FACULTY OF COMPUTER APPLICATIONS
Bachelor of Science (Information Technology)
B.Sc. (IT)

- **Sem.** :4
- **Subject Code** :05BS0402
- **Subject** : Programming Techniques-4(Python)
- **Course Objectives** :
    1. To be familiarized with the basics of Python Programming
    2. To understand Functions and modules in python
    3. To implement the concepts of Exception Handling and File Handling in Python
    4. To learn the concepts of Object-Oriented Programming in Python
    5. To be able to understand the basics of Django

- **Prerequisites** :OOP concepts, Basic understanding of any Programming Language

Unit No	Topics Covered	No of lectures required
1	**Basics of Python:** • Features of Python • Installing Python • What is IDLE and its basics • Python Built-in Data Types (Numbers, Lists, Tuples, Strings, Dictionaries, Sets, File Objects, etc.) • Indentation and Block Structuring • Comments • Variables and assignments • Getting input from user • Built-in Operators • Control Flow (if-else-if, while, for loop, statement blocks, writing simple programs	18

	using all above) • List, Tuples, Dictionary, Strings in Python	
2	**Functions& Modules:** • Function basics, positional parameters, passing arguments by parameter name, variable length arguments • Local, nonlocal and global variables • Assigning functions to variables • Lambda expressions / Lambda Functions • Basics of modules • Import statement (different ways of importing module) • Library and third-party modules • Rules related to Scope in python and namespaces	**08**
3	**Exception & Files:** • Introduction to Files • Type of Files • Path and path names, absolute and relative path • Manipulating path names • Useful constants and functions • Getting file information • Processing all files • Opening file and file objects, Closing files • Reading & writing files • Working with Text Files • Working with Binary Files • Introduction to exceptions • Types of exceptions • Catching & handling exceptions • Defining new exceptions • Exception inheritance hierarchy	**12**
4	**Classes and Object-oriented Programming:** • Basics of Object-Oriented Programming with features • Defining class • Instance variables, methods • Class variables, methods • Static methods and class methods • Private variables and methods • Inheritance • Scoping rules and namespaces for class	**06**

	instances • Destructors and memory management • Multiple inheritance • Operator overloading basics, overloading various operators in Python	
5	**Introduction to DJango:** • DJango Overview • Advantages of DJango • Installing DJango • DJango Architecture • Creating and setting up basic Application • Creating Simple View	**06**

Course Outcomes: (After completion of this course student should be able to)

1. Describe basics of Python Programming
2. Design a Python Program using Functions & Modules
3. Develop understanding of Exceptions and File Handling in Python
4. Build their ability to develop Python Programs using Object-Oriented concepts
5. Ability to understand the basics of Django

Course Outcomes – Program Outcomes Mapping Table :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1								
CO2								
CO3								
CO4								
CO5								

Text Book:

1. **Core Python Programming, Wesley J. Chun, Prentice Hall. Second Edition**

2. **R Nageswara Rao, Core Python Programming, Dreamtech Press, Second Edition**

Reference Books:

1. **Python Programming for Absolute Beginners, Michael Dawson, Premier Press, First Edition**
2. **Head First Python, Paul Berry, O'REILLY , First Edition**
3. **The Quick Python Book, Vernon L. Ceder, Manning, First Edition**

Web References:

1. **https://docs.python.org/3/tutorial/**
2. **https://www.tutorialspoint.com/python/index.htm**

App References:

1. **Learn Python Programming Tutorial**
2. **Learn Python**

Syllabus Coverage from text book:

Unit #	Text Book #	Chapter Numbers
1	1	1,2,3,4,5,6,7,8
2	1	9,10
3	1	12,13,14
4	1	15
5	--	Online reference

Marwadi University

FACULTY OF COMPUTER APPLICATIONS
Bachelor of Science (Information Technology)
B.Sc. (IT)
PRACTICALS

Sr. No	List of Practicals
1.	Write a simple Python Program to INPUT two variables and print Addition, Subtraction, Multiplication and Division of both numbers.
2.	Write a program to input 2 number and an arithmetic operator. Display the result accordingly.
3.	Write a program to input Principal Amount, Rate and Year and display Simple Interest.
4.	Write a program to input Principal Amount, Rate and Year and display Compound Interest
5.	Write a program to input radius of a circle, and print area of that circle.
6.	Write a program to input a number and print whether it is Even or Odd Number.
7.	Write a program to input age of person and display message as follows - If age < 12 print You are Kid - If age between 12 to 17 print You are teenager - If age between 18 to 60 print you are Adult If age > 60 print You are Senior Citizen
8.	Write a Python Program to input marks of 4 subjects and display Total, Percentage, Result and Grade. If student is fail (<40) in any subject then Result should be displayed as “FAIL” and Grade should be displayed as “With Held**”
9.	Write a program to input a number and display Table of that number.
10.	Write a program to print all numbers which are divisible by 7 between 1 to 200.
11	Write a program to input a number and display Factorial of that number. For example, Factorial of 5 = 5 * 4 * 3 * 2 * 1 = 120.
12	Write a program to input a number and display whether number is prime or not.
13	Write a program which will find all such numbers which are divisible by 7 but are not a multiple of 5, between 2000 and 3200 (both included).

FACULTY OF COMPUTER APPLICATIONS
Bachelor of Science (Information Technology)
B.Sc. (IT)

14	Write a program to print all prime numbers between 1 to 100.
15	Write a program to print factorial number using function
16	Write a program to create list in such a way that it should add square roots of number between 1 to n in the list... At the end, the list shall be displayed. Example : [1, 4, 9, 16, 25, ...]
17	Write a program to create dictionary in such a way that it should add number as a key and square root of number as a value between 1 to n in the dictionary... At the end, the data shall be displayed. Example : {1:1, 2:4, 3:9, 4:16, 5:25, ...}
18	Write a program which accepts a sequence of comma-separated numbers from console and generate a list and a tuple which contains every number.
19	Write a Python Program to create a function which accepts 3 arguments. (2 numbers and one arithmetic operator). Display answer accordingly
20	Write a Python Program to create function which accepts one argument as a number and return Factorial value of the number. (Function must be RECURSIVE function, not loop)
21	Write a program to create lambda function to add two numbers and display total.
22	Write a Python Program accept comma separated string and display tokens using split(), rsplit() and splitlines()
23	Write a program that accepts a comma separated sequence of words as input and prints the words in a comma-separated sequence after sorting them alphabetically. Suppose the following input is supplied to the program :without,hello,bag,world Then, the output should be :bag,hello,without,world
24	Write a program that accepts sequence of lines as input and prints the lines after making all characters in the sentence capitalized. If you enter blank line, shall be treated as exit of program. All the upper case converted lines shall be added to list one by one
25	Write a program to generate random password which shall combine upper case alphabets, lower case alphabets, digits and special characters. You shall prepare separate dictionary items called “lower”, “upper”, “digits”, “special” and values shall be stored accordingly. From this array, based on the user’s choice random password shall be generated. You shall make sure that

	atleast one character is selected from all specified choices. Use dictionary / list as applicable
26	Write a program to read names from keyboard and store into text file
27	Write a program to read any text file line by line
28	Write a program to read text file having number and display all numbers with total and average at the last. (Manually prepare a file having some numbers and then read it)
29	Write a program to compute the frequency of the words from the input. The output should output after sorting the key alphanumerically. Suppose the following input is supplied to the program: “Hello There this is Python. Python is good” Then output shall be as follows : Hello : 1 There : 1 This : 1 is : 2 Python : 2 Good : 1
30	Write a Python Program that creates a student class with appropriate members and functions to add student, display student, delete student and search student (Use lists or tuple or named tuple, whatever applicable)
31	Write a Python Program that creates a Student class with various methods. Use setattr() and getattr() on class object
32	Define a class which has at least two methods: getString: to get a string from console input printString: to print the string in upper case.
33	Write a Python Program that creates a class with function overloading
34	Write a Python Program that creates a class and inherit into another class (Base Class : Student with rollno, name, gender, age) (Derived Class : Course with coursename, duration, fee) Use appropriate functions for each class
35	Write a Python program to overload __str__ method of class and print class values in string format. You can do overloading as per your choice but shall be done through __str__ method only.

Marwadi University

FACULTY OF COMPUTER APPLICATIONS
Bachelor of Science (Information Technology)
B.Sc. (IT)

36	Write a program that uses all parts of exception handling in python (try, except, else, finally)
37	Write a file handling program which shall store Name and BirthDate, it should have 3 choices as follows 1) Add Birth Date 2) List All Details 3) Show Today's Birth Days 4) Exit The moment you start the program, it shall first display list of persons who have got birthday today.
38	Create a class of Library with following attributes (title, author, publisher, edition, year of publication, price, type (reference or text book) Class shall have following methods addBook(), modifyBook(), deleteBook(), searcBook(), listBooks(), sortedView() Prepare menu drive program with the data stored in file. Main menu shall have above choices and sorted view shall have further choice of sorting as title, author, publisher, year of publication and price which shall display the data accordingly) (Use list to store the data as follows [[Core Python Programming|WesleyChun|Premier Press|2|2005|550|Text], [Pythong Programming for Beginners|Michael|Premier Press|2|2015|660|Reference], [Head First Python|PaulBerry|O Reilly |4|2014|550|Reference]] Data is separated by pipe sign
39	Create simple project in DJango with "Hello World" page
40	Create simple login application using DJango

FACULTY OF COMPUTER APPLICATIONS
Bachelor of Science (Information Technology)
B.Sc. (IT)