Course: MIS 6326 – Data Analysis and Visualisation (DS)

Level: MIS Year 2  
Location: Lubaga  
Lecture Hours: 45  
Practical Hours: 30  
Credit Units: 4

Course Description

Covers foundational principles and hands-on techniques for analyzing data and presenting it visually for decision-making.

Course Objectives

Students will learn to:

Understand core concepts of data analysis and visualization

Conduct data exploration and preprocessing

Perform statistical analysis

Develop visualizations

Apply ML to data analysis

Use Python and R for data analytics

Address data ethics and interpretation

Learning Outcomes

Students should be able to:

Use data visualization tools effectively

Conduct EDA and statistical analysis

Apply ML techniques to datasets

Create visual dashboards (e.g., with Tableau)

Tackle real-world business problems with data

Discuss emerging trends in data analytics

Indicative Content

Introduction to Data and Visualization Tools

EDA: Descriptive statistics, handling missing data

Statistical Analysis: Hypothesis testing, regression

Visualization Techniques: Graph types, dashboards

ML for Data Analysis

Data Ethics and Interpretation

Real-world Applications and Case Studies

Assessment:

Coursework: 50%, Final Exam: 50%, Pass mark: 60%

Course Delivery Plan: 6 Weeks (Aug 8 – Sept 15, 2025)

Total Contact Hours: 60 (45 Lecture + 30 Practical hours)  
Delivery Mode: Blended (in-person + online)

Weekly Timetable Slots:

* Friday: 5:00 PM – 9:00 PM → 4 hours
* Saturday Morning: 9:00 AM – 11:00 AM → 2 hours
* Saturday Afternoon: 12:00 PM – 6:00 PM → 6 hours  
   Total per week = 12 hours x 6 weeks = 72 available hours

Weekly Plan Breakdown

Week 1 (Aug 8–9)

Theme: Foundations of Data Analysis & Visualization

* Introduction to course & tools (Python, R, Tableau)
* Concepts: data types, variables, decision-making use
* Software installations + environment setup  
   Practical: Hands-on with Jupyter, RStudio, sample datasets

Week 2 (Aug 15–16)

Theme: Data Exploration & Preprocessing

* Descriptive statistics, missing data, normalization
* EDA techniques  
   Practical: Cleaning and transforming real-world datasets (Python/Pandas, R/tidyverse)

Week 3 (Aug 22–23)

Theme: Statistical Analysis for Insights

* Inferential statistics, hypothesis testing
* Regression, correlation, probability distributions  
   Practical: Stats in Python (Scipy, Statsmodels) and R

Week 4 (Aug 29–30)

Theme: Data Visualization Principles + Tools

* Visualization theory (color, design, chart types)
* Matplotlib, Seaborn, ggplot2  
   Practical: Create visualizations using Python and R  
   Mini project briefing

Week 5 (Sept 5–6)

Theme: Advanced Visualization + Machine Learning

* Interactive dashboards (Plotly, Tableau)
* Intro to ML (supervised vs unsupervised), feature engineering  
   Practical: Dashboard creation + ML using scikit-learn / R

Week 6 (Sept 12–13)

Theme: Ethics, Business Decision-Making, & Trends

* Data ethics, fairness, responsible communication
* KPIs, BI tools, strategy
* Trends: AI-powered analytics, augmented analytics  
   Project completion & presentation prep

Final Practical Assessment + Exam

* Exam Date: Sept 21st, 2025
* Format: 50% Coursework (projects, practicals) + 50% Written Exam
* Present final group projects + submit reports

Coursework Breakdown Suggestion

| Component | Weight |
| --- | --- |
| Weekly Practicals | 20% |
| Midterm Assignment | 10% |
| Final Project & Report | 20% |
| Final Exam | 50% |
| Total | 100% |