYTHON PROGRAMMING

| | | | | | |
|----------------|--|------------------|-------------------|--------------------|------------------|
| Discipline | COMPUTER SCIENCE | | | | |
| Course Code | UK2DSCCSC101 | | | | |
| Course Title | PYTHON PROGRAMMING | | | | |
| Type of Course | DSC | | | | |
| Semester | II | | | | |
| Academic Level | 1 | | | | |
| Course Details | Credit | Lecture per week | Tutorial per week | Practical per week | Total Hours/Week |
| | 4 | 3 hours | - | 2 hours | 5 hours |
| Pre-requisites | . Basic knowledge on Computer | | | | |
| Course Summary | This course provides a comprehensive introduction to Python, covering fundamental concepts, data structures, control flow, functions, modules, and object-oriented programming thus covering essential concepts and practical applications across various domains. | | | | |

Detailed Syllabus:

| Module | Unit | Content | Hrs (L+P) |
|---------------|---|--|----------------------|
| I | Introduction to Python | | 15 |
| | 1 | Fundamentals of Computing – Identification of Computational Problems, Algorithms, Flow charts and Pseudo codes. | |
| | 2 | Introduction to Python - Features of Python, Python interpreter, Interactive and script modes | |
| | 3 | Identifiers, Reserved Keywords, Operators ,Comments in Python, Input,Output | |
| II | Mutable and Immutable Types | | 15 |
| | 4 | Data Types and Operations - int, float, complex | |
| | 5 | Strings - escape characters, string formatting functions; | |
| | 6 | List - built-in list functions & methods; | |
| | 7 | Tuple - built-in tuple functions; | |
| | 8 | Set – built-in set function & methods; | |
| | 9 | Dictionary - built-in dictionary functions & methods; | |
| | 10 | Mutable and Immutable Objects, Data Type Conversion; | |
| III | Flow Control & Functions | | 15 |
| | 11 | Flow control - Decision Making – if,if ...else, if...elif, Iteration -for, range() while, loop with else, nested loop, break, continue, pass; | |
| | 12 | List comprehension – nested list; | |
| | 13 | Functions- Definition, calling, arguments, anonymous function, recursion, return, filter(),reduce(),map() | |
| IV | Packages, Files, Exception handling & Object Oriented Concepts | | 15 |
| | 14 | Modules & Packages - Built-in Modules, Creating Modules, import statement, Locating, modules ,Namespaces and Scope-local,& global, dir (), reload (),Packages in Python; | |
| | 15 | File Handling- open, close, write, read, methods, rename, delete, directories; | |

| | | | |
|----------|--|--|-----------|
| | 16 | Exception handling- built in exceptions, Handling, Exception with arguments, Raising and User defined exceptions; | |
| | 17 | Object oriented programming- OOPs concepts , class, object, method, attribute- static & instance, encapsulation, constructor, destructor, data hiding; | |
| V | Flexi Module: Not included for End Semester Exams | | 15 |
| | 18 | Pattern Matching with Regular expression, Database Programming: Connecting to a database, Creating Tables,INSERT, UPDATE, DELETE and READ operations | |

CORE TEXTS

1. Jeeva Jose, “Taming PYTHON By Programming”, Khanna Publications, 2017
2. Charles Dierbach, “Introduction to Computer Science using Python - A computational Problem solving Focus”, Wiley India Edition, 2015.

ADDITIONAL REFERENCES

1. Mark Lutz, “Learning Python Powerful Object Oriented Programming”, O’reilly Media 2018, 5th Edition.
2. Timothy A. Budd, “Exploring Python”, Tata MCGraw Hill Education Private Limited 2011, 1st Edition.
3. Allen Downey, Jeffrey Elkner, Chris Meyers, “How to think like a computer scientist: learning with Python”, 2012.

LAB EXERCISES

The laboratory work will consist of 20-25 experiments

Part A

1. Programs to write, test and debug simple Python programs (Operators & expressions).
2. Programs to demonstrate conditional and looping statements.
3. Programs to demonstrate strings, list, tuples and dictionaries.
4. Programs using list comprehension.
5. Programs to demonstrate the use of functions.
6. Programs to perform list sorting and searching.

Part B

7. Program to read and write data from/to files in Python.
8. Programs to demonstrate creating and handling of modules and packages.
9. Programs to demonstrate Exception Handling situations.
10. Programs to demonstrate Class and Object.

Course Outcomes

| No. | Upon completion of the course the graduate will be able to | Cognitive Level | PSO addressed |
|-----|--|-----------------|---------------|
| CO1 | Use basic concepts of Python Programming | Ap | PSO-1, 2, 3 |
| CO2 | List mutable and immutable data types in Python | Ap | PSO-1, 2, 3 |
| CO3 | Illustrate flow control techniques in python programming | Ap | PSO-1, 2, 3 |
| CO4 | Make use of object oriented concepts in python programming | Ap | PSO-1, 2, 3 |

R-Remember, U-Understand, Ap-Apply, An-Analyse, E-Evaluate, C-Create

Note: 1 or 2 COs/module

Name of the Course: Credits: 3:0:1 (Lecture:Tutorial:Practical)

| CO No. | CO | PO/PSO | Cognitive Level | Knowledge Category | Lecture (L)/ Tutorial (T) | Practical (P) |
|--------|--|------------------------------|-----------------|--------------------|---------------------------|---------------|
| 1 | Use basic concepts of Python Programming | PO-1, 2, 6, 7 PSO-1, 2, 3 | Ap | F, C, P | L | P |
| 2 | List mutable and immutable data types in Python | PO-1, 2, 6, 7 PSO-1, 2, 3 | Ap | F, C, P | L | P |
| 3 | Illustrate flow control techniques in python programming | PO-1, 2, 6, 7 PSO-1, 2, 3 | Ap | F, C, P | L | P |

| | | | | | | |
|---|--|------------------------------|----|---------|---|---|
| 4 | Make use of object-oriented concepts in python programming | PO-1, 2, 6, 7 PSO-1, 2, 3 | Ap | F, C, P | L | P |
|---|--|------------------------------|----|---------|---|---|

F-Factual, C- Conceptual, P-Procedural, M-Metacognitive

Mapping of COs with PSOs and POs :

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO 1 | PSO 2 | PSO 3 | PSO4 |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|------|
| CO 1 | 1 | 1 | - | - | - | 2 | 2 | - | 3 | 2 | 2 | - |
| CO 2 | 1 | 2 | - | - | - | 2 | 2 | - | 3 | 2 | 2 | - |
| CO 3 | 3 | 2 | - | - | - | 2 | 2 | - | 3 | 3 | 2 | - |
| CO 4 | 3 | 2 | - | - | - | 2 | 2 | - | 3 | 3 | 2 | - |

Correlation Levels:

| Level | Correlation |
|-------|--------------------|
| - | Nil |
| 1 | Slightly / Low |
| 2 | Moderate / Medium |
| 3 | Substantial / High |

Assessment Rubrics:

- Quiz / Assignment/ Quiz/ Discussion / Seminar
- Midterm Exam