AURO UNIVERSITY
Integral & Transformational Learning

School of Information Technology (IT)
AURO University, Surat, Gujarat.

Curriculum
for
Master of Science(M.Sc) in Artificial Intelligence(AI)
(2022-23)
(With effect from 2022-23)

AURO University Program Outcomes (PO)		
Learners are expected to know and be able to–		
PO1	**Knowledge**	Ability to build (either independently or by joining a higher academic program) one of the core IT concepts learned in the course. Ability to apply the core computer science concepts to solve the problems in the IT industry
PO2	**Problem analysis**	Students are equipped with skills to solve computational problems in their workplace and for society
PO3	**Professional Ethics**	Apply ethical principles and commit to professional ethics and responsibilities and norms of the IT practice
PO4	**Individual and teamwork**	Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings
PO5	**Modern tool usage**	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling to complex engineering activities, with an understanding of the limitations.
PO6	**Communication**	Students demonstrate effective communication presentation skills while interacting with professional peers and in society
PO7	**Scientific reasoning**	Given a problem. The students will be able to analyze it, suggest solutions, and critically evaluate the solutions proposed by others
PO8	**Integral Learning**	Recognize the need for, and have the preparation and ability to engage in independent and lifelong integrated learning in the broadest context of technological change

AURO University First Year of M.Sc-AI (2022 Course) Python Programming		
Teaching Scheme:	**Credit**	**Evaluation Scheme:**
TH: 03 Hours/Week **PR: 02 Hours/Week**	**04**	**Continuous Assessment(TH): 50 Marks** **End_Semester(TH): 50 Marks**
Prerequisite Courses, if any: Basic of Computer Fundamentals		
Companion Course, if any: ---		

Course Objectives:

- To understand the fundamentals of python programming.
- Understand and implement the various data structures of Python.
- Solve the real-world problems using Object-oriented approach.
- Formulate problems precisely, design the GUI solutions, handle the exceptions and connect with database system.

Course Outcomes:

On completion of the course, learner will be able to–

CO1: Understand the fundamentals concepts of Python Programming.

CO2: Apply the concepts of conditional statements and control structures of Python.

CO3: Understand and apply the concepts of different data structures of Python like List, Tuple and Dictionary.

CO4: Experiment the built-in packages and their functions in AL & ML.

CO5: Solving the mathematical problems using Object Oriented concepts.

CO6: Developing the programs using the concept of Multithreading, File and Database handling.

Course Contents

Unit I	Basics of Python	(10Hours)

History of Python, Features, Installing Python with IDE, Data types: Numbers, Strings(Inbuilt functions for String, The index[] operator, Traversing String, Immutable strings, String Operators, String operations), Statements & Comments, Python Operators, Python Global, Local and Nonlocal variables, Namespace and Scope, Python if...else, Python for Loop, while Loop, break and continue, Pass Statement.

#Exemplar/Case Studies	
Mapping of Course Outcomes for Unit I	CO1, CO2 Blooms Level : 1,2

Unit II	Functions and Package	(8 Hours)

Python Function, Function Argument, Python Recursion, Anonymous Function, Python Modules, Python Package, Date and Time module, Python Anonymous/Lambda Function, Python Decorators, Python Generators, Difference b/w generator function and normal function.

#Exemplar/Case Studies	
Mapping of Course Outcomes for Unit II	CO4 Blooms Level : 3,4

Unit III	OOPs using Python	(10 Hours)

Introduction, Defining a Class, Adding attributes and methods to a class, Constructor and Destructor, Creating Objects, Method Overloading in Python, Operator Overloading, Inheritance: **Multiple and Multi-level**, **Method Resolution Order in Python**, Method Overriding.	
#Exemplar/Case Studies	Solve the real-world problems using OOPs concept.
Mapping of Course Outcomes for Unit III	CO5 Blooms Level : 3,4

Unit IV	**Exception and Multithreading**	**(10 Hours)**
Exceptions, Exception Handling, Types of Exceptions, The Except Block, The assert Statement, User Defined Exceptions.		
#Exemplar/Case Studies	Producer-Consumer Problem, User-defined Exception	
Mapping of Course Outcomes for Unit IV	CO6 Blooms Level : 3,4	

Unit V	**File and Database Handling**	**(12 Hours)**
Introduction, Text Input and Output: Opening a file, Writing text to a file, Reading text from a file, Appending data; Seek() function, Binary files: Reading Binary files, Accessing and Manipulating files, Working with MySQL Database, Using MySQL from Python.		
#Exemplar/Case Studies	Algebraic Expression tree, Tic-tac-toe game tree	
Mapping of Course Outcomes for Unit V	CO6 Blooms Level : 3,4	

Unit VI	**Intro. To ML Packages**	**(6 Hours)**
Intro to Data Science using Python, Use of NumPy, Scikit-Learn and Pandas library, Intro to Tensorflow and Keras, Introduction, Image processing basic operations, Computer vision features, Overview of OpenCV, Numpy and Matplotlib python library, Use cases of Image Processing and Computer Vision.		
#Exemplar/Case Studies		
Mapping of Course Outcomes for Unit VI	CO4	

Learning Resources

Text Books:

1. Wesley J. Chun, “Core Python Programming”, Prentice Hall PTR First Edition
2. Ashok Namdev Kamthane, “Programming and Problem Solving with Python”, Tata McGraw Hill

Reference Books:

1. Martin C. Brown, “Python: The Complete Reference”, Tata McGraw Hill
2. Paul Berry, “Head First Python”, O’Reilly Publication
3. Magnus Lie Hetland, “Beginning Python”, APress Publication
4. R. Nageswara Rao, “Core Python Programming”, DreamTech Publication

e-Books

MOOC Courses: Python Tutorial For Beginners, CodewithHarry

@The CO-PO Mapping Table

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8				
CO1	3	3	3	2	-	-	1	2				
CO2	3	3	3	2	-	-	2	-				
CO3	3	3	3	2	2	2	-	-				

CO4	3	3	3	2	2	1	-	2				
CO5	3	3	3	2	2	-	2	3				
CO6	3	3	3	2	2	-	2	3				

Assessment Criteria and Schedule

Student performance in the course will be assessed via both continuous assessment (50%) and end-term practical examination (50%). The assessment is divided into assessment marks as under:-

Sr. No	Assessment Event	Marks (%)	Evaluation week	Remark
1	Mid Term	20 (20%)	8th	Mid-Term
2	Lab Test	20 (20%)	12th	Based on Python
3	Assignment	10 (10%)	4th	
4	End-term examination (Date to be announced later)	100 (50%)		
TOTAL		**100**		

AURO University Second Year of Master of Science-AI (2022 Course) 210252: Mathematics III		
Teaching Scheme:	**Credit**	**Evaluation Scheme:**
TH: 04 Hours/Week	**04**	**Continuous Assessment(TH): 50 Marks** **End_Semester(TH): 50 Marks**
Prerequisite Courses, if any:		
Companion Course, if any:		
Course Objectives: •		
Course Outcomes: CO1:		
Course Contents		
Unit I	**U**	**(07 Hours)**
#Exemplar/Case Studies		
Mapping of Course Outcomes for Unit I	C	Blooms Level : 1,2
Unit II	**U**	**(07 Hours)**
#Exemplar/Case Studies		
Mapping of Course Outcomes for Unit II		
Unit III	**Unit Title**	**(06 Hours)**
#Exemplar/Case Studies		
Mapping of Course Outcomes for Unit III	C02	Blooms Level : 1,2
Unit IV	**Unit Title**	**(06 Hours)**
#Exemplar/Case Studies		
Mapping of Course Outcomes for Unit IV		Blooms Level : 1,2
Unit V	**Unit Title**	**(06 Hours)**

#Exemplar/Case Studies		
Mapping of Course Outcomes for Unit V		
Unit VI	**Unit Title**	**(06 Hours)**
#Exemplar/Case Studies		
Mapping of Course Outcomes for Unit VI	CO2	Blooms Level : 1,2

Learning Resources

Text Books:

1.

Reference Books:

1.

Mapping of Cos with Pos and PSOs

@The CO-PO mapping table												
PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1	3	1	-	-	-	-	1	-	-	1
CO2	3	2	3	1	-	-	-	-	1	-	-	-
CO3	3	2	3	1	-	-	-	-	1	-	-	-
CO4	3	2	3	1	1	-	-	-	1	-	-	-
CO5	3	2	3	1	1	-	-	-	1	-	-	1
CO6	3	2	3	1	1	-	-	-	1	-	-	1