INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

DATA VISUALIZATION LABORATORY								
III Semester: MBA								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
CMBE45	**Core**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		1	**-**	**2**	**2**	40	60	100
Contact Classes: 10	**Tutorial Classes: Nil**	**Practical Classes: 25**				**Total Classes: 35**		
Prerequisite: Basic concepts of Information Technology								
SDGs Mapped: SDG 4 (Quality Education), SDG 9 (Industry, Innovation and Infrastructure)								

I. COURSE OVERVIEW:

The main aim of the course is to help the students gain a well-rounded introduction to it for manager's laboratory learning and its significance in their day to day life. Moreover, the course pays special attention to develop understand and implement computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient analysis and design of computer-based systems of varying complexity., career building and different methods of job searching.

II. COURSES OBJECTIVES:

The students will try to learn:

I. The application of Statistical tools to Research Problem / Projects.
II. The statistical tools for decision making.
III. How to work with MS Excel for hypotheses testing.
IV. The different types of formulas and functions in MS Excel.
V. The results for better decision making.

III. COURSE OUTCOMES:

At the end of the course students should be able to:

CO1 Analyze the functions in MS-Office and statistical packages to prepare presentations

CO2 Identify, formulate, and solve managerial problems by creating templates.

CO3 Understand the various formats in business instructions.

CO4 Enhancing knowledge of contemporary issues securing data from external sources.

CO5 Illustrate various parts of corporate reports and business proposals.

CO6 Ensuring measures of dispersion for data analysis.

IV. COURSE CONTENT:

WEEK – 1: INTRODUCTION TO DATA

Data, information and knowledge – measurement scales – variable selection – type conversion – statistical

WEEK-2: INTRODUCTION TO VISUALIZATION

Model – algorithmic model – history of visualization – gestalt's principles – seven stages of data visualization – data science process – types of charts – chart selection guide

WEEK-3: UNDERSTANDING VISUALIZATION

Best visualization practices – effectiveness of visual encodings – color design principles

WEEK-4: VISUALIZATION PRINCIPLES

Edward Tufte's design principles – data – ink ratio – minimizing chart junk – minimizing lie factor

WEEK-5: UNDERSTANDING INTERFACE

Connecting to data sources – tables – charts – dashboards – stories

WEEK-6: DEPLOYMENT OF STRUCTURED DATA

Deployment of Unstructured data Visualization of unstructured data

WEEK-7: TEXT DATA

Text data visualization – forms of text data

WEEK-8: WORD MEASUREMENT

Word cloud – word tree

WEEK-9: PLOTS

Joint plot – subjectivity and objectivity

WEEK-10: VISUALIZING NETWORKS

Visualizing networks – visual storytelling

WEEK-11: DASHBOARDS

Storytelling frameworks – data storytelling

WEEK-12: STORY NARRATION

Narrative storytelling – analytical dashboard – misleading charts and graphs – cherry picking data

WEEK-13: CORRELATION AND CAUSATION

Correlation and causation – Simpson's paradox

WEEK-14: SCALING

Scaling – drill down bias – data discrepancy

V. TEXTBOOKS:

1. Jonathan Schwabish, Data Visualization in Excel, Routledge
2. Sharada Sringeswara, Purvi Tiwari, U. Dinesh Kumar, Data Visualization, Wiley,2022

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VI. REFERENCE BOOKS:

1. Mathew O.ward, Georges Grinstein, Daniel Keim, Interactive data Visualization, Routledge, 2015.
2. Seema Acharya, Mastering Data Visualization using Tableau, Wiley, 2024

Note: Laboratory work can be done using Spreadsheets /Power BI/ Tableau