

Uka Tarsadia University

C. G. Patel Institute of Technology



B. Tech.

Semester – 6

(030090608/ 030080608)

PROGRAMMING WITH PYTHON

EFFECTIVE FROM July-2017

Syllabus version: 1.02

SEMESTER – 6

Programming with python (030090608/ 030080608)

Credits: 4 (Theory)

Contact hours per week: 4 (Theory)

Objective:

- To introduce students to python programming fundamentals.
- To demonstrate the principles of object oriented programming, interplay the algorithms and data structures in well-written modular code.
- To develop the skills to apply fundamentals problem solving techniques.
- To explore python programming concepts for understanding advanced concepts like regular expression, client-server networking, web services and GUI programming.
- To acquaint the students with programming skills for application development.

Outcome:

Upon completion of the course, the student shall be able to

CO1	Understand pros and cons of python vs. classical programming languages.
CO2	Understand basic syntax and functional approach in python
CO3	Understand object-oriented programming and data structures in python.
CO4	To solve problems requiring writing of well-documented programming, including use of logical constructs of python language.
CO5	To understand advanced concepts like regular expressions, client-server networking, web services and GUI programming.
CO6	To acquire significant experience with python program development environment.

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B. Tech.	Subject	Hours
Sem 6	030090608/ 030080608 Programming with Python	4 hrs/week
	(Theory)	4 Credits
Sr. No.	Topic	Hours
Unit – I		
1	Introduction: History, Features, Variables, Statements, Expressions, Operators and operands, String operations, Comments, Conditional execution, Lists, Tuples, Dictionaries, Iterations.	9
Unit – II		
2	Functions: Function calls, Built-in functions, Type conversion functions, Math functions, Adding new functions, Definitions and uses, Flow of execution, Parameters and arguments.	3
3	Strings and Regular expressions: Traversal through string with loop, String slices, Looping and counting, String comparison, String methods, Parsing strings, Character matching in regular expressions, Extracting data using regular expressions, Combining searching and extracting, Escape character.	5
4	OOPs concepts: Class and object, Class attributes, Inheritance, Overloading, Overriding, Data hiding, Multithreading.	4
Unit – III		
5	Files and Text I/O: Opening files, Reading files, Writing files, Text files and lines, Searching through a file, Other operations, Getpass module, Readline module, Curses package.	3
6	Modules: Importing module, Math module, Random module, Packages, Composition.	3
7	Exception handling: Exception, Exception handling, <i>except</i> clause, <i>try</i> clause, <i>finally</i> clause, User defined exceptions.	3
Unit – IV		
8	GUI programming: Introduction to Tkinter, Commonly used simple widgets: button, checkbutton, entry, label, listbox, radiobutton, scale, scrollbar; Container widget, Menus, Text widget, Canvas widget, Layout management.	9

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9	Events: Keyboard events, Mouse events, Event-related methods.	3
Unit – V		
10	Working with databases: Database concepts, Creating a database table, Basic data modelling, Programming with multiple tables, Three kinds of keys, Using JOIN to retrieve data.	5
11	Networking: Socket, Socket module, Methods, Client and server, Internet modules.	4
Unit – VI		
12	Using web services: eXtensible Markup Language - XML, Parsing XML, Looping through nodes, JavaScript Object Notation - JSON, Parsing JSON, Application Programming Interfaces, Google geocoding web service, Security and API usage, Sending emails, Networked programs.	9

Practical
(030090608/ 030080608)
Programming with Python

Credit: 1 (Practical)

Contact hours per week: 2 (Practical)

Sr. No.	Programming with Python (Practical)	Hours
1	a. Write a python program to check whether a given number is Armstrong or Palindrome. b. Write a python program to test whether a passed letter is a vowel or not. c. Write a python program to check if a number is a perfect square.	2
2	a. Write a python program to filter the positive numbers from a list. b. Write a python program to get the maximum and minimum value in a dictionary.	2
3	a. Write a python program to remove duplicates from tuple. b. Create classes Area, Triangle and Square. Area class contains a method area_cal() to calculate area of particular shape. print_area() method is used to print calculated area. Use method overriding concept.	2
4	a. Write a python program to implement function overloading. b. Write a python program to implement single inheritance.	2
5	a. Write a python program to insert/delete a linked list node at/from a given position. b. Implement queue using list in python.	4
6	a. Write a python program to find sequences of one upper case letter followed by lower case letters. b. Write a python program to find the substrings within a string. c. Write a python program to remove leading zeros from an IP address.	4
7	Write a menu driven program to: i. Print total number of sub-directory in current directory. ii. Print total number of files available in sub-directory of given path. iii. Print current given directory name. iv. Remove .txt files from given path.	2
8	a. Write a python program to sort files by date. b. Write a python program to check whether a file exists or not.	2
9	Create a window which contains an entry box and a button. On click of button, contents of entry box shall be written into one text file.	2

10	Using Tkinter, write a menu driven program to insert, update, and delete data of students with the help of SQLite3 database table and generate mark sheet of particular student in appropriate format.	4
11	Write a python program to create client-server application using socket programming.	2
12	Write a program that reads JSON data from a web server running PHP and MySQL.	2

Text book:

1. Martelli, A. - "Python in a nutshell", O Reilly.

Reference books:

1. Charles R. Severance – "Python for Informatics: Exploring Information", CreateSpace Independent Publishing Platform.
2. Mark Lutz - "Learning Python", O Reilly.
3. Grayson, J. - "Python and Tkinter Programming", Manning publication.

Course objectives and Course outcomes mapping:

- To introduce students to python programming fundamentals. CO1, CO2, CO3, CO4, CO5, CO6
- To demonstrate the principles of object oriented programming, interplay the algorithms and data structures in well-written modular code. CO2, CO3
- To develop the skills to apply fundamentals problem solving techniques. CO3
- To explore python programming concepts for understanding advanced concepts like regular expression, client-server networking, web services and GUI programming. CO4
- To acquaint the students with programming skills for application development. CO5, CO6

Course units and Course outcome mapping:

	CO1	CO2	CO3	CO4	CO5	CO6
Introduction to python	√	√				
Functions, Strings and Regular expressions, OOPs concepts		√	√		√	
Files, Text I/O, Modules and Exception handling						√
GUI programming and Events					√	√
Working with databases and Networking					√	√
Using web services					√	√

Programme Outcomes:

- **PO 1: Engineering knowledge:** An ability to apply knowledge of mathematics, science, and engineering.
- **PO 2: Problem analysis:** An ability to identify, formulates, and solves engineering problems.
- **PO 3: Design/development of solutions:** An ability to design a system, component, or process to meet desired needs within realistic constraints.
- **PO 4: Conduct investigations of complex problems:** An ability to use the techniques, skills, and modern engineering tools necessary for solving engineering problems.
- **PO 5: Modern tool usage:** The broad education and understanding of new engineering techniques necessary to solve engineering problems.
- **PO 6: The engineer and society:** Achieve professional success with an understanding and appreciation of ethical behaviour, social responsibility, and diversity, both as individuals and in team environments.
- **PO 7: Environment and sustainability:** Articulate a comprehensive world view that integrates diverse approaches to sustainability.
- **PO 8: Ethics:** Identify and demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships, and field work.
- **PO 9: Individual and team work:** An ability to function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- **PO 10: Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give/receive clear instructions.
- **PO 11: Project management and finance:** An ability to demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- **PO 12: Life-long learning:** A recognition of the need for, and an ability to engage in life-long learning.

Programme Outcomes and Course Outcomes mapping:

Programme Out come	Course outcomes					
	CO1	CO2	CO3	CO4	CO5	CO6
PO1	√	√	√	√	√	√
PO2		√	√			
PO3	√	√	√	√	√	√
PO4	√	√	√	√	√	√
PO5	√	√	√	√	√	√
PO6		√	√	√	√	√
PO7	√	√	√	√	√	√

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PO8	√	√	√	√	√	√
PO9	√	√	√	√	√	√
PO10		√	√	√	√	
PO11	√	√	√	√	√	√
PO12	√	√	√	√	√	√

