

**B. COM. (HONS)**  
**SEMESTER – IV (MAJOR)**  
**THEORY OF SAMPLING**  
**COURSE CODE – DSC C STA 241**  
**CREDIT MARK DISTRIBUTION – 04**  
**AS PER NEP 2020 (To be effective from June 2024)**

**Lecture 04 Hours**

**Tutorial – 00**

**Practical – 00**

**COURSE OBJECTIVES**

A course on Sampling in technique is designed to introduce students to the principles and methods of sampling in the context of conducting research studies. Sampling is a critical aspect of research, as it involves selecting a subset of individuals or items from a larger population to make inferences about the entire population. The course aims to equip students with the necessary knowledge and skills to design and conduct sampling procedures effectively. Throughout the course, students may engage in practical exercises, case studies, and simulations to apply sampling methods and gain hands-on experience in selecting samples for different research scenarios. By the end of the course, students should be able to make informed decisions about selecting appropriate sampling methods for their research studies and understand the implications of sampling choices on the validity and generalizability of research findings.

**PRE – REQUISITE**

A foundational understanding of basic mathematics is essential for sampling in technique. Students should be familiar with arithmetic, algebra, and basic statistical concepts. Familiarity with introductory research methods or statistics is beneficial.

Students should have a basic understanding of research design, data collection, and descriptive statistics. Basic knowledge of probability concepts is helpful, especially for understanding probability sampling methods used in research. Strong critical thinking skills are essential for understanding the implications of sampling choices and evaluating the validity of research studies.

### **COURSE OUTCOMES**

Completing a course on Sampling in technique should empower students with the knowledge and skills necessary to make sound sampling decisions in research studies, ensuring that the collected data accurately represent the population of interest and enable valid inferences and generalizations.

<b>UNIT</b>	<b>CONTENT</b>	<b>WEIGHTAGE</b>
<b>1</b>	<p><b>SAMPLING METHODS</b></p> <ul style="list-style-type: none"> <li>☒ Meaning of Population and Sample</li> <li>☒ Definition of Population Study and Sample Study</li> <li>☒ Difference between Population Study and Sample Study</li> <li>☒ Definition of Sampling and its requirement</li> <li>☒ Characteristics of Good Sample</li> <li>☒ Size of sample</li> <li>☒ Advantages of Enumeration</li> <li>☒ Limitation of sampling</li> <li>☒ Sampling with replacement and without replacement</li> <li>☒ Theoretical Description of Different Sampling Methods</li> </ul> <p><b>Non probabilistic sampling methods</b></p> <ul style="list-style-type: none"> <li>☒ Convenience Sampling</li> <li>☒ Purposive/ Judgmental Sampling</li> <li>☒ Snowball Sampling</li> <li>☒ Quota Sampling</li> </ul>	<b>25%</b>

	<p><b>Probabilistic Sampling</b></p> <ul style="list-style-type: none"> <li>☒ Simple Random Sampling</li> <li>☒ Systematic Sampling</li> <li>☒ Stratified Sampling</li> <li>☒ Cluster Sampling</li> <li>☒ Multi-Stage Sampling</li> <li>☒ Framing of sample survey</li> </ul>	
<b>2</b>	<p><b>SIMPLE RANDOM SAMPLING AND TECHNIQUES</b></p> <ul style="list-style-type: none"> <li>☒ Meaning of Simple Random Sampling (SRS)</li> <li>☒ Notations Used for SRS</li> <li>☒ Verification of various results</li> <li>☒ Mean of sample mean is an unbiased estimator for population mean</li> <li>☒ Verification for variance of sample mean</li> <li>☒ Sample variance is an unbiased estimator for population variance. For simple random sampling (For with replacement and without replacement)</li> <li>☒ Application on Verification of Results based on SRS</li> </ul>	<b>25%</b>
<b>3</b>	<p><b>STRATIFIED SAMPLING TECHNIQUES</b></p> <ul style="list-style-type: none"> <li>☒ Introduction to Stratified Sampling</li> <li>☒ Simple numerical examples for stratified random sample to verify the result</li> <li>☒ Stratified random sample mean is an unbiased estimator for</li> </ul>	<b>25%</b>

	<p>population mean</p> <ul style="list-style-type: none"> <li>☒ Calculation of the variance of stratified sample mean</li> </ul>	
<b>4</b>	<p><b>SYSTEMATIC SAMPLING AND CLUSTER SAMPLING TECHNIQUES</b></p> <ul style="list-style-type: none"> <li>☒ Introduction to Systematic Sampling</li> <li>☒ Simple numerical examples for systematic sample to verify the result</li> <li>☒ Systematic random sample mean is an unbiased estimator for population mean and calculation of the variance of systematic sample mean.</li> <li>☒ Introduction to Cluster Sampling</li> <li>☒ Simple numerical examples for estimated sample mean and sample variance.</li> </ul>	<b>25%</b>

### **MODE OF EVALUATION**

Evaluation will be divided in two parts.

- ☒ **External:** Semester end Examination will be conducted by the Gujarat University of  
50 Marks
- ☒ **Internal:** Internal 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. "Sampling Theory and Methods" by M. Narasimha Murty (published by New Age International Publishers)
2. "Sampling Techniques" by William G. Cochran (translated by A. S. Inamdar and S. S. Salunkhe, published by Technical Publications Pune)
3. "Applied Sampling" by S. K. Haldar and A. Maiti (published by World Scientific Publishing Company)
4. "Sampling Techniques" by P. K. Jha and Pradeep K. Sahu (published by PHI Learning Private Limited).
5. " Fundamentals of Applied Statistics" by S. C. Gupta and V. K. Kapoor (published by Sultan Chand @sons).
6. "Sampling: Design and Analysis" by Sharon L. Lohr (published by CRC Press)

**B. COM. (HONS)**  
**SEMESTER –IV (MAJOR)**  
**OPTIMIZATION TECHNIQUE -I**  
**COURSE CODE – DSC C STA 242**  
**CREDIT MARK DISTRIBUTION – 04**

**COURSE OBJECTIVES**

- The course aims at building capabilities in the students for analyzing different situations in the industrial/ business scenario involving limited resources and finding the best feasible solution (Optimum Solution) within constraints.
- The objective of this course is to enable the student to understand and analyze managerial problems to equip him/ her to use the resources such as capitals, materials, production controlling, directing, staffing, and machines more effectively.
- **PRE – REQUISITE**
- The world of Operations Research is dynamic and fast paced. It is also the blending of mathematics, optimization, statistics, and computer science, techniques to improve decision making, processes and systems. The learners should have knowledge of mathematics up to higher school level to learn basic contents of Operations Research.
- **CO – REQUISITE**
- The learner should have basic understanding of mathematics, management and economic concepts.

**COURSE OUTCOMES**

- Understanding the basic concept and working of O.R. to solve the Industrial/ Organizational problem in optimum manner.
- Solve linear programming problems using appropriate technique and interpret the results obtained.
- Solving linear programming problem with multiple variables and finding optimal outcomes.
- Enabling to take decisions under uncertain scenario of business.

UNIT	CONTENT	WEIGHTAGE
1	<p><b>INTRODUCTION TO OPERATIONS RESEARCH</b></p> <ul style="list-style-type: none"> <li>➤ Origin of OR</li> <li>➤ Definitions of Operations Research (OR)</li> <li>➤ Nature and Scope of OR</li> <li>➤ Characteristics of OR</li> <li>➤ Phases of OR</li> <li>➤ Limitations of OR</li> <li>➤ Different types of Models in OR</li> <li>➤ Applications of OR in the fields of Marketing, Financial Planning</li> <li>➤ Different Techniques of OR</li> </ul>	25%
2	<p><b>LINEAR PROGRAMMING PROBLEM (LPP-GRAPHICAL METHODS)</b></p> <ul style="list-style-type: none"> <li>➤ Meaning of Linear Programming Problems (LPP)</li> <li>➤ Advantages / Uses, Assumptions and Limitations of LPP</li> <li>➤ Understanding of Terms used in LPP</li> <li>➤ Mathematical form of LPP</li> <li>➤ Conversion of practical problem into mathematical form.</li> <li>➤ Solution of LP problem for two variables only by graphical method</li> </ul>	25%
3	<p><b>LINEAR PROGRAMMING PROBLEM (LPP-SIMPLEX METHOD-I)</b></p> <ul style="list-style-type: none"> <li>➤ Definition of Slack, Surplus and Artificial variable.</li> <li>➤ Concept of Basic solution, Basic feasible solution, Initial basic feasible solution</li> <li>➤ Standard form of LPP and introduction to Simplex method</li> <li>➤ Simplex algorithm for solving LPP</li> <li>➤ Simple Simplex algorithm (problems with constraints "<math>\leq</math>" and "<math>=</math>" types only)</li> </ul>	25%
4	<p><b>DECISION THEORY</b></p> <ul style="list-style-type: none"> <li>➤ Meaning and importance of decision theory</li> <li>➤ Components of decision theory</li> <li>➤ Different methods of taking decision</li> <li>➤ Maxi-Min principle, Maxi-Max principle, Laplace's principle, Hurwitz's principle</li> <li>➤ Expected Monetary value (EMV)</li> <li>➤ EPPI and EVPI and sums related to above all</li> </ul>	25%

## **MODE OF EVALUATION**

Evaluation will be divided in two parts.

- **External:** Semester end Examination will be conducted by the Gujarat University of 50 Marks
- **Internal:** Internal 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. Operation Research - Kanti Swaroop
2. Operation Research : P. K. Gupta and Man Mohan
3. Operation Research : Dr R. V. S. Prasad
4. Operation Research : Dr. D. Giri
5. Operation Reach – S. D. Sharma and J. K. Sharma
6. Operations research - Models and methods by Chandrasekar Salimath, Bhupendar Parashar.
7. Operations Research – Taha
8. Operations Research – N. D. Vora

# **GUJARAT UNIVERSITY**

**U.G. B.A/B.COM (HONS.)**

**SEMESTER – IV**

**STATISTICAL QUALITY CONTROL**

**COURSE CODE: DSC C STA 243**

**CREDIT MARK DISTRIBUTION – 04**

**AS PER NEP 2020 (To be effective from June 2024)**

**Lecture 04Hours**

**Tutorial – 00**

**Practicum – 00**

## **COURSE OBJECTIVES**

- To equip students with the knowledge and skills to apply statistical techniques for ensuring consistency in quality through various statistical tools, enabling informed decision-making in business and industrial contexts.
- To enhance students' ability to design and implement quality control systems using advanced statistical methods, helping them optimize operational efficiency, improve product quality, and balance inspection costs with quality requirements in production and business processes.

## **PRE – REQUISITE**

The pre-requisites for Statistical Quality Control—include a solid foundation in Probability and Statistics for understanding statistical models and quality assessment methods. An understanding of Industrial Engineering or Manufacturing Processes is beneficial for Process Control Techniques and Product Control Techniques, as these topics focus on quality control and sampling methods within production and manufacturing contexts. Together, these pre-requisites provide the foundational knowledge needed to effectively control quality in data-driven and industrial settings.

## **CO – REQUISITE**

The co-requisites Statistical Quality Control— include concepts of Process Control Techniques and Product Control Techniques, Quality Management Systems are important to understand quality frameworks, while Data Analytics for Process Improvement supports the analysis of process performance and enhancement of quality control. Together, these co-requisites enable students to apply theoretical knowledge practically, ensuring robust quality management skills across business and industrial applications.

## **COURSE OUTCOMES**

The Course Outcomes for a Statistical Quality Control course, covering Process Control Techniques, Acceptance Sampling and Quality Assurance are designed to provide students with practical skills for data analysis, forecasting, and quality management in business and industrial contexts. In Process Control Techniques (Statistical Quality Control), students will become proficient in using statistical tools such as control charts (e.g., X-bar, R, p-charts) to monitor and maintain process stability and apply corrective actions to ensure consistent quality in production. In Acceptance Sampling, students will develop the ability to design and implement single and double sampling plans for assessing product quality, analyze Operating Characteristic (OC) curves to measure sampling effectiveness, and balance inspection costs with quality standards for optimal resource allocation. Finally, in Quality Assurance, students will learn the concept of Total Quality Management, Just In Time,

Quality circles and ABC analysis. By the end of the course, students will be equipped to apply quality control techniques, empowering them to make informed, data-driven decisions and contribute to continuous improvement in various industrial and business environments.

UNIT	CONTENT	WEIGHTAGE
1	<p><b>PROCESS CONTROL TECHNIQUES</b></p> <ul style="list-style-type: none"> <li>□ Meaning of Quality and Quality Control</li> <li>□ Uses of Quality Control in Industry</li> <li>□ Variation in Quality and Causes of Variation</li> <li>□ Principle of Control Charts</li> <li>□ Process Control Limits</li> <li>□ Revised Control Limits</li> <li>□ Theory of Runs</li> <li>□ Chart of Variables with Examples [Chart of Average (X Chart) and Chart of Range (R - Chart)]</li> <li>□ Chart of Attributes with Examples for Constant Sample Size [Chart of fraction defective (p - chart), Chart of Number of</li> </ul>	25%

	<p>Defective Items (np-chart), Chart of per Unit Defects (C- Chart)]</p> <ul style="list-style-type: none"> <li>□ Difference between Chart of Variables and Chart of Attributes</li> </ul>	
<b>2</b>	<p><b>PRODUCT CONTROL TECHNIQUE 1 – Single Sampling Plan</b></p> <ul style="list-style-type: none"> <li>□ Meaning of Product Control Techniques</li> <li>□ Meaning of Single Sampling Plan (SSP)</li> <li>□ Acceptable Quality Level (AQL)</li> <li>□ Lot Tolerance Proportion Defective (LTPD)</li> <li>□ Producer’ s Risk and Consumer’ s Risk</li> <li>□ Operating Characteristic Curve (OC Curve)</li> <li>□ Average Sample Number (ASN)</li> <li>□ Average Total Inspection (ATI)</li> <li>□ Average Outgoing Quality (AOQ)</li> <li>□ Simple Examples based on Hypergeometric and Poisson Distribution only</li> </ul>	<b>25%</b>
<b>3</b>	<p><b>PRODUCT CONTROL TECHNIQUE 2 – Double Sampling Plan</b></p> <ul style="list-style-type: none"> <li>□ Meaning of Double Sampling Plan (DSP)</li> <li>□ Procedure of Double Sampling Plan</li> <li>□ Operating Characteristic Curve (OC Curve)</li> <li>□ Average Sample Number (ASN)</li> <li>□ Average Total Inspection (ATI)</li> <li>□ Average Outgoing Quality (AOQ)</li> <li>□ Difference between SSP &amp; DSP</li> <li>□ Simple Examples based on Poisson Distribution only</li> </ul>	<b>25%</b>
<b>4</b>	<b>Quality Assurance</b>	<b>25%</b>

	<ul style="list-style-type: none"> <li>□ Total Quality Management (TQM)</li> <li>□ Just In Time (JIT)</li> <li>□ Quality Circles</li> <li>□ ABC analysis</li> </ul>	
--	---	--

## 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:

- |   |  |
|---|--|
| <p>1. "Industrial Statistics: A Handbook for Practitioners"<br/>Author: R. K. Gupta, D. S. Hira</p> | <p>4. "Statistical Quality Control"<br/>Author: M. Mahajan<br/>Publisher: Dhanpat Rai &amp; Sons (Indian</p> |
|---|--|

- Publisher: S. Chand & Co. (Indian Edition)
2. "Quality Control and Industrial Statistics"  
Author: A. C. Montgomery  
Publisher: Wiley
  3. "Statistical Methods for Quality Control"  
Author: G. K. Gupta  
Publisher: Tata McGraw-Hill Education (Indian Edition)
  5. "Industrial Engineering and Management"  
Author: O. P. Khanna  
Publisher: Dhanpat Rai Publications (Indian Edition)
  6. "Statistics for Management"  
Author: Richard I. Levin, David S. Rubin  
Publisher: Pearson Education
  7. "Process Quality Control: Troubleshooting and Interpretation of Data"  
Author: J. D. Sokol  
Publisher: Wiley

**G U J A R A T   U N I V E R S I T Y**  
**U.G. B.COM (HONS.)**  
**SEMESTER – IV**  
**INDUSTRIAL 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**

- To equip students with the knowledge and skills to apply statistical techniques for analyzing data, predicting trends, and ensuring consistency in quality through various statistical tools, enabling informed decision-making in business and industrial contexts.
- To enhance students' ability to design and implement quality control systems using advanced statistical methods, helping them optimize operational efficiency, improve product quality, and balance inspection costs with quality requirements in production and business processes.

**PRE – REQUISITE**

The pre-requisites for Industrial Statistics—include a solid foundation in Probability and Statistics for understanding statistical models and quality assessment methods. Calculus is also necessary to grasp the mathematical foundations of model derivations in time series and forecasting. For Business Forecasting, familiarity with Basic Economics is essential to contextualize forecasting techniques within economic and business environments. Additionally, an understanding of Industrial Engineering or Manufacturing Processes is beneficial for Process Control Techniques and Product Control Techniques, as these topics focus on quality control and sampling methods within production and manufacturing contexts. Together, these pre-requisites provide the foundational knowledge needed to effectively analyze, forecast, and control quality in data-driven and industrial settings.

## **CO – REQUISITE**

The co-requisites Industrial Statistics—including Regression Analysis for model building and prediction, which is fundamental to time series and forecasting. For Business Forecasting, Business Analytics provides complementary skills to interpret and act on forecasts effectively. In the areas of Process Control Techniques and Product Control Techniques, Quality Management Systems are important to understand quality frameworks, while Data Analytics for Process Improvement supports the analysis of process performance and enhancement of quality control. Together, these co-requisites enable students to apply theoretical knowledge practically, ensuring robust data analysis, forecasting, and quality management skills across business and industrial applications.

## **COURSE OUTCOMES**

The Course Outcomes for an Industrial Statistics course, covering Time Series Analysis, Business Forecasting, Process Control Techniques (Statistical Quality Control), and Product Control Techniques (Acceptance Sampling), are designed to provide students with practical skills for data analysis, forecasting, and quality management in business and industrial contexts. In Time Series Analysis, students will learn to identify and analyze patterns such as trends, seasonality, and cycles within time-dependent data. In Business Forecasting, students will be able to implement various forecasting methods like moving averages, exponential smoothing, and regression analysis to predict business trends, evaluate forecast accuracy, and refine models based on data feedback, aiding strategic planning and decision-making. In Process Control Techniques (Statistical Quality Control), students will become proficient in using statistical tools such as control charts (e.g., X-bar, R, p-charts) to monitor and maintain process stability and apply corrective actions to ensure consistent quality in production. Finally, in Product Control Techniques (Acceptance Sampling), students will develop the ability to design and implement single, double, and multiple sampling plans for assessing product quality, analyze Operating Characteristic (OC) curves to measure sampling effectiveness, and balance inspection costs with quality standards for optimal resource allocation. By the end of the course, students will be equipped to analyze data, forecast business needs, and apply quality control techniques, empowering them to make informed, data-driven decisions and contribute to continuous improvement in various industrial and business environments.

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 Variations 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>BUSINESS FORECASTING</b></p> <ul style="list-style-type: none"> <li>➤ Meaning and Importance of Business Forecasting</li> <li>➤ Statistical methods for Forecasting (Brief explanation of Various methods. Such as Time Series, Index Number, Regression, Extrapolation, Economic Models, Opinion Poll etc.)</li> <li>➤ Method of Least Squares with Examples <ul style="list-style-type: none"> <li>● For Linear Trend</li> <li>● For Second Degree Parabolic Trend</li> </ul> </li> <li>➤ Method of Exponential Smoothing with Examples</li> </ul>	25%
3	<p><b>PROCESS CONTROL TECHNIQUES (STATISTICAL QUALITY CONTROL)</b></p> <ul style="list-style-type: none"> <li>➤ Meaning of Quality and Quality Control</li> <li>➤ Uses of Quality Control in Industry</li> <li>➤ Variation in Quality and Causes of Variation</li> <li>➤ Principle of Control Charts</li> <li>➤ Process Control Limits</li> <li>➤ Revised Control Limits</li> <li>➤ Theory of Runs</li> <li>➤ Chart of Variables with Examples [Chart of Average (<math>\bar{X}</math> – Chart) and Chart of Range (R - Chart)]</li> <li>➤ Chart of Attributes with Examples for Constant Sample Size [Chart of fraction defective (p – chart), Chart of Number of Defective Items (np-chart), Chart of per Unit Defects (C- Chart)]</li> <li>➤ Difference between Chart of Variables and Chart of Attributes</li> </ul>	25%

<b>4</b>	<p><b>PRODUCT CONTROL TECHNIQUES (ACCEPTANCE SAMPLING)</b></p> <ul style="list-style-type: none"> <li>➤ Meaning of Product Control Techniques</li> <li>➤ Meaning of Single Sampling Plan (SSP)</li> <li>➤ Acceptable Quality Level (AQL)</li> <li>➤ Lot Tolerance Proportion Defective (LTPD)</li> <li>➤ Producer's Risk and Consumer's Risk</li> <li>➤ Operating Characteristic Curve (OC Curve)</li> <li>➤ Average Sample Number (ASN)</li> <li>➤ Average Total Inspection (ATI)</li> <li>➤ Average Outgoing Quality (AOQ)</li> <li>➤ Simple Examples based on Hypergeometric and Poisson Distribution only</li> </ul>	<b>25%</b>
----------	--	------------

#### **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. "Applied Multivariate Statistical Analysis"  
Author: Richard A. Johnson, Dean W. Wichern  
Publisher: Pearson Prentice Hall
3. "Industrial Statistics: A Handbook for Practitioners"  
Author: R. K. Gupta, D. S. Hira  
Publisher: S. Chand & Co. (Indian Edition)
4. "Business Forecasting"  
Author: John E. Hanke, Dean W. Wichern  
Publisher: Pearson Education
5. "Quality Control and Industrial Statistics"  
Author: A. C. Montgomery  
Publisher: Wiley
6. "Time Series Analysis and Forecasting: A Practical Guide for Scientists and Engineers"  
Author: A. S. Bovas Abraham, Johannes Ledolter  
Publisher: Elsevier Science
7. "Operations Research: An Introduction"  
Author: Taha, H. A.  
Publisher: Pearson Education
8. "Introduction to Time Series Analysis and Forecasting"  
Author: Douglas C. Montgomery, Cheryl L. Jennings, M. Pamela McRae  
Publisher: Wiley
9. "Statistical Methods for Quality Control"  
Author: G. K. Gupta  
Publisher: Tata McGraw-Hill Education (Indian Edition)
10. "Statistical Quality Control"  
Author: M. Mahajan  
Publisher: Dhanpat Rai & Sons (Indian Edition)
11. "Industrial Engineering and Management"  
Author: O. P. Khanna  
Publisher: Dhanpat Rai Publications (Indian Edition)
12. "Fundamentals of Applied Statistics"  
Author: S. C. Gupta, V. K. Kapoor  
Publisher: Sultan Chand & Sons (Indian Edition)
13. "Principles of Statistical Inference"  
Author: J. K. Ghosh  
Publisher: Springer
14. "Statistics for Management"  
Author: Richard I. Levin, David S. Rubin  
Publisher: Pearson Education
15. "Process Quality Control: Troubleshooting and Interpretation of Data"  
Author: J. D. Sokol  
Publisher: Wiley