

## Skill Based/Specialized Laboratory (SB) Course

### Skill Based/Specialized Laboratory (SB) Course 1a: Data Analysis Using Excel

Course Title & Code	Credits	Credit Distribution of the Course			Eligibility Criteria	Prerequisite of the course (if any)
		Lecture (00 Hours)	Tutorial (00 Hours)	Practical (60 Hours)		
<b>SB 1a: Data Analysis Using Excel</b>	2	0	0	2	NIL	NIL

#### Course Objectives

- To provide students with a solid understanding of fundamental statistical concepts and practical experience in using Microsoft Excel for data analysis.
- To develop ability in students to be proficient in applying statistical techniques to interpret data and make decisions using Excel tools.

**Course Learning Outcomes:** After successful completion of this course, student will be able to:

- Grasp fundamental statistical concepts and their real world applications.
- Conduct both descriptive and inferential statistical analyses using Excel functions and tools.
- Analyze, interpret and effectively present statistical findings.

#### Unit 1 (15 Hours)

Introduction to MS Excel: Interface, functions, and statistical functions, data analysis ToolPak for statistical analysis, descriptive statistics, basic matrix operations, addition, multiplication, transpose, determinant, inverse, eigenvalues and eigenvectors, problem solving using Excel functions for sampling techniques, including simple random sampling, stratified random sampling, systematic sampling, ratio and regression estimation, cluster sampling and two-stage sampling methods.

### **Unit 2 (15 Hours)**

Hypothesis testing using Excel- z-test for single mean, difference of two means and related confidence intervals, t-test for single mean, difference of two means, paired t-test and related confidence intervals, t-test for correlation coefficient.

### **Unit 3 (15 Hours)**

Hypothesis testing using Excel- chi-square test for single variance, chi-square test for independence of attributes, chi-square test for testing goodness of fit, Bartlett's test, F-test for difference of two variances and related confidence intervals.

### **Unit 4 (15 Hours)**

Advanced problem-solving using Excel functions and the data analysis ToolPak for One and two-Way ANOVA, completely randomized design (CRD), randomized block design (RBD), Latin square design (LSD) and analysis of RBD and LSD with missing observations.

### **Essential Readings:**

1. Kronthaler, F. (2022). *Statistics Applied with Excel: Data Analysis Is (Not) an Art*. Springer
2. Kanji, G.K. (2006). *100 Statistical Tests*, SAGE Publications.
3. Montgomery, D.C. (2013). *Design and Analysis of Experiments*, John Wiley & Sons.
4. Rajagopalan, V. (2006). *Selected Statistical Tests*, New Age International Publishers, New Delhi.

### **Suggested Readings:**

1. Panneerselvam, R. (2024). *Business Statistics Using Excel: A Complete Course in Data Analytics*, Routledge.
2. Schmuller, J. (2009). *Statistical Analysis with Excel for Dummies*, Wiley.
3. Searle, S.R., & Khuri, A.I. (2017). *Matrix Algebra Useful for Statistics*, John Wiley & Sons.