

**Course: Major**  
**Introduction to Python Programming**

<b>Semester: II</b>	<b>Credits: 2</b>	<b>Subject Code: BSMAJCS223121</b>	<b>Lectures: 30</b>
---------------------	-------------------	------------------------------------	---------------------

**Course Outcomes:**

At the end of this course, the learner will be able to:

- CO1-Understand the syntax and semantics of Python Programming Language
- CO2-Interpret the use of programming constructs such as lists, tuples, sets, strings in a python program.
- CO3-Outline a basic python program structure to facilitate code reuse with the help of functions.
- CO4-Illustrate the process of structuring of the data using files and dictionaries

**Unit 1: Introduction to Python Basics**

**15**

- Introduction to Python
- The Python Programming Language, History, features, Applications, Installing Python, Running Simple Python program
- Basics of Python
- Standard data types - basic, none, Boolean (true & False), numbers, Variables, Constants, Python identifiers and reserved words, Lines and indentation, multi-line statements and Comments, Input/output with print and input, functions Declaration, Operations on Data such as assignment, arithmetic, relational, logical and bitwise operations, dry run, Simple Input and output etc.
- Sequence Control – Precedence of operators, Type conversion
- Conditional Statements: if, if-else, nested if-else,
- Looping- for, while, nested loops, loop control statements (break, continue, pass)
- Functions and List
- **Python Lists:** Concept, creating and accessing elements, updating & deleting lists, traversing a List, reverse Built-in List Operators, Concatenation, Repetition, In Operator, Built-in List functions and methods.
- **Functions:** Definitions and Uses, Function Calls, Type Conversion Functions, Math Functions, Composition, Adding New Functions, Flow of Execution, Parameters and Arguments, Variables and Parameters, Stack Diagrams, Void Functions, Anonymous functions Importing with from, Return Values, Boolean Functions, More Recursion, Functional programming tools - filter(), map(), and reduce(), recursion, lambda forms.

**Unit 2: Data Processing using Python**

**15**

**Dictionaries and String Tuples and Dictionaries:** Tuples, accessing values in Tuples, Tuple Assignment, Tuples as return values, Variable-length argument tuples, and Basic tuples operations, Concatenation, Repetition, in Operator, Iteration, **Built-in tuple functions, indexing, slicing and matrices. Creating a Dictionary, Accessing Values in a dictionary, Updating Dictionary, Deleting Elements from Dictionary, Properties of Dictionary keys, Operations in Dictionary, Built-In Dictionary Functions, Built-in Dictionary Methods. Sets- Definition, transaction of set (Adding, Union, intersection), working with sets**



Board of Studies	Department	Name	Signature
Chairperson (HoD)	BSC(Comp.Sci.)	Ashwini Kulkarni	<i>[Signature]</i>

- **Strings:** declaration, manipulation, special operations, escape character, string formatting operator Raw String, Unicode, strings, Built-in String methods.
- **Modules and File Processing-Modules:** Importing module, Creating & exploring modules, Math module, Random module, Time module, Packages: Importing package, creating package, examples, **Working with files:** Creating files and Operations on files (open, close, read, write), File object attributes, file positions, Listing Files in a Directory, Testing File Types, removing files and directories, copying and renaming files, splitting pathnames, creating and moving directories

**Reference Books:**

- Charles Dierbach *Introduction to Computer Science Using Python*. Wiley Publication Learning with Python, Green Tea Press; 2002.
- E Balguruswamy, *Introduction to Problem Solving with Python*, TMH publication; 2016.
- James Payne *Beginning Python: Using Python and Python 3.1*, Wrox Publication.
- Jason Montojo Jennifer Campbell, Paul Gries, *An Introduction to Computer Science using Python*, The pragmatic bookshelf; 2013.
- John Paul Mueller, *Beginning Programming with Python for Dummies*, Paperback; 2015
- Michael H. Goldwasser, David Letscher, *Object-oriented Programming in Python*, Pearson Prentice Hall, 2008.

Board of Studies	Name	Signature	
Chairperson (HoD)	Mrs. Ashwini Kulkarni	Ashwini 25/5/23	
Faculty	Mrs. Swati Pulate		Swati 25/5/23
Faculty	Mrs. Smita Borkar	Smita 25/5/23	
Faculty	Mrs. Shubhangi Jagtap		Shubhangi 25/5/23
Faculty	Mrs. Alka Kalhapure	Alka 25/5/23	
Subject Expert (Outside SPPU)	Dr. Aniket Nagane		Aniket 25/5/23
Subject Expert (Outside SPPU)	Dr. Manisha Divate	Divate 25/5/23	
VC Nominee (SPPU)	Dr. Reena Bharathi		Reena 25/5/23
Industry Expert	Ms. Anjali Ingole	Anjali 25/5/23	
Alumni	Ms. Pooja Pande		Pooja 25-5-23



Board of Studies	Department	Name	Signature
Chairperson (HoD)	BSC(Comp.Sci.)	Ashwini Kulkarni	Ashwini 25/5/23