Gyanmanjari
Innovative University

Course Syllabus
Gyanmanjari College of Computer Science
Semester-4 (BSC IT)

Subject: Python Programming– BSCIT14311

Type of course: Minor Stream

Prerequisite: Basic Concept of Programming Language

Rationale:
Python is an open-source, high-level, general-purpose programming language used for software development. It is one of the most popular programming languages in the world today and known for its simplicity as well as rich library. It is a widely used programming language in various domains, such as Automation, Server-side Web Development, Tools Development, Game Programming, Block chain, Data Science, Artificial Intelligence, Machine Learning, Big Data etc. It's relatively easy to learn to use and incredibly versatile. This course aims to teach the basics of Python programming. The course focuses on how to use the building blocks of Python programming to solve different problems. At the end of the course, students will be able to develop simple applications using Python programming.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
				SEE		CCE			
CI	T	P	C	Theory	Practical	MSE	LWA	ALA	
3	0	2	4	75	25	30	20	50	200

Legends:CI-ClassRoomInstructions;T-Tutorial;P-Practical;C-Credit;ESE-EndSemester Examinations; MSE – Mid Semester Examination; V – Viva; CA – Continuous Assessment; ALA – Active Learning Activity.

3 Credits * 25 Marks = 75 Marks (each credit carries 25 Marks) Theory
1 Credits * 25 Marks = 25 Marks (each credit carries 25 Marks) Practical
SEE 100 Marks will be converted in to 50 Marks
CCE 100 Marks will be converted in to 50 Marks
It is compulsory to pass in each individual component.

Course Content:

Sr. No	Course content	Hrs.	Weightage %
1	**Unit 1: Introduction to Python:** Installation and working with Python, History and Features of Python, Writing and Running Python Programs, Input and output, Understanding Python Syntax Variables and Data Types Perform, computations and create logical statements using Python's operators: Arithmetic, Assignment, Comparison, Logical, Membership, Identity, Bitwise operators, list, dictionary, tuple, Set and string operations, Type Casting: Implicit Type and Explicit Type Comments in Python (Single-line & Multi-line)	10	**25%**
2	**Python Decision making and Functions** Write conditional statements using If statement, if ...else statement, elif statement and Boolean expressions, While loop, For loop, range statement, Nested Loop, Infinite loop, Break statement, Continue statement, Pass statement, Plotting data **Functions in python** : Defining and Calling Functions, Function Arguments and Return Values ,Lambda (Anonymous) Functions and map, Recursive Functions	**9**	**25%**
3	**File Handling and Modules:** Working with Files, Opening and closing files, Reading and writing text files, Exception handling for file operations, Introduction to Modules, Importing modules, Creating and using custom modules	**6**	**10%**
4	**Object-Oriented Programming** Introduction to OOP Concepts (Class, Object, Methods, and Properties),Constructors (__init__ method),Inheritance (Single, Multiple, Multilevel, Hierarchical),Polymorphism (Method Overloading & Method Overriding)	**10**	**20%**
5	**Advanced Topics: Database and Framework** **Database Connectivity in Python:** Introduction to Databases, Connecting Python with MySQL using , Executing SQL Queries (Create, Insert, Update, Delete, Select). **Modules, Libraries, and Packages:** Built-in Python Modules (math, random, datetime, os, sys) Introduction to External Libraries (numpy, pandas, matplotlib) Installing and Managing Packages using pip Understanding __name__ == '__main__' Introduction to web frameworks Flask, Django	**10**	**20%**
	Total	**45**	

Continuous Assessment:

Sr. No	**Active Learning Activities**	**Marks**

1	Debugging : Student will be assign a code containing error, student need to Identify error, correct and upload on GMIU web portal	10
2	Code Wars: Compare any four programming language with minimum 10 points or Features, prepare a Documents and upload on GMIU web portal.	10
3	Interview Preparation: The faculty will prepare students for Python technical interview-related questions, and afterward, all questions will be uploaded by students on the GMIU web portal.	10
4	Agile Sprint Challenge: Students will collaboratively outline a step-by-step Agile process for developing a project and prepare documents upload on GMIU web portal	10
5	Mini Project: Student has to prepare a mini-project on given definition or they can choose its own definition. Student have to upload abstract and project in GMIU web portal (Group of Four or Individual) (Framework Flask, Django)	10
Total		50

Suggested Specification table with Marks (Theory):75

Distribution of Theory Marks **(Revised Bloom's Taxonomy)**						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage %	25%	45%	15%	15%	-	-

Course Outcome:

After learning the course, the students should be able to:	
CO1	Students will gain foundational knowledge of Python, including syntax, data types, operators, and basic programming concepts.
CO2	Develop proficiency in decision-making using conditional statements, loops, and control statements, along with function creation, lambda functions, and recursion for efficient problem-solving.
CO3	Aspiring developers will learn file handling operations, including reading, writing, and exception handling, along with understanding modules, importing, and creating custom modules for code reusability.
CO4	Students will understand Object-Oriented Programming (OOP) concepts, including classes, objects, inheritance, polymorphism, and constructors, to develop modular and reusable code.
CO5	Learners will learn database connectivity, SQL query execution, and Python libraries while exploring package management, web frameworks (Flask, Django), and advanced coding concepts.

ListofPractical

Sr. No	Description	Unit No	Hrs
1	Installation of python IDLE, Print Hello, World! Program	1	1
2	Simple calculator(addition, subtraction, multiplication, division)	1	1
3	Write a python program to sort list of dictionary by values using lambda function and perform following method get(),keys(),values(),items(),update(),find(),count()	1	2
4	Basic string operations(concatenation, slicing)and perform following methods upper(),lower(),strip(),split(),join(),repace(),insert(),remove()	1	2
5	Create a shopping list using a list. append(),extend(),pop(),index(),sort(),reverse()	1	2
6	Create a tuple of student information(name,age,grade)	1	1
7	Find the maximum and minimum of two numbers using if-else	2	1
8	Calculate the factorial of a number using function	2	1
9	Checking if a number is even or odd	2	1
10	Create a function to check if a number is prime	2	1
11	Function to calculate the area of a rectangle	2	1
12	Write a program in Python to implement read line, read lines and write line and Write lines file handling contents of a text file	3	1
13	Create a simple calculator module(add, subtract, multiply)	3	1
14	Create a class for representing a bank account	4	2
15	Inherit from a Shape class to create specific shapes(e.g., Circle, Square)	4	2
16	Write a python program to create a class that represents a shape. include methods to calculate its area and perimeter. Implement subclasses for different shapes like circle, triangle, and square.	4	2
17	Write a python program to create a class representing a shopping cart . include methods for adding and removing items , and calculating the total price.	4	2
18	Create Web Database Application “Students Registration” with Options to a) Add/insert a record b) Update a record c) Delete a record	4	2
19	Initialize a simple Flask web application with a route and template	5	2
20	Installation Django and create simple webpage for E-Commerce .	5	2
		Total	30

InstructionalMethod:
The course delivery method will depend upon the requirement of content and need of students.The teacher in addition to conventional teaching method by blackboard, may also use any of tools such as demonstration, role-play, Quiz, brainstorming, MOOCsetc. From the content 10% topics are suggested for flipped mode instruction.

Studentswillusesupplementaryresourcessuchasonlinevideos,NPTEL/SWAYAMvideos, e-courses, Virtual Laboratory.

Practical/Viva Examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

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Reference Books:

[1] *"Python Crash Course"* – **Eric Matthes**
[2]"Learning Python" – **Mark Lutz**
[3]"Django for Beginners" – **William S. Vincent**
[4]*"Flask Web Development"* – **Miguel Grinberg**

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