NIRMA UNIVERSITY
INSTITUTE OF TECHNOLOGY

B.Tech.
<u>OPEN ELECTIVE</u>

L	T	P	C
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Course Code	2ECOE09
Course Title	Programming with Python

Course Outcomes (COs):
At the end of the course, the students will be able to
1. Demonstrate proficiency in applying scripting elements such as variables, strings, lists, numbers, etc. and use while and if loops to test for certain conditions.
2. Develop user interactive programs.
3. Explore how to write functions to make parts of your program reusable.
4. Solve the common errors gracefully and write a few programs that solve some well-defined problems.

Syllabus: **Teaching Hours: 30 Hrs**

UNIT I: Introduction to Python   03
Setting up Programming Environment, Python on Different Operating Systems, Troubleshooting Installation Issues, Running Python Programs from a Terminal.

UNIT II: Variables and Simple Data Types   03
Variables, Strings, Numbers, Comments, the Zen of Python

UNIT III: Introducing and working with List   06
List, Changing, Adding, and Removing Elements, Organizing a List, Avoiding Index Errors When Working with Lists, Looping Through an Entire List, Avoiding Indentation Errors, Making Numerical Lists, Working with Part of a List, Tuples, Styling Your Code.

UNIT IV: If Statements and Dictionaries   04
Conditional Tests, if Statements, Using if Statements with Lists, Working with Dictionaries, Looping Through a Dictionary, Nesting.

UNIT V: User Input and While Loops   04
How the input Function Works, Introducing while Loops, Using a While Loop with Lists and Dictiona

UNIT VI: Functions and Classes   06
Defining a Function, Passing Arguments, Return Values, Passing a List, Passing an Arbitrary Number of Arguments, Storing Your Functions in Modules, Creating and Using a Class, Working with Classes and Instances, Inheritance, Importing Classes, The Python Standard Library.

UNIT VII: Files and Exception   02
Reading from a File, Writing to a File, Exceptions, Storing Data

Testing a Function, Testing a Class

Self-Study:
The self-study content will be declared at the commencement of the semester. Around 10% of the questions will be asked from self-study content.

Laboratory Work:
Laboratory work will be based on the above syllabus with minimum 10 experiments to be incorporated.

References:
1. Eric Matthes, Python Crash Course, A Hands-on, Project-based Introduction to Programming, no starch press
2. Allen B. Downey, Think Python, How to think like a Computer Scientist, O'Reilly Publication
3. John Paul Mueller, Beginning Programming with Python, John Wiley & Sons, Inc. Publication

4. Nilabh Nishchhal, Python Made Easy: Step by Step Guide to Programming and Data Analysis using Python for Beginners and Intermediate Level, Notion Press

L= Lecture, T= Tutorial, P= Practical, C= Credit