KU5DSEMAT303: PROGRAMMING IN PYTHON

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
V	DSE	300-399	KU5DSEMAT303	3+1	75

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
3	2	1	35	65	100	1.5

Course Description

This course provides an introduction to programming using the Python language, one of the most popular and versatile programming languages today.

Course Prerequisite

Basic computer literacy**.**

Course Outcomes

CO No.	Expected Outcome	Learning Domains
1	Apply Core Python Syntax and Semantics	Apply
2	Use Data Types and Variables Effectively	Apply
3	Use conditional statements to control the flow of programs	Apply
4	Develop and use functions and modules	Apply

Mapping of Course Outcomes to PSOs							
	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓				✓		
CO 2	✓				✓		
CO 3	✓				✓		
CO 4	✓				✓		

COURSE CONTENTS

Contents for Classroom Transaction

MODULE	UNIT	DESCRIPTION	HOURS
I		**Introduction to Python**	11
	1	(a) Features of Python (b) Variables (c) Indentation in Python (d) Input, Output and Import Functions (e) Operators (Sections 1.1, 1.5, 1.7, 1.11, 1.12 of Essential Readings 1) (1.12.4 and 1.12.7 omitted)	
II		**Data types and Operations**	11
	1	(a) Numbers (b) List (c) Tuples (d) Set (e) Dictionaries (Sections 2.1, 2.3, 2.5, 2.6 of Essential Readings 1).	
III		**Flow Control**	11
		(a) Decision making (b) Loops (c) Nested Loops (d) Control Statements (Section 3.1, 3.2, 3.3, 3.4 of Essential Readings 1).	
IV		**Data visualization**	12
		(a) The Matplot lib Module (b) Plotting mathematical functions, Famous Curves (c) 2D plot using colors (d) Mesh grids (e) 3D Plots (Relevant sections from Essential Readings 2).	

V	**Teacher Specific Module** *Directions for Practicals* **Programmes** 1. Solution of Ax =B using Doolittle method 2. Newton-Raphson's Method 3. Bisection Method 4. Method of false position 5. Trapezoidal rule of Numerical Integration 6. Simpson's Three Eighth rule of Numerical Integration 7. Euler's Modified Method to solve first order differential equation 8. Runge-Kutta Method of Order 4 9. Lagrange's Method for Interpolation 10.Taylor Series Method for initial value problems.	**30**

Essential Readings

1. Dr. Jeeva Jose, Taming Python by Programming, Khanna Publications
2. B.P. Ajith Kumar, Python for Education – Learning Mathematics and Physics using Python and writing them in Latex (Free download from www.iuac.res.in/phoenix).

Suggested Readings

1. J. Kiusalaas, Numerical methods in Engineering with Python, Cambridge University Press.

Assessment Rubrics

Evaluation Type	Marks
End Semester Evaluation (ESE)	**65 (50 T + 15 P)**
Continuous Evaluation (CCA)	**35 (25 T + 10 P)**
Theory (CCA)	**25**
(a) Test paper	10
(b) Assignment	10
(c) Seminar/Viva-voce	5
Practical (CCA)	**10**
(a) Skill	6
(b) Record	4
Total	**100**

* A student has to appear for at least two written tests. Average mark of best two tests is to be considered for internal mark.