PG DEPARTMENT OF COMPUTER SCIENCE				*CLASS: I M.Sc.* Computer Science				
Sem	**Course Type**	**Course Code**	**Course Title**	**Credits**	**Contact Hours/week**	**CIA**	**Ext**	**Total**
I	Major Core – 3	21P1DMC3	Python Programming	4	5	25	75	100

Nature of Course				
Knowledge and skill			Employability oriented	✓
Skill oriented	✓		Entrepreneurship oriented	

Course Objectives

1. To learn and understand the basics of Python programming.
2. To gain Knowledge of handling Strings and Files in Python.
3. To learn the usage of Lists, Tuples, Dictionaries, Classes and Objects in Python programs.
4. To apply the concepts of Inheritance, Overloading and Exception Handling.
5. To implement the techniques like Multiprocessing, Threading, Networking and Graphics.

Unit	Content	Hrs	K-Level	CLO
I	**Basics, Controls Statements, Functions and Modules :** Basics of python Programming: Features of Python – History of Python – The future of Python – Executing Python program – Literal Constants – Variables and Identifiers _ Data Types – Input Operation – Comments – Reserved Words – Indentation – Operators and Expression – Expressions in Python – Operations on Strings – Other Data Types – Type Conversion. Decision Control Statements: Selection / Conditional Branching Statements – Basic Loop Structures / Iterative Statements – Nested Loops – break, continue, pass statement - Functions and Modules.	15	Up to K2	1
II	**Python Strings and File handling :** Python Strings: Concatenating, Appending and Multiplying Strings – Strings are Mutable – Formatting Operator - Built-in String Methods and Functions – Slice Operation – Comparing Strings – Iterating String – The String Module – Regular Expression. File Handling: File Path – Types of Files – Opening and Closing of Files – Reading and Writing Files – File Positions – Directory Methods – CSV files.	15	Up to K3	2
III	**Data Structures, Classes and Objects:** Data Structures: Sequence – Lists -Functional Programming – Tuple – Sets – Dictionaries. Classes and Objects: Classes and Objects – Class Variables and Object Variables – Public and Private Data Members – Private Methods – Built- in Functions – Built-in Class Attributes – Garbage Collection – Class Methods – Static Methods.	15	Up to K3	3

IV	**Inheritance, Operator Overloading, Error and Exception handling:** Inheritance: Inheriting Classes in Python – Types of Inheritance – Composition or Containership or Complex Objects – Abstract Classes and Interfaces. Operator Overloading: Implementing Operator Overloading – Reverse Adding – Overriding. Error and Exception Handling: Errors and Exceptions – Handling Exceptions – Instantiating Exceptions – Built-in and User-defined Exceptions.	15	Up to K4	4
V	**Processes and Threading, Networking, Database Programming and Simple Graphics:** Processes and Threading: Multiprocessing Module – Threading Module. Networking: Creating a TCP Client- Creating a TCP Server. Database Programming: SQL Database. Simple Graphics: Simple Graphics Using Turtle.	15	Up to K5	5

Books for Study

1. Python Programming: Using Problem Solving Approach by Reema Thareja, 2017, Oxford University Press.
2. Programming in Python 3: A Complete Introduction to the Python Language by Mark Summerfield, 2018 second edition, Pearson Education.

Chapters

Text Book 1

Unit I - 3, 4, 5

Unit II – 6, 7, Web Resources 1

Unit III – 8, 9

Unit IV - 10, 11, 12

Text Book 2

Unit V - Chapters 10, 11, 12, Appendix C (from Book 1)

Books for Reference

1. Python for Programmers by Paul Deitel& Harvey Deitel, first edition 2020, Pearson Education Inc.
2. Core Python Programming by R. Nageswara Rao, Second edition 2018, Dreamtech.
3. Programming and Problem Solving with Python by Ashok Namdev Kamthane, Amit Ashok Kamthane, McGraw Hill Education India, 2018.

Web Resources

1. https://realpython.com/python-csv/
2. https://docs.python.org/3/
3. https://cseweb.ucsd.edu/classes/wi14/cse141/pdf/

Rationale for Nature of the course

- Develop wide variety of applications including web applications, software and Game development, Network programming, GUI, Scientific and Numeric applications.

Activities on Skill Oriented

- Practice to write coding
- Quiz
- Seminar

Activities on Employability Oriented

- Software Development
- Data Analysis

Pedagogy

Chalk and talk Materials, PPT, Assignment, Seminar, Group Discussion and Interaction.

Course Designer(s) Name

1. Mrs. K. R. Ramadevi
2. Mrs. S. Rajalakshmi

Lesson Plan

UNIT	Topics to be covered	Hours	Mode
I	Features of Python– Comments – Reserved Words.	3	Lecture, GD
	Indentation – Operators and Expression.	5	Lecture, PPT
	Decision Control Statements	7	Lecture
II	Python Strings.	5	Lecture
	Built-in String Methods and Functions.	5	Lecture, quiz
	File Handling.	5	Lecture
III	Data Structures.	5	Lecture
	Classes and Objects.	5	Lecture, Seminar
	Built- in Functions.	5	Lecture
IV	Inheritance.	5	Lecture, PPT
	Operator Overloading.	5	Lecture
	Error and Exception Handling.	5	Lecture
V	Processes and Threading.	4	Lecture, Assignment
	Networking.	4	Lecture
	Database Programming.	4	Lecture
	Simple Graphics.	3	Lecture

Course Learning Outcomes

On the completion of the course, the students will be able to

CLOs	COURSE LEARNING OUTCOMES	K – Levels
CLO 1	Explain basics, control statements and modules.	**Up to K2**
CLO 2	Classify various string operations and File handling methods.	**Up to K3**
CLO 3	Compare various Data Structures and to implement Classes & Objects	**Up to K3**
CLO 4	Apply the concepts of Object-Oriented Programming.	**Up to K4**
CLO 5	Utilize Standard libraries to perform Multithreading, Networking, Database and Graphics.	**Up to K5**

Mapping of CLOs with POs

CLOs / POs	PO1	PO2	PO3	PO4	PO5	PO6
CLO 1	2	2	1	2	2	1
CLO 2	2	3	2	2	2	2
CLO 3	2	3	3	2	1	1
CLO 4	2	3	3	2	2	2
CLO 5	2	2	2	2	2	1

(3– Advanced Application, 2 – Intermediate Level, 1- Basic Level)

Continuous Internal Assessment (CIA): 25 Marks

Components	Marks	K Level
Test (Average of two tests) (Conducted for 40 marks and converted into 10 marks)	10	(Refer Next Table)
Assignment	5	K4
Seminar	5	K5
Quiz	5	K4
Total	25	

Learning Outcome Based Education & Assessment (LOBE)

Formative - Blue Print – Model for Python Programming
Articulation Mapping – K Levels with Courses Learning Outcomes (CLOs)

Internal	CLOs	K- Level	Section A		Section B (Either/or Choice)	Section C (Open Choice)
			Short Answers			
			No. of Questions	K- Level		
CIA I	CLO 1	Up to K2	2	K1	2(K1&K1)	2(K2)
	CLO 2	Up to K3	3	K1	2(K2&K2)	1(K3)
CIA II	CLO 3	Up to K3	2	K2	2(K3&K3)	2(K3)
	CLO 4	Up to K4	3	K2	2(K4&K4)	1(K4)
Question Pattern (CIA I & II)	No. of Questions to be asked		5		4	3
	No. of Questions to be answered		5		2	2
	Marks for each question		2		5	10
	Total Marks for each section		**10**		**10**	**20**

- *CLO5 will be allotted for individual Assignment which carries five marks as part of CIA component.*

Distribution of Section-wise Marks with K Levels *

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	**Total Marks**	% of Marks without choice	Consolidated %
K1	10	10	-	**20**	33.33	**83**
K2	-	10	20	**30**	50	
K3	-	-	10	**10**	16.67	**17**
K4	-	-	-	**-**	-	**-**
Total Marks	**10**	**20**	**30**	**60**	**100**	**100**
K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	**Total Marks**	% of Marks without choice	Consolidated
K1	-	-	-	**-**	-	**17**
K2	10	-	-	**10**	16.67	
K3	-	10	20	**30**	50	**50**
K4	-	10	10	**20**	33.33	**33**
Total Marks	**10**	**20**	**30**	**60**	**100**	**100**

Learning Outcome Based Education & Assessment (LOBE)
Summative - Blue Print – Model for Python Programming
Articulation Mapping – K Levels with Courses Learning Outcomes (CLOs)

UNITS	CLOs	K- Level	Section A		Section B		Section C (Either/or Choice)	Section D (Open Choice)
			MCQs		Short Answers			
			No of Questions	K - Level	No of Questions	K - Level		
1	CLO1	Up to K2	2	K1& K1	1	K1	2(K1&K1)	1(K2)
2	CLO2	Up to K3	2	K2 & K3	1	K1	2(K2&K2)	1(K3)
3	CLO3	Up to K3	2	K2 & K3	1	K2	2(K3&K3)	1(K3)
4	CLO4	Up to K4	2	K3 & K4	1	K2	2(K4&K4)	1(K4)
5	CLO5	Up to K5	2	K3 & K4	1	K3	2(K4&K4)	1(K5)
No. of Questions to be asked			10		5		10	5
No. of Questions to be answered			10		5		5	3
Marks for each question			1		2		5	10
Total Marks for each section			10		10		25	30

- K1 – Remembering and recalling facts with specific answers
- K2 – Basic understanding of facts and stating main ideas with general answers
- K3 – Application oriented – Solving Problems
- K4 – Examining, analyzing, presentation and make inferences with evidences
- K5 – Ability to integrate ideas from one situation to newer situations.

Distribution of Section – wise Marks with K Levels *

K Levels	Section A (No Choice)	Section B (No choice)	Section C (Either/or)	Section D (Open choice)	Total Marks	% of Marks without choice	Consolidated
K1	2	4	10	-	**16**	13.33%	13%
K2	2	4	10	10	**26**	21.67%	22%
K3	4	2	10	20	**36**	30%	30%
K4	2	-	20	10	**32**	26.67%	27%
K5	-	-	-	10	**10**	8.33%	8%
Total Marks	10	10	50	50	**120**	100	100