Course: 204: Python Programming Language

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<tr><td>Course Code</td><td><b>204</b></td></tr>
<tr><td>Course Title</td><td><b>Python Programming Language</b></td></tr>
<tr><td>Credit</td><td>4</td></tr>
<tr><td>Teaching per Week</td><td>4 Hrs</td></tr>
<tr><td>Medium of Instruction</td><td>English</td></tr>
<tr><td>Minimum weeks per Semester</td><td>15 (Including Classwork, examination, preparation, holidays, etc.)</td></tr>
<tr><td>Effective From</td><td>June 2020</td></tr>
<tr><td>Purpose of Course</td><td>The Python language is used popularly among the people working in the area of Machine Learning (ML), Data Analytics, Artificial Intelligence, Web Application, and even the people working on Desktop Applications. This course imparts to the students understanding of Python programming language.</td></tr>
<tr><td>Course Objective</td><td>1. To make students understand Python Language
2. To make students understand various components of language and its Working
3. To prepare students to understand the use of language in the area of AI, ML, Data Analytics etc.
4. To make students understand the important</td></tr>
<tr><td>Course Outcome</td><td>CO1: Students will be able to Write, Test and Debug Python Programs.
CO2: Students will be able to Implement Conditionals and Loops, use functions and represent Compound data using Lists, Tuples and Dictionaries in Python programs.
CO3: Students will be able to Read and write data from & to files in Python and develop Real World Application.
CO4: Students will be able to Design and implement programs to solve real-world problems using Python Programming Language.
CO5: Students will learn essential packages like NumPy and Matplotlib, which are necessary for Machine Learning, Data Analytics, and AI.</td></tr>
<tr><td>Mapping between COs with PSOs</td><td>
<table>
<tr><th></th><th>PSO1</th><th>PSO2</th><th>PSO3</th><th>PSO4</th><th>PSO5</th><th>PSO6</th><th>PSO7</th><th>PSO8</th></tr>
<tr><td>CO1</td><td>▨</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>CO2</td><td></td><td></td><td></td><td>▨</td><td></td><td></td><td>▨</td><td></td></tr>
<tr><td>CO3</td><td></td><td></td><td>▨</td><td>▨</td><td></td><td>▨</td><td>▨</td><td></td></tr>
<tr><td>CO4</td><td></td><td></td><td>▨</td><td></td><td></td><td>▨</td><td>▨</td><td>▨</td></tr>
<tr><td>CO5</td><td>▨</td><td></td><td>▨</td><td>▨</td><td></td><td>▨</td><td>▨</td><td></td></tr>
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<tr><td>Pre-requisite</td><td>Basic programming skills</td></tr>
<tr><td>Course Content</td><td><b>Unit 1: Fundamentals of Python</b>
1.1 Features of Python
1.2 Python’s Integrated Development and Learning Environment (IDLE)
1.3 Python identifiers
1.4 Python Operators
1.5 Python Datatypes
1.5.1 Numeric: integer, float, complex
1.5.2 Sequence: list, tuple, range
1.5.3 Sets
1.5.4 Texts
1.5.5 Binary: bytes, bytearray
1.5.6 Iterator
1.5.7 Mapping: dictionary
1.6 Input/Output in Python

<b>Unit 2: Program Logic</b>
2.1 Control Structures
2.1.1 If, if..else, nested if, shorthand if, shorthand if..else
2.1.2 while loop
2.1.3 for loop
2.1.4 break, continue, pass
2.2 Functions in Python</td></tr>
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	2.2.1 Function declaration 2.2.2 Passing arguments to function 2.2.3 Return values 2.2.4 Variable scope and name space 2.2.5 Lambda function 2.2.6 Recursive function 2.2.7 In-built function
	Unit 3: Files and Modules 3.1 File handling 3.1.1 Reading and writing to a file 3.1.2 Creation of new file 3.1.3 Deletion of a file 3.2 Python Modules 3.2.1 Creation of module 3.2.2 Importing a module 3.2.3 Date & time module **Unit 4: Exceptions, Class and Objects** 4.1 Exception Handling 4.1.1 try, catch, finally 4.2.2 Multiple error handling: except 4.2.3 Throwing a particular error: raise 4.2 Classes and Objects 4.2.1 Creation of class and object 4.2.2 The __init__() function 4.2.3 Self parameter 4.2.4 Modifying the property of a class 4.2.5 Inheritance & Encapsulation **Unit 5: Python Packages** 5.1 NumPy 5.1.1 Installing numpy 5.1.2 Numpy Array: dtype, shape, reshape, ndim, itemsize, empty, zeros, ones, fromiter, arrange, linespace 5.1.3 Indexing and slicing, broadcasting 5.1.4 Array manipulation: changing shapes, transpose, changing dimension, joining and splitting arrays, adding and removing elements 5.1.5 Mathematical functions and matrix library 5.2 Introduction to Matplotlib 5.2.1 Installing Matplotlib 5.2.2 Components of a plot 5.2.3 Drawing a plot 5.2.4 Drawing scatter diagram
Reference Books	1. Python Programming, Anurag Gupta, G Biswas,, Mc Graw Hill 2. Exploring Python, Timothy A. Budd, McGraw Hill Publication 3. Core Python Programming, R. Nageswara Rao, Dreamtech Press 4. Learning Python, 5th Edition, Mark Lutz, O'Reilly Media 5. Python Projects, Laura Cassell, Alan Gauld, Wrox Publication 6. NumPy: Beginner's Guide, 3rd Edition, Ivan Idris, Packt Publishing 7. NumPy Essentials, Leo Chin, Tanmay Dutta, Packt Publishing 8. Matplotlib 2.x By Example, Allen Yu, Claire Chung, Aldrin Yim, Packt Publishing
Teaching Methodology	Class work, Discussion, Self-Study, Seminars and/or Assignment
Evaluation Method	30% Internal assessment based on class attendance, participation, class test, quiz, assignment, seminar, internal examination, etc. & 70% External based on semester end University examination