

S. No.	Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
								Sessional	Final Exam	Total
3	ESC-202	Introduction to programming with Python	ESC	4	3	1	0	50	100	150

### Course Outcomes:

At the end of the course the student will be able to:	
CO1	Understand the programming basics of the operations, control structures, and data types
CO2	Analyze the various data structures available in Python programming language and apply them to solve computational problems.
CO3	Apply the knowledge in writing the script using python
CO4	Comprehend class inheritance and polymorphism
CO5	Identify real-world software development challenges, and create practical and contemporary applications

### Detailed Syllabus

#### Section-A

**Unit 1:** Conceptual Introduction to Python programming, Python Interpreter, Invoking the Interpreter, The Interpreter and Its Environment, Python as a Calculator, Numbers, Strings, Lists, First Steps Towards Programming, if Statements, for Statements, The range() Function, break and continue Statements, and else Clauses on Loops, pass Statements, Defining Functions, More on Defining Functions, Intermezzo: Coding Style

(12Hrs)

**Unit 2:** Data Structures: More on Lists, The del statement, Tuples and Sequences, Sets, Dictionaries, Looping Techniques, More on Conditions, Comparing Sequences and Other Types, Modules, More on Modules, Standard Modules, The dir() Function, Packages

(8Hrs)

**Unit 3:** Input and Output: Fancier Output Formatting, Reading and Writing Files, Errors and exceptions: Syntax Errors, Exceptions, Handling Exceptions, Raising Exceptions, Exception Chaining, User-defined Exceptions, Defining Clean-up Actions, Predefined Clean-up Actions

(8 Hrs)

#### Section-B

**Unit 4:** Classes: A Word About Names and Objects, Python Scopes and Namespaces, A First Look at Classes, Random Remarks, Inheritance, Private Variables, Odds and Ends, Iterators, Generators, Generator Expressions.

(10 Hrs)

**Unit 5:** Brief Tour of the Standard Library, Simple Graphics and Image Processing: "turtle" module; simple 2d drawing - colors, shapes; digital images, image file formats.

(8Hrs)

#### Text Books

S.No	Name of the Suggested Books	Name of Author	Publisher Name	Edition (Pub. Yr.)
1	The Fundamentals of Python: First Programs.	Kenneth A. Lambert	Cengage Learning	1 <sup>st</sup> (2011)
2	Introduction to Computation and Programming Using Python	John V Guttag	Prentice Hall of India	2 <sup>nd</sup> (2016)

#### Reference Books

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Data Structures and Algorithms in Python.	Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser	Wiley	1 <sup>st</sup> (2013)
2	Core Python Programming	Wesley J. Chun	Prentice Hall	2 <sup>nd</sup> (2006)