



BHARATHIDASANUNIVERSITY, TIRUCHIRAPPALLI – 620024

**ALLIED STATISTICS
(for B.Sc. Geography Programme)**

(Applicable to the candidates admitted from the academic year 2026-27 onwards)

Year: First

ALLIED COURSE 1

Semester: I

Code :

**STATISTICS – I
(Theory)**

Credits: 4

COURSE OBJECTIVES:

- To learn the statistical foundations for data science / geography
- To learn how to implement various statistical procedure
- To explain how statistical methods used in data science / geography

Unit I:

Introduction to Statistics: Introduction - The Nature of Statistics - Data Collection - Inferential Statistics and Probability Models- Populations and Samples - Stratified Random Sampling.

Unit II:

Describing Data Sets: Introduction - Frequency tables and graphs - Grouped Data and Histograms - Stem and Leaf plots - Sets of paired Data.

Unit III:

Using Statistics to Summarize the Data Sets: Introduction - Sample mean - Sample median - Sample mode - Sample variance and sample standard deviation - Normal data sets and empirical rules - Sample correlation coefficient.

Unit IV:

Discrete Random Variables: Introduction - Random Variables - Expected Value - Variance of Random Variables - Binomial Random Variables - Hypergeometric Random Variables - Poisson Random Variables.

Unit V:

Normal Random Variables - Continuous Random Variables - Probabilities Associated with a Standard Normal Random Variable - Finding Normal Probabilities - Conversion to the Standard Normal - Additive Property of Normal Random Variables- Percentiles of Normal Random Variables.

Unit VI: Current Contours (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned.

REFERENCES:

1. Sheldon M. Ross, "Introductory Statistics", Academic Press of Elsevier, 4th Edition

2017. (Chapter 1 - 6).
2. Deborah J. Rumsey, "Statistics II for Dummies", Wiley, 2021.
3. Allen B. Downey, "Think Stats Probability and Statistics for Programmers", Green Tea Press, 2011.
4. Peter Bruce and Andrew Bruce, "Practical Statistics for Data Scientists", O'Reilly Media, Inc., 2017.

COURSE OUTCOMES:

On the successful completion of the course, students will be able to,

C01: Describe the fundamentals of data sets.

C02: Identify and apply the concepts of basic statistics

C03: Apply data analytics for real world problems

C04: Explore discrete random variables.

C05: Implement continuous random variables.

Course Outcomes	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10
C01	1	3	2	3	1	1	1	3	1	2
C02	1	3	3	3	2	1	1	3	2	2
C03	1	3	3	3	2	1	2	3	2	2
C04	1	3	3	3	2	1	2	3	2	2
C05	1	3	3	3	2	1	2	3	2	3

COURSE OBJECTIVES:

- To learn practical training in SPSS
 - To demonstrate statistics using SPSS
 - To analyze various problems using SPSS
1. Find Mean, Median and Mode using SPSS.
 2. Calculate Standard deviation and variance using SPSS.
 3. Demonstrate Bar diagram in SPSS.
 4. Construct Line diagram in SPSS.
 5. Demonstrate Pie chart in SPSS
 6. Construct Histograms in SPSS.
 7. Explore t-test for one sample problem.
 8. Analyze t-test for two sample problems.
 9. Demonstrate t-test for testing the significance of Correlation Coefficient in SPSS.
 10. Implement the analysis of variance using SPSS.
 11. Read Data from Database using SPSS.
 12. Demonstrate how to handle Missing data in SPSS.
 13. Show Summary Measures for Categorical Data in SPSS.
 14. Construct Charts for Categorical Data in SPSS
 15. Construct Pivot tables in SPSS.
 16. Find the Coefficient of correlation using SPSS.
 17. Find the Regression equation of X on Y.
 18. Formulate the Regression equation of Y on X.
 19. Apply One-tailed Test with an example using SPSS.
 20. Implement Two-tailed test with a sample problem in SPSS.

COURSE OUTCOMES:

On the successful completion of the course, students will be able to,

CO1: Relate the use of SPSS to analyze the problems

CO2: Create charts and plots in SPSS

CO3: Understand the concept of T-test

CO4: Understand the usage of analysis of variance using SPSS

CO5: Analyze problems related to standard deviation

Course Outcomes	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10
CO1	1	3	2	3	1	1	1	3	1	2
CO2	1	3	3	3	2	1	1	3	2	2
CO3	1	3	3	3	2	1	2	3	2	2
CO4	1	3	3	3	2	1	2	3	2	2
CO5	1	3	3	3	2	1	2	3	2	3

Year: First

ALLIED COURSE 2

Semester: II

Code :

**STATISTICS – II
(Theory)**

Credits: 4

COURSE OBJECTIVES:

- To learn the statistical foundations for data science.
- To learn how to implement various statistical techniques.
- To explain how statistical methods used in data science.

UNIT – I:

Distributions of Sampling - Sample Mean - Central Limit - Sampling Proportions from a Finite Population - Distribution of the Sample Variance of a Normal Population Testing Statistical Hypotheses - Hypothesis Tests and Significance Levels - Tests Concerning the Mean of a Normal Population: Case of Known Variance - The t Test for the Mean of a Normal Population: Case of Unknown Variance- Hypothesis Tests Concerning Population Proportions

UNIT – II:

Hypothesis Tests Concerning Two Populations - Testing Equality of Means of Two Normal Populations: Case of Known Variances - Testing Equality of Means: Unknown Variances and Large Sample Sizes - Testing Equality of Means: Small-Sample Tests when the Unknown Population Variances are Equal Paired-Sample t Test - Testing Equality of Population.

UNIT - III:

Analysis of Variance - One-Factor Analysis of Variance - A Remark on the Degrees of Freedom - Two-Factor Analysis of Variance: Introduction and Parameter Estimation - Two-Factor Analysis of Variance - Testing Hypotheses.

UNIT - IV:

Linear Regression: Simple Linear Regression Model - Estimating the Regression Parameters - Error Random Variable Testing - Regression to the Mean - Prediction Intervals for Future Responses - Coefficient of Determination - Sample Correlation Coefficient - Analysis of Residuals - Assessing the Model - Multiple Linear Regression Model.

UNIT - V:

Chi-Squared Goodness-of-Fit Tests: Chi-Squared Goodness-of-Fit - Testing for Independence in Populations Classified According to Two Characteristics - Testing for Independence in Contingency Tables with Fixed Marginal Totals - Non-parametric Hypotheses - Sign test – Signed Rank test.

Unit VI: Current Contours (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned.

REFERENCES:

1. Sheldon M. Ross, “Introductory Statistics”, Academic Press of Elsevier, 4th Edition 2017. (Chapter 7 - 14).

2. Deborah J. Rumsey, "Statistics II for Dummies", Wiley, 2021.
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COURSE OUTCOMES:

On the successful completion of the course, students will be able to,

CO1: Understand sampling distributions and hypothesis testing.

CO2: Apply statistical tests for one and two populations.

CO3: Analyze data using one-way and two-way ANOVA.

CO4: Develop and interpret simple and multiple regression models.

CO5: Apply chi-square and nonparametric tests for data analysis.

Course Outcomes	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10
CO1	1	3	2	3	1	1	1	3	1	2
CO2	1	3	3	3	2	1	1	3	2	2
CO3	1	3	3	3	2	1	2	3	2	2
CO4	1	3	3	3	2	1	2	3	2	2
CO5	1	3	3	3	2	1	2	3	2	3



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**ALLIED STATISTICS
(for B.Sc. Data Science Programme)**

(Applicable to the candidates admitted from the academic year 2026-27 onwards)

Year: Second

ALLIED COURSE 3

Semester: III

Code :

**STATISTICS – I
(Theory)**

Credits: 4

COURSE OBJECTIVES:

- To learn the statistical foundations for data science / geography
- To learn how to implement various statistical procedure
- To explain how statistical methods used in data science / geography

Unit I:

Introduction to Statistics: Introduction - The Nature of Statistics - Data Collection - Inferential Statistics and Probability Models- Populations and Samples - Stratified Random Sampling.

Unit II:

Describing Data Sets: Introduction - Frequency tables and graphs - Grouped Data and Histograms - Stem and Leaf plots - Sets of paired Data.

Unit III:

Using Statistics to Summarize the Data Sets: Introduction - Sample mean - Sample median - Sample mode - Sample variance and sample standard deviation - Normal data sets and empirical rules - Sample correlation coefficient.

Unit IV:

Discrete Random Variables: Introduction - Random Variables - Expected Value - Variance of Random Variables - Binomial Random Variables - Hypergeometric Random Variables - Poisson Random Variables.

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CO4: Explore discrete random variables.

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Course Outcomes	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10
CO1	1	3	2	3	1	1	1	3	1	2
CO2	1	3	3	3	2	1	1	3	2	2
CO3	1	3	3	3	2	1	2	3	2	2
CO4	1	3	3	3	2	1	2	3	2	2
CO5	1	3	3	3	2	1	2	3	2	3

Code :

**STATISTICS FOR DATA SCIENCE
(Practical)**

Credits: 4

COURSE OBJECTIVES:

- To learn practical training in SPSS
 - To demonstrate statistics using SPSS
 - To analyze various problems using SPSS
1. Find Mean, Median and Mode using SPSS.
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CO2	1	3	3	3	2	1	1	3	2	2
CO3	1	3	3	3	2	1	2	3	2	2
CO4	1	3	3	3	2	1	2	3	2	2
CO5	1	3	3	3	2	1	2	3	2	3

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Unit - VI: Current Contours (for Continuous Internal Assessment Only):

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CO2	1	3	3	3	2	1	1	3	2	2
CO3	1	3	3	3	2	1	2	3	2	2
CO4	1	3	3	3	2	1	2	3	2	2
CO5	1	3	3	3	2	1	2	3	2	3