

Course Code:0542-(Stat-224) Course Title: SPSS, STATA and SAS
Marks:100 Credits: 03 Number of Class: 39-42
(LAB)

Group A (SPSS); Marks 35

Rationale

This course introduces students to SPSS (Statistical Package for the Social Sciences) — one of the most widely used software for data analysis in the social sciences, business, and applied research. Students will learn how to enter, manipulate, and analyze data using SPSS commands, syntax, and its graphical user interface. Emphasis is placed on developing both conceptual and practical understanding of data management and statistical procedures.

Course Objectives

The primary objectives of this course are to enable students to:

- Understand the basic concepts, interface, and commands of SPSS.
- Learn data entry, variable definition, transformation, and file management using SPSS syntax.
- Perform descriptive and inferential statistical analysis using SPSS.
- Develop competence in interpreting SPSS output for decision-making and research.

Course Learning Outcomes (CLOs)

After completing this course, students will be able to:

CLOs	Course Learning Outcome	Cognitive Domain (Bloom's Taxonomy)
CLO1	Apply SPSS software to define variables, enter data, and execute commands for data manipulation and transformation.	Apply
CLO2	Demonstrate understanding of SPSS syntax, command structure, and data file operations.	Understand
CLO3	Perform descriptive and inferential statistical analyses (t-test, correlation, regression, ANOVA, chi-square) using SPSS.	Analyze

Mapping Between CLOs and Program Learning Outcomes (PLOs)

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CLO1	3	2	2	2	1			1
CLO2		2	3			2	2	1
CLO3	2	2	2	1	2	3	2	

Course Content, Teaching and Assessment Strategy

CLOs	Course Content	Teaching Strategy	Assessment Strategy	No. of Lectures
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CLO1	Introduction to SPSS, Meaning and Features, Concepts of Commands and Syntax Diagram, Running Commands in Interactive and Batch Modes, Sub-commands, Keywords, Values and String Values in Command Specifications, Command Order and Operation Commands.	Interactive Class, Open Discussion, Participatory Q/A Session, Online resources and Practical	Assignments, Class Tests, Presentation, Attendance and Final Examination.	6
CLO2	Data Definition and Manipulation Commands, File Management in SPSS, Reading and Writing Data, Exporting and Importing Files, Merging and Combining Datasets, Updating and Transforming Data.			8
CLO3	Statistical Analysis Commands and Procedures: Descriptive Statistics, Correlation, Regression, T-test, ANOVA, Chi-square, Non-parametric Tests, Graphical Representation, Interpretation of Output.			10

Mapping of CLOs with Teaching–Learning and Assessment Strategies

CLOs	Teaching–Learning Strategy	Assessment Strategy
CLO1	Interactive Lecture, Demonstration, Practical Exercises	Assignment, Quiz
CLO2	Collaborative Problem Solving, Hands-on Lab Work	Viva Voce, Class Test
CLO3	Case Study, Data Analysis Projects, Reflective Discussion	Lab Performance, Final Examination

Learning Resources

Textbook:

1. Nie, N.H., Bent, D.H., & Hull, C.H. (2011). *SPSS: Statistical Package for the Social Sciences*. McGraw-Hill.
2. Field, A. (2017). *Discovering Statistics Using IBM SPSS Statistics* (5th Ed.). SAGE Publications.

Additional Resources:

- IBM SPSS Documentation and Tutorials
- Online datasets for practice

Group B (STATA); Marks 35

Rationale

This course introduces STATA, a powerful statistical software used for data management, statistical analysis, and graphical representation. Students will gain hands-on experience in importing, cleaning, transforming, and analyzing data using STATA's command interface and menus. The course also covers matrix operations and solving statistical problems through programming commands, preparing students for advanced analytical and research tasks.

Objectives

- Understand the STATA interface, environment, and core commands.
- Learn how to import, clean, and manage datasets efficiently using STATA.
- Apply STATA commands for descriptive, inferential, and matrix-based statistical operations.
- Develop the ability to automate statistical analysis using STATA syntax and do-files.

Course Learning Outcomes (CLOs)

CLO Code	Course Learning Outcome	Cognitive Domain (Bloom's Taxonomy)
CLO1	Demonstrate understanding of STATA interface, windows, and data management tools for importing, exporting, and cleaning data.	Understand
CLO2	Apply STATA commands for variable manipulation, data transformation, and management of datasets.	Apply
CLO3	Perform statistical and matrix operations (vector algebra, probability distributions, equation solving) using STATA.	Analyze

Mapping Between CLOs and Program Learning Outcomes (PLOs)

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CLO1	3	2	2	2	1			1
CLO2		2	3			2	2	1
CLO3	2	2	2	1	2	3	2	

Course Content, Teaching and Assessment Strategy

CLOs	Course Content	Teaching Strategy	Assessment Strategy	No. of Lectures
CLO1	Overview of STATA; Concept of different windows (Command, Results, Variables, Review, Do-file Editor); Importing and exporting data; Converting data formats using StatTransfer; Data entry, cleaning, and storage.	Interactive Class, Open Discussion, Participatory Q/A Session, Online resources and Practical	Assignments, Class Tests, Presentation, Attendance and Final Examination.	6
CLO2	Data management: imputing, editing, creating, and changing variables; Saving, reusing, and reorganizing data; Data merging, appending, reshaping, and transformation; Use of basic STATA commands and automation with do-files.			8
CLO3	Probability distributions in STATA; Vector and matrix operations (transpose, addition, subtraction,			10

	multiplication, inversion); Solving simultaneous equations; Application to statistical models and data analysis.			
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Mapping of CLOs with Teaching–Learning and Assessment Strategies

CLOs	Teaching–Learning Strategy	Assessment Strategy
CLO1	Interactive Lecture, Demonstration, Hands-on Lab Work	Assignment, Quiz
CLO2	Problem-Solving Practice, Collaborative Learning	Viva Voce, Class Test
CLO3	Case Study, Analytical Project Work, Reflective Discussion	Lab Performance, Final Exam

Textbooks:

1. Kohler, U., & Kreuter, F. (2012). *Data Analysis Using Stata* (3rd Ed.). Stata Press.
2. Acock, A. C. (2018). *A Gentle Introduction to Stata* (6th Ed.). StataCorp LP.

Group C (SAS); Marks 30

Rationale:

This course introduce two statistical package SPSS and STATA for data analysis and programming language SAS is also introduce for reading and writing data from program.

Objectives:

The primary objective of the course is to

- Learn basic data analysis with SAS.
- Learn how to enter data, define variables, and perform variable manipulation and transformation as well as analyze the data using SAS.
- Perform Statistical Analysis Using SAS

Course Learning Outcomes:

At the end of this course students will be able to

CLO1	Apply SAS software in the following sections areas: Manipulate variables, transform data for analysis, Recode and compute variables, Describe data
CLO2	Recognize the fundamentals of selecting and executing simple statistical tests.
CLO3	Solve different statistical problems such as, Correlation, Regression, T-test, ANOVA, Chi-square, and Non-parametric alternatives using strata.

Mapping between PLOs and CLOs of Statistics program:

PLOs CLOs	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CLO1	3	2	2	2	1			1
CLO2		2	3			2	2	1
CLO3	2	2	2	1	2	3	2	

Course Content, Teaching and Assessment Strategy

CLOs	Course Content	Teaching Strategy	Assessment Strategy	No. of Lec.
CLO1	Overview, List Directed and Column Input, Pointers and Formats, Reading Structured and Unstructured Data Format List. Reading and Writing Raw and System Files, Reading and Writing Data from Program and ASCII Data from External File, File Options, Writing Data to External File, Creating and Reading Permanent SAS Data Set, Working with Large Data Sets Problems.	Interactive Class, Open Discussion, Participatory Q/A Session, Online resources and Practical	Assignments, Class Tests, Presentation, Attendance and Final Examination.	7
CLO2	Reading Data from Different Formatted Data Files, Converting Different Database Formatted Files to SAS System Files. Data Set Sub-setting, Concatenating, Merging and Updating Sub-setting, Combining Different Data from Multiple Files, Table Look Up, and Updating Master File form Update File.			8
CLO3	Use of Array for Missing Values to Create New Variables, Transformation of Data Set, Temporary Arrays, Multidimensional Arrays. Use Sas Syntax for graphical representation, interlocutory statistics and bivariate statistics.			9

Mapping of Course Learning Outcomes (CLOs) with the Teaching – Learning & Assessment Strategy

CLOs	Teaching-Learning Strategy	Assessment Strategy
CLO1	Classroom Discussion and interactive learning	Lab Assessment

CLO2	Problem-solving activities and Collaborative learning spaces	Viva-Voce
CLO3	Lecture, Current events quizzes, and Reflective Discussion	Lab Performance (Summative Examination)

Text Book

1. Delwiche, L. D. and S. J. Slaughter (2003):The Little SAS Book: SAS Institute Inc., Cary, NC, USA