

Department of Computer Science and Application
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Scheme and Syllabus
of
Post Graduate Certificate
in
Python Programming
(w.e.f. Academic Session 2022-23)

Program Code: PGC-005

1. About the Course

In this dynamic world where everything changes at a rapid rate, the popularity of **Python** never seems to cease. Today, **Python Certification** is one of the most sought-after skills in the entire programming domain.

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.

2. Scope

Python programming language, to be the most promising career in technologies, industry. Opportunities in the career of python are increasing tremendously in the world. Since, Python has simple codes, faster readability capacity, significant companies are in demand in python language. Python to be an excellent tool in designing progressive ideas. Candidates interested in python increases every day.

Today, companies, our lookout for a skilled python developer for their companies. Knowing python language gives a competitive advantage when compared to other words. IT companies established lakh jobs, still expecting more developers in python for their company. Python language becomes more trending since it is implemented in upcoming technologies such as artificial intelligence, machine learning.

3. Program Learning Outcome

After completion of this program the students will, be able to:

- Define the structure and components of a Python program.
- Demonstrate proficiency in handling of loops and creation of functions. Identify the methods to create and manipulate lists, tuples and dictionaries.
- Discover the commonly used operations involving regular expressions and file system.
- Determine the need for scraping websites and working with CSV, JSON and other file formats.
- Interpret the concepts of Object-Oriented Programming as used in Python.

4. Eligibility Criteria

Any graduate either studying in PG or not, working professionals from industries or any other relevant departments where knowledge of Python are needed and applicable.

5. **Fees structure:** One-time tuition fees of Rs. 5000/-.+ Misc. Fee as applicable

6. **Intake-30 Seats**

7. **Duration -6 Months** (probably from August to January)

8. Scheme of Examination

S.No.	Course Name	Marks		Credit
		MAX	MIN	
1	Python Programming	100	40	4
2	Python Programming Lab	100	40	2
	Total	200	80	6

Note: Minimum Pass marks 40%



9. Course syllabus

Module-I

Introduction to Python: installing Python; basic syntax, interactive shell, editing, saving, and running a script. Concept of data types, variables, assignments, immutable variables, numerical types.

Module-II

Operators: Arithmetic operator, Relational Operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator and expressions. Comments in the program, understanding error messages.

Module-III

Creating Python Programs: Input and Output Statements, Control statements: Branching, Looping, Conditional Statement, Exit function, Difference between break, continue and pass.

Module-IV

Function: Defining a function, calling a function, Types of functions, Function Arguments, Anonymous functions, Global and local variables.

Module-V

String manipulations: subscript operator, indexing, slicing a string; strings and number system: converting strings to numbers and vice versa. Binary, octal, hexadecimal numbers.

Module-VI

Text files: Manipulating files and directories, os and sys modules, text files, reading/writing text and numbers from/to a file, creating and reading a formatted file (csv or tab-separated).

Module -VII

Lists, tuples, and dictionaries: basic list operators, replacing, inserting, removing an element; searching and sorting lists; Accessing tuples, Operations, working, Functions and Methods, dictionary literals, adding and removing keys, accessing and replacing values, traversing dictionaries.

Module -VIII

Modules: Importing module, Math module, Random module, Packages, Composition.

Exception Handling: Exception, Exception Handling, except clause, Try? Finally, clause, User Defined Exceptions

Module-IX

NumPy : Introduction to NumPy, Boolean Indexing with NumPy: Reading csv files, Boolean arrays, Boolean indexing with arrays

Pandas: Introduction to Pandas, exploring data with pandas: creating a series, series data describe method, DataFrame.

Module-X



Machine learning: Introduction to Machine Learning, Classification algorithms: K-Nearest Neighbour, Decision Trees, Logistic Regression, and Support Vector Machines. Model building and Model evaluation. Performance measures.

TEXT/ REFERENCE BOOKS

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011
2. Allen Downey, Jeffrey Elkner, Chris Meyers, "Think Python: How to think like a computer scientist: Learning with Pyth" 2nd Ed. 2012, O'Reilly Publishers
3. Luca Massaron John Paul Mueller, Python for Data Science For Dummies, Wiley, 2ed, 2019
4. Charles Severance " Python for everybody: Exploring data in python 3" .2017 Shroff Publisher.

WEB RESOURCES

1. <https://runestone.academy/runestone/books/published/pythonds/index.html>
2. <http://www.ibiblio.org/g2swap/byteofpython/read/>
3. https://onlinecourses.swayam2.ac.in/aic20_sp44/preview
4. https://onlinecourses.nptel.ac.in/noc21_cs67/preview
5. https://onlinecourses.nptel.ac.in/noc21_cs32/preview



Handwritten signatures and marks in blue ink, including a stylized signature, a signature that appears to be 'Dive', a signature that appears to be 'John Paul Mueller', and a signature that appears to be 'Arun'.