



**Kadi Sarva Vishwavidyalaya**  
**Faculty of Engineering & Technology**  
**Third Year Bachelor of Engineering (Information Technology)**  
(In Effect From Academic Year 2019-20)

<b>Subject Code:</b> IT506F-N	<b>Subject Title:</b> Python Programming
<b>Pre-requisite</b>	Programming Concepts

### Teaching Scheme (Credits and Hours)

Teaching scheme				Total Credit	Evaluation Scheme					
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract.	Total
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
03	00	02	05	04	03	70	30	20	30	150

### Course Objective:

- The course is designed to provide Basic knowledge of Python. Python programming is intended for software engineers, system analysts, program managers and user support personnel who wish to learn the Python programming language.  
It will be of great interest to all learners who would like to gain a thorough knowledge and understanding of the basic components of computer programming using the Python language – and might be a gentle introduction to programming for those who think they might have a longer term interest in the subject area.

### Outline Of the Course:

Sr. No	Title of the Unit	Minimum Hour
1	Introduction to Python Programming Language	5
2	Data Collections and Language Component	7
3	Object and Classes :	10
4	Functions and Modules	10
5	I/O and Error Handling In Python	10
6	Simple Algorithms and Data structures	6

**Total hours (Theory): 48**

**Total hours (Lab): 32**

**Total hours: 80**



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### Detailed Syllabus

Sr. No	Topic	Lecture Hours	Weight age (%)
1	<b>Introduction to Python Programming Language. :</b> Introduction to Python Language, <ul style="list-style-type: none"><li>• Strengths and Weaknesses,</li><li>• IDLE, Dynamic Types,</li><li>• Naming Conventions,</li><li>• String Values,</li><li>• String Operations,</li><li>• String Slices,</li><li>• String Operators,</li><li>• Numeric Data Types,</li><li>• Conversions,</li><li>• Built In Functions</li></ul>	5	10
2	<b>Data Collections and Language Component :</b> <ul style="list-style-type: none"><li>• Introduction,</li><li>• Control Flow and Syntax,</li><li>• Indenting,</li><li>• The if Statement,</li><li>• Relational Operators,</li><li>• Logical,</li><li>• Operators,</li><li>• True or False,</li><li>• Bit Wise Operators,</li><li>• The while Loop, break and continue,</li><li>• The for Loop, Lists,</li><li>• Tuples,</li><li>• Sets,</li><li>• Dictionaries,</li><li>• Sorting Dictionaries,</li><li>• Copying Collections.</li></ul>	7	15



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<b>3</b>	<b>Object and Classes :</b> <ul style="list-style-type: none"><li>• Classes in Python</li><li>• Principles of Object Orientation</li><li>• Creating Classes</li><li>• Instance Methods</li><li>• File Organization</li><li>• Special Methods</li><li>• Class Variables</li><li>• Inheritance</li><li>• Polymorphism</li><li>• Custom Exception Classes</li><li>• Type Identification</li></ul>	10	20
<b>4</b>	<b>Functions and Modules :</b> <ul style="list-style-type: none"><li>• Introduction</li><li>• Defining Your Own Functions</li><li>• Parameters</li><li>• Function Documentation</li><li>• Keyword and Optional Parameters</li><li>• Passing Collections to a Function</li><li>• Variable Number of Arguments</li><li>• Scope</li><li>• Functions - "First Class Citizens"</li><li>• Passing Functions to a Function</li><li>• Mapping Functions in a Dictionary</li><li>• Lambda</li><li>• Modules</li><li>• Standard Modules – sys</li><li>• Standard Modules – math</li><li>• Standard Modules – time</li><li>• The dir Function</li></ul>	10	20



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<b>5</b>	<b>I/O and Error Handling In Python :</b> Introduction Data Streams Creating Your Own Data Streams Access Modes Writing Data to a File Reading Data From a File Additional File Methods Using Pipes as Data Streams Handling IO Exceptions Working with Directories Metadata Errors Run Time Errors The Exception Model Exception Hierarchy Handling Multiple Exceptions	10	15
<b>6</b>	<b>Simple Algorithms and Data structures:</b> Search Algorithms Sorting Algorithms Hash Tables	6	20
	<b>Total</b>	<b>48</b>	<b>100</b>

**Instructional Method and Pedagogy:**

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.
- One internal exam will be conducted as a part of internal theory evaluation.
- Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
- Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.

**Learning Outcome:**

On successful completion of this course, the student should be able to:

- To develop proficiency in creating based applications using the Python Programming Language
- Write clear and effective python code.
- Access database using python programming.
- Develop and use Web Services using python
- To be able to create GUI applications in Python



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**E-Resources:**

- [https://onlinecourses.nptel.ac.in/noc18\\_cs21/](https://onlinecourses.nptel.ac.in/noc18_cs21/) OR <https://nptel.ac.in/courses/106106145/>
- <https://nptel.ac.in/courses/106106182/> OR [https://onlinecourses.nptel.ac.in/noc18\\_cs35/](https://onlinecourses.nptel.ac.in/noc18_cs35/)
- <https://www.python.org/>
- <https://docs.python.org/3/tutorial/>

**Reference Books:**

1. Mark Lutz, "Programming Python", O'reilly Publication
2. Mike Mcgrath, "Python in Easy Steps", Mc Graw Hill Publication
3. Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser, "Data Structures and Algorithms in Python", Wiley

**List of experiments**

No	Name of Experiment
1	Case Study: In which cases python is preferable among all other programming languages
2	Write a program to implement string functions
3	Write a program to implement functions and methods of LIST
4	Flatten a nested list structure. Example: if list1 = [1, [2, 3], [4, 5, 6, ] ] then try to convert it in 1-dimensional [1, 2, 3, 4, 5, 6, 7].
5	Write a program to eliminate duplicate values from LIST
6	Write a Python program to count the number of strings where the string length is 2 or more and the first and last character are same from a given list of strings. Sample List : ['abc', 'xyz', 'aba', '1221'] Expected Result : 2
7	Write python program to check whether the given list is palindrome or not
8	Write a program to find the prime number in a specific range using filter
9	Write python program to make sum of particular range using reduce
10	Write python program to find Armstrong number in a specific range using map
11	Write a program to find multiple items of a tuple.
12	Write a Python script to print a dictionary where the keys are numbers between 1 and 15 (both included) and the values are square of keys.
13	Write a Python program to remove a key from a dictionary.
14	Write a Python program to check if all dictionaries in a list are empty or not
15	Write a python program to read the text file using read (), readlines() and readline() methods.
16	Implement the concept of class method, static method and instance method.
17	Implement the concept of class variable, instance variable and local variable
18	Implement the concept of operator overloading for any three operator.
19	Implement the concept of multiple exceptions handling (IO Error, Name error, Value error).
20	Develop programs for data structure algorithms using python – searching, sorting and hash tables.