



SILVER OAK UNIVERSITY
School of Technology, Design And Computer Application
Silver Oak College of Computer Application
Master of Science Data Science
Course Name: Data Analytics Using Tools-Practical
Course Code: DSM5042C
Semester: 2nd

Prerequisite: Fundamental knowledge of data management and basic statistical concepts, along with prior experience in using spreadsheets, elementary data visualization techniques, and familiarity with analytical reasoning and structured problem-solving approaches.

Course Objective: To develop students' competencies in data analytics by enabling them to systematically acquire, process, explore, visualize, and interpret data; apply appropriate statistical and analytical techniques; design and implement predictive and prescriptive analytics workflows; and generate actionable insights to support informed, data-driven decision-making in both academic and professional environments.

Teaching Scheme:

Teaching Scheme				
L	T	P	Contact Hours	Credit
0	0	4	4	2

List of Practicals:

Total Hours: 56

Sr. No.	Practical Name
1	The structured examination of data to extract patterns and insights supporting informed decision-making.
2	Classification of analytical approaches into descriptive, diagnostic, predictive, and prescriptive methods.
3	Categorization of data based on organization, format, and structure to determine analytical suitability.
4	Identification of repositories and systems that generate or provide access to data for analysis.
5	Standardized framework defining the phases of a data analytics project from understanding objectives to deployment.
6	Concepts related to storage, integration, and pattern discovery in large datasets.
7	Policies and standards ensuring responsible, secure, and compliant handling of data.
8	Structured sequence of analytical tasks within an environment designed for systematic data evaluation.
9	Acquisition and integration of raw data from multiple sources into an analytical environment.
10	Standardized data representation and conversion for analysis.
11	Processes that identify and correct errors, inconsistencies, and anomalies in datasets.
12	Characterization of incomplete datasets and data from diverse sources/formats.
13	Standardization and organization of data into analytically meaningful subsets.

14	Preliminary statistical examination to reveal patterns, distributions, and relationships.
15	Structured analysis of tabular data for summarization and interpretation.
16	Management of structured and semi-structured data formats in spreadsheet applications.
17	Preparation of datasets for analysis through cleaning and transformation.
18	Enhancement of dataset quality and restructuring of data for analysis.
19	Graphical representation to identify trends, patterns, and insights.
20	Summarization of data characteristics using measures of central tendency and dispersion.
21	Quantification of relationships and dependencies among variables.
22	Examination of sequential data over time to identify trends and temporal patterns.
23	Overview of software platforms providing modular, flexible, and cost-effective analytical workflows.
24	Structured ingestion and preparation of data within a workflow-based analytics platform.
25	Representation and statistical exploration of datasets through modular workflow operations.
26	Analytical models that assign datasets into predefined classes based on patterns.
27	Analytical methods to identify inherent groupings within datasets without predefined labels.
28	Data mining techniques to discover patterns, relationships, and clusters in datasets for actionable insights.

Course Outcome:

Sr.No.	CO-Statement	Practical No.
CO-1	Describe fundamental concepts of data analytics, types of analytics, data types, data sources, CRISP-DM methodology, and ethical governance principles.	1 to 7
CO-2	Execute data gathering, processing, cleaning, transformation, and exploratory data analysis techniques for handling missing and heterogeneous datasets.	8 to 14
CO-3	Examine datasets using statistical measures, correlation, regression, visualization, and time-series techniques in EXCEL to derive meaningful insights.	15 to 22
CO-4	Design and utilize analytics workflows using KNIME and WEKA for classification, clustering, and association mining in industry-oriented case studies.	23 to 28

Teaching & Learning Methodology:

1. Lecture-Based Learning
2. Hands-On Labs and Practical Sessions
3. Project-Based Learning
4. Group Activities and Collaborative Learning
5. Active Learning Strategies

Major Equipment:

1. Computers/Laptops with internet connectivity
 2. Projector and display system for demonstrations

Books Recommended:

1. *Data Science for Business* by Foster Provost and Tom Fawcett
 2. *Practical Statistics for Data Scientists* by Peter Bruce, Andrew Bruce, and Peter Gedeck

List of Open Source Software/learning website:

1. Jupyter Notebook / Google Colab
 2. Kaggle (Datasets and Notebooks)
 3. RStudio (for statistical analysis)
 4. GitHub (Project repositories)
 5. Coursera / edX / Udemy (Analytics courses)
 6. OpenRefine (Data cleaning)

CO-PO-PSO MATRIX: