GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Business Administration

Level: PG

Course / Subject Code: MB04092101

Course / Subject Name: Software Proficiency

w. e. f. Academic Year:	2025-26
Semester:	4
Category of the Course:	Interdisciplinary Elective (Minor 2)

Prerequisite:	Should have undergone a course in Research Methodology and Statistics
Rationale:	This course equips students with essential software skills for data analysis, visualization, and research, integrating tools like Excel, SPSS/JAMOVI, Python/R, and AI-powered platforms. It bridges the gap between theoretical knowledge and practical application by enabling students to analyze complex datasets, derive insights, and present findings effectively. The course enhances research productivity and decision-making capabilities, preparing students for data-driven roles in business and academia.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level
01	Apply data analysis techniques using Microsoft Excel to perform descriptive and inferential statistics, create visualizations, and develop simple forecasting models for business decision-making	Apply, Analyze
02	Conduct advanced statistical analysis using SPSS/JAMOVI, including hypothesis testing, regression, and multivariate techniques, and interpret results for research and managerial insights.	Analyze, Evaluate
03	Demonstrate proficiency in Python/R programming for data manipulation, statistical modeling, and handling large datasets using relevant libraries and big data frameworks.	Apply, Create
04	Utilize AI-powered research tools for literature discovery, summarization, citation mapping, and knowledge organization to enhance efficiency in academic and applied business research.	Understand, apply, Evaluate
05	Integrate software tools (Excel, Power BI/Tableau, SPSS/JAMOVI, Python/R, AI research tools) to solve practical business and research problems, and effectively communicate insights through reports and presentations.	Evaluate, Create

**Revised Bloom's Taxonomy (RBT)*

Teaching and Examination Scheme:

Teaching Scheme (in Hours)	Total Credits L+T+ (PR/2)	Assessment Pattern and Marks	Total Marks

L	T	PR	C	Theory		Tutorial / Practical		
				ESE (E)	PA / CA (M)	PA/CA (I)	ESE (V)	
3	1	0	4	70	30	50	0	150

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	**Foundational data analysis with Microsoft Excel** • Data preparation and cleaning: Organizing raw data for analysis. • Statistical functions: Using built-in functions for descriptive statistics (e.g., mean, median, standard deviation) and inferential statistics (e.g., ANOVA). • Data visualization: Creating charts, pivot tables, and histograms to visually represent data and identify trends. • Modeling and forecasting: Building and evaluating linear regression models and using "Goal Seek" to make operational decisions. **Business intelligence and data visualization** • Tableau or Power BI: Building interactive dashboards and reports. • Data storytelling: Communicating insights from data effectively to stakeholders using data visualization.	10	25
2.	**Advanced statistical analysis with SPSS / JAMOVI** • Introduction to SPSS and JAMOVI: Understanding the interface, data view, and variable view. • Descriptive statistics: Generating and interpreting frequency distributions and measures of central tendency. • Hypothesis testing: Conducting and interpreting t-tests, Chi-square analysis, and ANOVA. • Correlation and regression: Analyzing relationships between variables, including simple, multiple, and logistic regression. • Multivariate analysis: Using advanced techniques such as factor analysis, conjoint analysis, and cluster analysis.	12	25
3.	**Data management and programming with Python/R** • Programming for business analytics: Introduction to programming concepts in Python or R. • Data manipulation: Using libraries like Pandas (Python) or the tidyverse (R) to clean, transform, and manage data.	10	25

	• Advanced statistical modeling: Conducting advanced analyses, including time-series forecasting. • Big data technologies: Introduction to handling massive datasets using frameworks like Hadoop.		
4.	**AI Powered Tools for Research:** **Literature Discovery & Review** • Elicit – find and summarizes papers based on natural language queries. • Connected Papers – Visualizes related research papers in a graph to explore connections. • Research Rabbit – Builds networks of papers and authors for easier exploration. • Litmaps – Tracks research trends and generates citation maps. • Scite – Shows how papers are cited (supporting, contrasting, or mentioning). **Reading & Summarization** • Scholarcy and Explainpaper – Summarizes academic papers into digestible formats. • Paper Digest – Creates concise summaries of long research papers. • ChatGPT / Claude – Can analyze and explain papers when you provide text or PDF excerpts. • NotebookLM – summarization and discourse on papers. **Productivity & Organization** • Zotero – Reference management with AI-enhanced summaries. • Notion AI / Obsidian with plugins – Organizing notes, connecting literature, and AI summarization. • ReadCube Papers – AI-powered library management and PDF reader. **Presentations & Communication** • Canva + Magic Write – For academic posters and presentations with AI assistance. • Gamma App – Turns outlines into ready-to-present decks. • ChatGPT / Claude – Can generate draft scripts, Q&A prep, or simplified explanations for talks.	13	25

5.	**Practical Aspects** • Descriptive Statistics in MS Excel • Visualization in Excel, Power BI, Tableau • Perform Advanced Analytics in SPSS / JAMOVI • Summarize a paper in NotebookLM • Prepare a Network of interconnected research paper in Connected papers.	15	CEC
	Total	**60**	**100**

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks (in %)					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
20%	30%	25%	0%	15%	10%

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

No.	Author	Title	Publisher	Edition
1	Wes McKinney	Python for Data Analysis: Data Wrangling with pandas, NumPy, and IPython	O'Reilly Media	Latest
2	Hadley Wickham & Garrett Grolemund	R for Data Science: Import, Tidy, Transform, Visualize, and Model Data	O'Reilly Media	Latest
3	Gert H. N. Laursen & Jesper Thorlund	Business Analytics Using SAS: A Practitioner's Guide	Wiley	Latest
4	Godfrey C.Onwuegbuzie & Rebecca Frels	Learning SPSS Statistics: A Guide for Data-Analysis	Routledge	Latest

(b) Open-source software and website:

1. OpenIntro Statistics (free PDF) - a good foundational statistics resource which supports analytics. (https://www.openintro.org)
2. Practical Data Science with R (free online book) - supports data-science and analytics with R.
3. UCI Machine Learning Repository + related tutorials (free) - good for analytics case studies.
4. Think Python by Allen B. Downey - a beginner-friendly Python text, open-access.

5. R: https://cran.r-project.org/
6. Jamovi: https://www.jamovi.org/
7. Excel Data Analysis ToolPak: https://support.microsoft.com/en-us/office/load-the-analysis-toolpak-in-excel-6a63e598-cd6d-42e3-9317-6b40ba1a66b4

CO- PO Mapping:

Semester-4	**Subject Name: Software Proficiency**				
	POs				
Course Outcomes	PO1	PO2	PO3	PO4	PO5
CO1	3	3	-	1	1
CO2	3	3	-	2	1
CO3	3	3	-	2	1
CO4	2	3	1	3	1
CO5	3	3	2	2	3

*Legend: '**3**' for high, '**2**' for medium, '**1**' for low and '**-**' for no correlation of each CO with PO.*

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