

**G U J A R A T   U N I V E R S I T Y**  
**U.G. B.A (HONS.)**  
**SEMESTER – IV**  
**APPLIED STATISTICS**  
**COURSE CODE: DSC M STA 244**  
**CREDIT MARK DISTRIBUTION – 04**  
**AS PER NEP 2020      (To be effective from June 2024)**

**Lecture 04 Hours**

**Tutorial – 00**

**Practicum – 00**

**COURSE OBJECTIVES**

- The course objective is to empower students with the ability of understand, analyze and interpret data critically. By the end of the course, students should be equipped to conduct basic statistical analyses and apply statistical reasoning to business related data.
- This helps students to become familiar with the basics of Probability Theory.

**PRE – REQUISITE & CO- REQUISITE**

Students must know basic concepts of mathematics and basic concepts of Statistics.

**COURSE OUTCOMES**

- The Course Outcomes for an Applied Statistics course, covering Time Series Analysis, Index Number, Permutation and Combination and Probability are designed to provide students with practical skills for data analysis, forecasting, and probability.
- In Time Series Analysis, students will learn to identify and analyze patterns such as trends, seasonality and cycles within time-dependent data.
- In Probability students helps to measure uncertainty or randomness in the occurrence of any event and to use it for the problems of real life problems.
- By the end of the course, students will be equipped to analyze data, to forecast business needs, empowering them to make informed about data-driven decisions and contribute to continuous improvement in various areas such as industrial, business and economics.
- Permutations and Combinations will take the logical and mathematical understanding of students to the next level.

UNIT	CONTENT	WEIGHTAGE
1	<p><b>TIME SERIES ANALYSIS</b></p> <ul style="list-style-type: none"> <li>➤ Meaning and uses of Time Series</li> <li>➤ Meaning of Analysis of Time Series</li> <li>➤ Components of Time Series <ul style="list-style-type: none"> <li>● Secular Trend</li> <li>● Seasonal Variations</li> <li>● Cyclical Variations</li> <li>● Irregular Variations</li> </ul> </li> <li>➤ Methods for Finding Trend <ul style="list-style-type: none"> <li>● Graphical Method</li> <li>● Moving Average Method with Examples</li> <li>● Method for Finding Seasonal Indices with Example</li> </ul> </li> </ul> <p>Note:</p> <p>1 All topics are using Additive Model Only</p> <p>2 All the graphs in this unit can be provided for illustrative purposes only and will <b>not be included in the examination.</b></p>	25%
2	<p><b>INDEX NUMBERS</b></p> <ul style="list-style-type: none"> <li>➤ Meaning of Index Numbers</li> <li>➤ Characteristics of Index Numbers</li> <li>➤ Uses of Index Numbers</li> <li>➤ Types of Index Numbers</li> <li>➤ Limitation of Index Numbers</li> <li>➤ Selection of Base Year – Fixed Base, Chain Base</li> <li>➤ Construction of Wholesale Price Index Number</li> <li>➤ Formulae of Finding Index Number: <ul style="list-style-type: none"> <li>❖ Laspeyer’s Index Number</li> <li>❖ Paasche’s Index Number</li> <li>❖ Fisher’s Index Number</li> </ul> </li> <li>➤ Time Reversal and Factor Reversal Tests (Only Theory)</li> <li>➤ Simple Examples</li> </ul>	25%
3	<p><b>PERMUTATION AND COMBINATION</b></p> <ul style="list-style-type: none"> <li>➤ Basic Idea of Permutation</li> <li>➤ <math>nPr</math> Formula without proof</li> <li>➤ Basic Idea of Combination</li> <li>➤ <math>nCr</math> Formula without proof</li> <li>➤ Simple Examples</li> </ul>	25%

<b>4</b>	<p><b>PROBABILITY</b></p> <ul style="list-style-type: none"> <li>➤ Definition of Random Experiment, Sample Space, Events, Union and Intersection of Events, Complementary Events, Mutually Exclusive Events, Exhaustive Events, Independent Events, Equally Likely Events.</li> <li>➤ Mathematical and Statistical definitions of Probability.</li> <li>➤ Theorems of Addition and Multiplication laws of Probability (Without Proof).</li> <li>➤ Conditional Probability</li> <li>➤ Simple Examples of Probability</li> </ul>	<b>25%</b>
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### MODE OF EVALUATION

Evaluation will be divided in two parts:

- **Semester End Evaluation (SEE):** Semester End Examination will be conducted by the Gujarat University of 50 Marks
- **Continuous and Comprehensive Evaluation (CCE):** Continuous and Comprehensive Evaluation of 50 marks will be decided by the colleges / Institutes/ University departments as per the instruction given by the University time to time

### FBLD (Flip Blended Learning Design Template)

- Any One Unit from the above syllabus can be discussed by the faculty through online mode.
- Online mode can be SWAYAM MOOC Course or any other suggested by the UGC or Gujarat University.

## REFERENCE BOOKS:

1. "Statistics for Business and Economics"  
Author: Paul Newbold, William L. Carroll, Betty Thorne  
Publisher: Pearson Education
2. "Industrial Statistics: A Handbook for Practitioners"  
Author: R. K. Gupta, D. S. Hira  
Publisher: S. Chand & Co. (Indian Edition)
3. "Time Series Analysis and Forecasting: A Practical Guide for Scientists and Engineers"  
Author: A. S. Bovas Abraham, Johannes Ledolter  
Publisher: Elsevier Science
4. "Business Statistics"  
Author: Sancheti & Kapoor  
Publisher: Sultan Chand & Sons, New Delhi".
5. "Business Mathematics"  
Author: Sancheti & Kapoor  
Publisher: Sultan Chand & Sons, New Delhi".
6. "Fundamental of Mathematical Statistics"  
Author: S. C. Gupta  
Publisher: Sultan Chand & Sons, New Delhi."
7. "Introduction to Time Series Analysis and Forecasting"  
Author: Douglas C. Montgomery, Cheryl L. Jennings, M. Pamela McRae  
Publisher: Wiley
8. "Industrial Engineering and Management"  
Author: O. P. Khanna  
Publisher: Dhanpat Rai Publications (Indian Edition)
9. "Fundamentals of Applied Statistics"  
Author: S. C. Gupta, V. K. Kapoor  
Publisher: Sultan Chand & Sons (Indian Edition)
10. "Statistics for Management"  
Author: Richard I. Levin, David S. Rubin  
Publisher: Pearson Education