GITAM INSTITUTE OF MANAGEMENT (GIM)
Gandhi Institute of Technology and Management (GITAM)
(Declared as Deemed to be University u/s 3 of UGC Act. 1956)
Visakhapatnam – 45.

Course Code: MAN 224	**Course Title: Data Analysis with Python**	
Semester: IV	**Course Type: Practical**	**Credits: 3**
Home Programme(s): BBA (Business Analytics)	**Batch: 2020 - 23**	
Course Leader:		

Course description and learning outcomes

Python is an open source high level interpreter based language. Python is interactive and object oriented language with wide range of applications. Python is commonly used in the area of data science and web based analytics.

Learning Objectives

- Understand the analytics features of python (L1)
- Get hands on experience in build data applications with python (L2)

On successful completion of this course, students will be able to:

CO	Learning Outcome	Assessment
CO1	Understand the language elements of Python	A1,
CO2	Understand the OOP concepts in Python	A1, A2, A3
CO3	Write programs in python	A1, A2, A3
CO4	Use python for data analysis	A2, A3, A4
CO5	Use python for data visualization	A2, A3, A4

Course outline and indicative content

UNIT–I (CO1, L1)
Introduction : Features of Python, Setting up path, Variables and Data types, Operators in Python, Input – Output Statements, Control Structures: Conditional Statements, Looping Statements, Control Statements

UNIT–II: (CO2, L1)
Data Structures of Python : Strings, Lists, Tuples, Dictionaries, Functions: Defining and calling a function, Types of Function; Modules: Importing Module, Packages, Composition, Exception Handling. **OOP Concepts and Regular Expressions**: OOP concepts in Python, Regular Expressions: Match Function, Search Function, Matching Vs Searching, Modifiers, Patterns, Working with Database.

UNIT–III (CO3, L2)
Python for Data Analysis – I : NumPy Basics: Arrays and Vectorized Computation, Pandas Basics: Working with Series and DataFrame; Scipy Basics: Random Variables, Building specific distributions, Univariate analysis, Bivariate and multivariate analysis.

UNIT–IV (CO4, L2)
Python for Data Analysis– II : Pandas for Data Analysis: I/O tools; Series, Data frames, arrays, Indexing & selecting data, Merge, Join and Concatenate; Reshaping and Pivot tables; Working with missing data; Working with numerical and categorical data.

UNIT–V (CO5, L2)

Advanced Visualizations: Python packages for plotting and visualizations; Introduction to Matplotlib package; Subplots, axes and figures; Text, Labels and Annotations; Managing colors; Working with lines, dates and text on plots; Scatter plots; Pie and Polar charts; Bar charts and Histograms; Plotting discrete distributions; Plotting categorical variables; Plotting images, contours and fields; Visualizations for statistics; Animations.

Assessment methods

Task		Task type	Task mode	Weightage (%)
A1	Quiz (2)	Individual		40
A2	Assignments / Lab Tasks / Written Test/ Coursera Groups* or Individual (3)	Individual / Group		30
A3	Project	Individual		20
A4	Presentation	Individual		10

Mapping Cos – Blooms Levels – Assessment Tools

Knowledge dimension / Cognitive dimension	L1. Remember	L2. Understand	L3. Apply	L4. Analyze	L5. Evaluate	L6. Create
Factual Knowledge						
Conceptual Knowledge	CO1 (A1, A2)	CO1, CO2 (A1, A2, A3)	CO2, CO3, CO4 (A1, A2, A3)	CO3 (A3)	CO3, CO4(A3, A4)	
Procedural Knowledge		CO1, CO2, CO3 (A1, A2, A3)	CO2 (A3, A4)	CO4 (A3)	CO3, CO4 (A3, A4)	CO3, CO4 (A3, A4)
Meta Cognitive Knowledge						CO3, CO4(A3, A4)

Learning and teaching activities

Classroom Lectures, Application cases and exercises, Demonstration, Lab Sessions

Teaching and learning resources

Computer Lab, Python Software, Textbooks, Ebooks, Reference Materials, Web resources

CO PO Mapping

This is to map the level of relevance of the Course Outcome (CO) with Programme Outcome (PO).

0= No Relevance; 1= Low Relevance; 2= Medium Relevance; 3= High Relevance

CO PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	Sum
CO1	0	0	0	0	0	0	0
CO2	0	1	3	3	1	3	11
CO3	0	3	3	3	2	2	13

CO4	**0**	**2**	**2**	**3**	**2**	**3**	**12**
CO5	**0**	**2**	**3**	**2**	**1**	**3**	**11**
Target Level Max.	**0**	**8**	**11**	**11**	**6**	**11**	**47**

Program Outcomes

1	Ability to understand the business problem with their knowledge in different functional areas of management
2	Ability to work with structured, semi – structured and unstructured data.
3	Ability to use tools such as Microsoft Excel, SPSS, R, Weka and Tableau to solve business analytics problem
4	Ability to apply analytics techniques to analyze and interpret the data.
5	Ability to perform descriptive, predictive and prescriptive analytics.
6	Have necessary skills and understanding to take up advanced topics in the area of analytics and thus enhance their career.