ITA6017	Python Programming	L	T	P	J	C
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Pre-requisite	Nil	Syllabus version				
		v.1.0				

Course Objectives:

1. To design and apply programming constructs in Python
2. To learn how to write loops and decision statements in Python.
3. To learn how to use lists, tuples, and dictionaries in Python programs
4. To apply embedded programming features in Python

Expected Course Outcomes:

1. Apply a solution clearly and accurately in a program using Python
2. Implement a given algorithm as a computer program using Python constructs
3. Demonstrate the implications of specialized data structures in Python
4. Develop simple embedded oriented applications in Python
5. Develop data visualization trends in Python

Student Learning Outcomes (SLO)	2,14,17

Module:1	Introduction to Python	4 hours

History of Python, Unique features of Python, Demo on IDE, Ipython, Spyder etc., "Hello world" program in Python, Keywords, Identifiers, Reading input from user-Demo, Python Data Types, Declaring and using Numeric data types: int, float, complex and string

Module:2	Python Operators, Expressions and Flow controls:	4 hours

All Operations and simple expressions, Conditional blocks using if, else and elif, Simple for loops in python, For loop using ranges, Use of while and do while-loop in python, Loop manipulation using pass, continue, break and else.

Module:3	Pythons List, Tuples, Dictionaries & Sets:	4 hours

Lists and its operations, Ranges: Iterators and its purpose, Tuples: Operation and usage, Python Dictionaries, examples on Dictionaries, Sets and its operations,

Module:4	Python Strings & Regular Expressions	4 hours

Strings: Understanding string in build methods and Operations[slicing], Regular Expressions: Powerful pattern matching and searching, Power of pattern searching using regex in python, Real time parsing of networking or system data using regex, Password, email, url validation using regular expression, Pattern finding programs using regular expression

Module:5	Python Functions, Exceptions and Packages	4 hours

Python user defined functions, Python packages functions, Defining and calling Function, powerful Lamda function in python, organizing python codes using functions, Programming using Exception handling, pandas, NumPy, Scikit, nltk etc.

Module:6	Data Visualization using Python	4 hours

An introduction into using database interfaces in Python for SQL, MySQL and SQLite, Principles of Information Visualization, Basic Charting, Charting Fundamentals, Applied Visualizations

Module:7	**Embedded Python**	**4 hours**
Embedded product development life cycle, Learning embedded test environment, tools and protocols. Different Types and phases of embedded testing. Linux command line interface.		
Module:8	**Contemporary issues:** Applications of Python in industry/case studies	**2 hours**
	Total Lecture hours:	**30 hours**

Text Book(s)

1. Martin C. Brown, Python: The Complete Reference, 20 Mar 2018, 4th Edition, McGraw Hill Education, USA.

Reference Books

1. R. NageswaraRao, Core Python Programming, 2018, 2nd Edition, Dreamtech Press, India.
2. Zed Shaw, Learn Python the Hard Way: A Very Simple Introduction to the Terrifyingly Beautiful World of Computers and Code, 1st October 2013, 3rd Edition, Addison Wesley, USA.
3. Paul Barry, Head First Python: A Brain-Friendly Guide, December 2016, 2nd Edition, Shroff/O'Reilly, India.

Mode of Evaluation: Assignment, CAT1, CAT2 and FAT

List of Challenging Experiments (Indicative)		
1.	Python Operators, Expressions and Flow controls	6 hours
2.	Python Strings & Regular Expressions	6 hours
3.	Pythons List, Tuples, Dictionaries & Sets:	6 hours
4.	Python Functions, Modules And Packages	6 hours
5.	Data visualization using python	6 hours
	Total Laboratory Hours	30 hours

Mode of evaluation: CAT1, CAT2 and FAT

Recommended by Board of Studies	02.03.2019		
Approved by Academic Council	No. 54	Date	14.03.2019