Faculty of Computer Science & Applications
Master of Computer Application (MCA)
(W. E. F.: 2023-24)

Document ID: SUTEFCAM-01

Name of Faculty	:	Faculty of Computer Science & Applications
Name of Program	:	Master of Computer Application (MCA)
Course Code	:	2MCA04
Course Title	:	Python Programming
Type of Course	:	Professional Core
Year of Introduction	:	2023-24

Prerequisite	:	Computer Fundamentals
Course Objective	:	Learn the fundamentals of python and fluent in the use of control flow statements, in the handling of strings and functions. Understand the methods to create and manipulate python programs by utilizing the data structures like lists, dictionaries, tuples, and sets. Understand the use of operations involving file systems and regular expressions. To Articulate the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python along with magic methods.
Course Outcomes	:	At the end of this course, students will be able to:
	CO 1	Interpret the fundamental python syntax, semantics and fluent in the use of python control flow statements. Express proficiency in the handling of strings and functions.
	CO 2	Determine the methods to create and manipulate python programs by utilizing the data structures like lists, dictionaries, tuples and sets.
	CO 3	Identify the commonly used operations involving file systems and regular expressions.
	CO 4	Articulate the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python along with magic methods.

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			**Credits**	**Examination Marks**				
				Theory Marks		**Practical Marks**		**Total**
L	**T**	**P**	**C**	**SEE**	**CIA**	**SEE**	**CIA**	**Marks**
2	0	4	4	70	30	30	20	150

*Legends: **L**-Lecture; **T**–Tutorial/Teacher Guided Theory Practice; **P** – Practical, **C** – Credit, **SEE** – Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars /Presentations/MCQ Tests, etc.))*

Course Content

Unit No.	Topics	Hrs.	Weightage	Mapping with CO
1.	**Basics of Python:** Using the Python Interpreter, Variables, Identifiers and Keywords, Numbers and Expressions	2	07 %	CO1
2.	**Data Structures: List, Tuples, Dictionaries and Strings:** Common Sequence Operations: Indexing, Slicing, Adding Sequences, Multiplication, Membership, Length, Minimum, and Maximum, Using Lists as Stacks, Using Lists as Queues, List Comprehensions, Nested List Comprehensions, the del statement, Tuples and Sequences, Sets, Dictionaries, Comparing Sequences and Other Types, Basic String Operations	3	12 %	CO1 CO2
3.	**Control Structures and Functions: Conditional Branching**- if Statements, break and continue Statements, and else Clauses on Loops, pass Statements **Loops-** while Loops, for Loops, Defining Functions, More on Defining Functions: Default Argument Values, Keyword Arguments, Arbitrary Argument Lists, Unpacking Argument Lists, Lambda Expressions, Documentation Strings, Function Annotations	3	12%	CO2
4.	**Modules and Scoping Rules:** Executing modules as scripts, The Module Search Path, "Compiled" Python files, Packages: Importing * From a Package, Intra-package References, Packages in Multiple Directories	2	07%	CO2
5.	**Exception Handling:** Syntax Errors, Exceptions, Handling Exceptions, Raising Exceptions, User-defined Exceptions, Defining Clean-up Actions, Predefined Clean-up Actions	4	12%	CO3
6.	**Magic Methods, Properties and Iterators:** Constructors, Item Access: The Basic Sequence and Mapping Protocol, Properties: The property Function, Static Methods and Class Methods, getattr, setattr , and Friends, Iterators, Generators, Generator Expressions	4	12%	CO3
7.	**Object Oriented Programming:** Python Scopes and Namespaces, Class Definition, Class Objects, Instance Objects, Method Objects, Class and Instance Variables, Inheritance, Multiple Inheritance, Private Variables, Polymorphism, Using Properties to Control Attribute Access, Creating Complete Fully Integrated Data Types	5	15%	CO3

8.	**Regular Expression and File Handling:** What is a regular expression? Regular expressions with special characters, Regular expressions and raw strings, Extracting matched text from strings, Substituting text with regular expressions, Writing and Reading Binary Data, Writing and Parsing Text Files, Iterating	3	13%	CO4
9	**Graphics with Turtle:** Explain turtle graphics module, implement graphics using turtle, use loops and conditional statements to draw graphics	4	10%	CO4

Suggested List of Experiments/Tutorials

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**30%**	**40%**	**30%**	**-**	**-**	**-**

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Experiment on Lists	4
2	Experiment on Tuples	4
3	Experiment on Dictionaries	4
4	Experiment on Strings	4
5	Experiment on Control Structures and iterators	4
6	Experiment on Functions and magic methods	6
7	Experiment on Modules and scoping rules	6
8	Experiment on Exception handling	6
9	Experiment on Regular expressions	6
10	Experiment on file handling	8
11	Experiment on graphics using turtle	8

Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	Python IDLE
2	Anaconda Python
3	PyCharm

Suggested Learning Websites

Sr. No.	Name of Website
1	https://www.python.org/
2	http://www.diveintopython3.net/
3	http://www.diveintopython3.net/
4	https://developer.mozilla.org/en-US/docs/Learn/Server-side/Django
5	https://www.fullstackpython.com/django.html

Textbook:

Sr. No.	Name of Reference Books
1	Magnus Lie Hetland, "Beginning Python From Novice to Professional", Third Edition, Apress,2017
2	Magnus Lie Hetland, "Beginning Python From Novice to Professional", Third Edition, Apress,2017
3	Nigel George, "Mastering Django: Core" Packt Publishing, 2016

Reference books:

Sr. No.	Name of Reference Books
1	David Beazley, Brian K. Jones, "Python Cookbook", 3rd edition,OREILLY,2016
2	Brett Slatkin, "Effective Python: 59 Specific Ways to Write Better Python", Novatec, 2016
3	Allen Downey, "Think Python: How to Think Like a Computer Scientist", Green Tea Press,2015
4	Mark Lutz "Learning Python", 4th Edition, O'REILLY, 2016
5	Arun Ravindran, Aidas Bendoraitis, Samuel Dauzon, "Django: WebDevelopment with Python",Packt Publishing, 2016