Punyashlok Ahilyadevi Holkar Solapur University, Solapur

NAAC Accredited -
2022 'B^{++}'Grade
(CGPA 2.96)

Name of the Faculty: Commerce & Management

NEP 2020

Syllabus: Business Statistics

Name of the Course: B.Com. I (Sem.–I & II)

(Syllabus to be implemented June 2025-26)

Level 4.5 Semester-I
Course Code: DSC (I) - I
Business Statistics Paper-I
(Introduced from June 2025)

Preamble

The syllabus for the B.Com. Statistics is designed to follow the UGC guidelines. The syllabus of Statistics course is aimed to familiarize the students with basic concepts of the Business Statistics and hands on practice so that a student progressively develops a deeper understanding of various aspects in statistics. Statistics is learnt more through experimentation than only through classroom sessions. The experiments are designed to develop logical thinking and analytical ability.

Objectives of the course:

The main objective of this course is to acquaint students with some basic concerns statistics. They will be introduced to some elementary statistical methods of analysis and Probability at the end of this course students are expected to be able.

1. To prepare frequency distribution and represent it by graphically with the help of tables.
2. To compute various measures of central tendency, dispersion, moments, Skewness, Kurtosis and to interpret them.
3. To distinguish between random and non-random experiments.
4. To find the probabilities of the events.

Eligibility for Admission: A Candidate passing 10+2 or 12th or equivalent examination board passed from State Board / CBSE / ICSE or equivalent with minimum passing percentage of as per the directives of the higher education is eligible for admission.

Program Outcomes (POs):

The student graduating with the Degree B.Com. Statistics should be able to

1. Demonstrate the ability to use skills in Statistics and different practicing areas for formulating and tackling Statistics related problems and identifying and applying appropriate principles and methodologies to solve a wide range of problems associated with Statistics.
2. Acquire (i) fundamental/systematic or coherent understanding of the academic field of Statistics and its different learning areas and applications.(ii) procedural knowledge that creates different types of professionals related to subject area of Statistics, including professionals engaged in government/public service and private sectors; (iii) skills in areas related to one's specialization area within the disciplinary/subject area of Statistics and emerging developments in the field of Statistics..
3. Recognize the importance of statistical modeling and computing, and the role of approximation and mathematical approaches to analyze the real problems using various statistical tools.
4. Plan and execute Statistical experiments or investigations, analyze and interpret data/information collected using appropriate methods, including the use of appropriate statistical software including programming languages, and report accurately the findings of the experiment/investigations.

5. Demonstrate relevant generic skills and global competencies such as (i) problem-solving skills that are required to solve different types of Statistics related problems with well-defined solutions, and tackle open-ended problems that belong to the disciplinary-area boundaries; (ii) investigative skills, including skills of independent thinking of Statistics-related issues and problems; (iii) communication skills involving the ability to listen carefully, to read texts and reference material analytically and to present information in a concise manner to different groups/audiences of technical or popular nature; (iv) analytical skills involving paying attention to detail and ability to construct logical arguments using correct technical language related to Statistics and ability to translate them with popular language when needed; (v) ICT skills; (vi) personal skills such as the ability to work both independently and in a group.

6. Demonstrate professional behavior such as (i) being objective, unbiased and truthful in all aspects of work and avoiding unethical, irrational behavior such as fabricating, falsifying or misrepresenting data or committing plagiarism; (ii) the ability to identify the potential ethical issues in work-related situations; (iii) appreciation of intellectual property, environmental and sustainability issues; and (iv) promoting safe learning and working environment.

Program Specific Outcomes:

Students will understand the importance of collecting the data accurately by using appropriate data collection methods suitable to the characteristic under study. Concept of Descriptive Statistics of quantitative data and its techniques. Development of conceptual understanding of scales of measurement, qualitative and quantitative data and categorical analysis. Statistical techniques taught in Semester-I class will help the students- to draft the questionnaire for personal interview or mail questionnaire method of data collection and to decide the appropriate method of data collection for collecting the data accurately. To understand the structure of data and need for qualitative and quantitative classification, To draw and understand diagrammatic and graphic representation of data. In understanding of concept of probability, & its applications In preparation for Statistics Quiz and other related reputed competitive examinations. Concept of probability, discrete probability distributions.

Course Outcomes

After completion of this course the students will be able -

1. To explain the scope of Statistics in business.
2. To classify the given data using frequency distributions.
3. To distinguish between primary and secondary data.
4. To represent the given data diagrammatically as well as graphically.

4 Credits	100 marks (Semester end examination 60 and internal evaluation 40)	Total 60 hours
Unit No.	**Course Content**	**No. of Hours**
Unit-I	**Statistics-scope, data collection**	**15 hours**
	A) Scope and Limitations: Introduction, Meaning and definition of Statistics. Origin and Growth of Statistics, Importance and Scope of Statistics, Functions of Statistics, Role of a Statistician, Limitations of Statistics, Use of Statistical tools. B) Types of Data, Collection of Data: Concept of variable and Attribute, Discrete and Continuous variable, Qualitative and Quantitative data. Concept of Primary and secondary data. Methods of Primary data collection Direct and indirect inquiry, questionnaire (post and enumerations). Characteristics of an Ideal Questionnaire. Sources of Secondary data and Precautions while using of secondary data. Difference between Primary and Secondary data.	
Unit-II	**Classification, Frequency distribution and tabulation of data**	**15 hours**
	Introduction of Classification, Classification of Data, Requisite of a Good Classification, Purpose of Classification, Rules of Classifying Data, Types of Classification (Chronological or Temporal, Geographical or Spatial Classification, Qualitative and Quantitative), Importance of Classification. Group data or Frequency distribution,	
	Construction of Frequency Distribution, Types of Frequency distribution (Discrete, Continuous, Cumulative and Relative), Introduction of Tabulation, Functional Parts of a Statistical Table, Types of Tables (One-way, two-way and Manifold), Requirements of a Good Table, Tabulation.	
Unit-III	**Diagrammatic presentation of data**	**15 hours**

	Introduction, Types of the diagram [One dimensional (Bar diagram, Multiple bar diagram, Simple divided bar diagram), Two dimensional (Pie-diagram).	
Unit-IV	**Graphical presentation of data**	**15 hours**
	Introduction, Types of graphs of frequency distribution. Comparison between the Histogram and the Frequency Polygon, Cumulative Frequency Curve or Ogive.	

Reference Books Recommended:

1. Gupta S. C. & Kapoor V. K.: Fundamental of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. Gupta S. C. & Kapoor V. K.: Fundamental of Applied Statistics, Sultan Chand & Sons, New Delhi.
3. Gupta A.C.: Fundamental of Applied Statistics, Sultan Chand& Sons, New Delhi.
4. Kenny &Keeping: Mathematics of Statistics Volume I and II, Van Nastran.
5. Ken Blank: Business Statistics, Willey India (P.) Ltd., New Delhi.
6. Goon Gupta & Dasgupta: Fundamental of Statistics Volume I and II, World Press, Calcutta.
7. Spiegel M. R.: Theory and Problems of Statistics, McGraw Hill Book Co., London.
8. Shenoy G.V., Srivastava U.K.& Sharma S.C.: Business Statistics, Wiley Eastern.
9. Das G.& Patnaik: Fundamentals of Mathematical Analysis, Tata McGraw Hill, New Delhi.
10. D.N. Elance (1956): Fundamentals of Statistics Kitab Mahal, Allahabad.
11. D. C. Sancheti and V. K. Kapoor: Statistics (Theory and Application), Sultan Chand & Sons Publication, New Delhi.
12. Meyer P. L. (1970): Introductory Probability and statistical application, Addison Wesley.
13. DeGroot M. H. (1975): Probability and Statistics, Addison Wesley.
14. Rohatgi V. K. (1986): An introduction to probability theory and Mathematical statistics, Wiley Eastern.

Level 4.5 Semester-I
Course Code: Open Elective 2
Introduction to Statistics -I
(Introduced from June 2025)

Course Outcomes:
After completion of this course the students will be able -

1. To explain the scope of Statistics in business.
2. To classify the given data using frequency distributions.

2 Credits	50 marks (Semester end examination 30 and internal evaluation 20)	Total 30 hours
Unit No.	**Course Content**	**No. of Hours**
Unit-I	**Statistics-scope, data collection**	**15 hours**
	A) Scope and Limitations: Introduction, Meaning and definition of Statistics. Origin and Growth of Statistics, Importance and Scope of Statistics, Functions of Statistics, Role of a Statistician, Limitations of Statistics, Use of Statistical tools. B) Types of Data, Collection of Data: Concept of variable and Attribute, Discrete and Continuous variable, Qualitative and Quantitative data. Concept of Primary and secondary data. Methods of Primary data collection Direct and indirect inquiry, questionnaire (post and enumerations). Characteristics of an Ideal Questionnaire. Sources of Secondary data and Precautions while using of secondary data. Difference between Primary and Secondary data.	
Unit-II	**Classification, Frequency distribution and tabulation of data**	**15 hours**
	Introduction of Classification, Classification of Data, Requisite of a Good Classification, Purpose of Classification, Rules of Classifying Data, Types of Classification (Chronological or Temporal, Geographical or Spatial Classification, Qualitative and Quantitative), Importance of Classification. Group data or Frequency distribution, Construction of Frequency Distribution, Types of Frequency distribution (Discrete, Continuous, Cumulative and Relative), Introduction of Tabulation, Functional Parts of a Statistical Table, Types of Tables (One-way, two-way and Manifold), Requirements of a Good Table, Tabulation.	

Note: Use of non-programmable calculator is allowed.

Reference Books Recommended:

1. Gupta S. C. & Kapoor V. K.: Fundamental of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. Gupta S. C. & Kapoor V. K.: Fundamental of Applied Statistics, Sultan Chand & Sons, New Delhi.

3. Gupta A.C.: Fundamental of Applied Statistics, Sultan Chand& Sons, New Delhi.
4. Gupta S. C.: Statistical Methods, Sultan Chand and Sons Publication.
5. Gupta C.B.: Introduction to Statistics.
6. Rohatgi V. K. (1986): An introduction to probability theory and Mathematical statistics, Wiley Eastern.

Level 4.5 Semester-I
Course Code: Vocational Skill Course 1
Practical -I
(Introduced from June 2025)

Course Outcomes:

After completion of this course the students will be able -

1. To understand the fundamental concept and techniques of data tabulation.
2. To develop skill in constructing the various diagrams and graphs.

2 Credits	50 marks (Semester end examination 30 and internal evaluation 20)	Total 30 hours
Unit No.	**Course Content**	**No. of Hours**
	List of Practical	**30 hours**
	1. Data Tabulation -I (Frequency Distributions) 2. Construction of the bar diagram. 3. Construction of Multiple and Sub-divided bar diagram. 4. Construction of Line chart and Pie Chart. 5. Construction of Histogram. 6. Construction of frequency polygon and frequency curve. 7. Construction of ogive curves.	

Reference Books Recommended:

1. Agarwal B. L.: Programmed Statistics, New Age International Limited, New Delhi fourth Edition, 2021
2. Kieran Healy, Data Visualization A Practical Introduction, Princeton University Press, 2018
3. Claus O. Wilke, Fundamentals of Data Visualization, O'Reilly Media, 1st edition, 2019

Level 4.5 Semester-I
Course Code: Skill Enhancement Course 1
Introduction to MS-Excel
(Introduced from June 2025)

Course Outcomes:
After completion of this course the students will be able -

1. To understand the fundamental concept and techniques of data tabulation using MS-Excel.
2. To develop skill in constructing the various diagrams and graphs using MS-Excel.

2 Credits	50 marks (Semester end examination 30 and internal evaluation 20)	Total 30 hours
Unit No.	**Course Content**	**No. of Hours**
	List of Practical	**30 hours**
	Note: - Complete the entire following Practical's by using MS-Excel. 1. Data Tabulation -I (Frequency Distributions) 2. Construction of the bar diagram. 3. Construction of Multiple and Sub-divided bar diagram. 4. Construction of Line chart and Pie Chart. 5. Construction of Histogram. 6. Construction of frequency polygon and frequency curve. 7. Construction of ogive curves.	

Reference Books Recommended:

1. Agarwal B. L.: Programmed Statistics, New Age International Limited, New Delhi fourth Edition, 2021
2. Kieran Healy, Data Visualization A Practical Introduction, Princeton University Press, 2018
3. Claus O. Wilke, Fundamentals of Data Visualization, O'Reilly Media, 1st edition, 2019
4. Dr. B. G. Kore, MS-Excel for data Analysis, Nirali Prakashan
5. David M Lovino, Statistics for Managers using Microsoft Excel, Pearson

Level 4.5 Semester-II
Course Code: DSC (I) –II
Business Statistics Paper-II
(Introduced from June 2025)

Course Outcomes
After completion of this course the students will be able -

1. To understand the need and mechanism of sampling.
2. To understand different types of sampling and their uses.
3. To identify different components of time series as well as and to measure trend component.
4. To compute various types of index numbers.

4 Credits	**100 marks (Semester end examination 60 and internal evaluation 40)**	**Total 60 hours**
Unit No.	**Course Content**	**No. of Hours**
Unit-I	Sampling -I	15 hours
	Introduction, Concept of a Population and sample from population. Difference between Population and Sample Inquiry. Advantage of Sample Inquiry. Concept of Sampling, Purpose of Sampling, Definitions of Population, sample, sampling and census. Principles step in sample survey, Advantages of sampling over census method.	
Unit-II	Sampling -II	15 hours
	Methods of Sampling: Simple random sampling (With and Without replacement), Stratified random sampling, its merits and demerits. Illustrative Examples.	
Unit-III	Business Forecasting and Time series	15 hours
	Introduction, steps in forecasting, Requirement of good forecasting system, Methods of Forecasting. Concept of Time series, Definitions and uses of time series, Components of time series: Secular Trend, Seasonal variations, Cyclical variations and Irregular variations. Methods of measuring trend: Freehand or Graphic method, Method of Semi-Averages, Methods of Moving Averages. Merits and Limitations of all these methods. Illustrative Examples.	
Unit-IV	Index Number	15 hours
	Definition, Characteristics, Limitation and use of index numbers. Problem in the Construction of Index number, Price relative, Quantity relative andValue relative, Applications of Index Numbers in Share Market. Price, Quantity and Value	

	Index number. Methods of Construction Index Numbers: Unweighted Index Number: Simple Aggregative method, Simple average of Relatives method. Merits and Limitations of this method. Weighted Index Number: Weighted Aggregate method, Weighted average of relative method. Illustrative Examples.	

Note: Use of non-programmable calculator is allowed.

Reference Books Recommended:

1. Gupta S. C. & Kapoor V. K. : Fundamental of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. Gupta S. C. & Kapoor V. K. : Fundamental of Applied Statistics, Sultan Chand & Sons, New Delhi.
3. Gupta A. C. : Fundamental of Applied Statistics, Sultan Chand& Sons, New Delhi.
4. Kenny & Keeping: Mathematics of Statistics Volume I and II, VanNostran.
5. Ken Blank: Business Statistics, Willey India (P.)Ltd., New Delhi.
6. Goon Gupta & Dasgupta: Fundamental of Statistics Volume I and II, World Press, Calcutta.
7. Spiegel M.R.: Theory and Problems of Statistics, McGraw Hill Book Co., London.
8. Shenoy G.V., Srivastava U.K. & Sharma S. C. : Business Statistics, Wiley Eastern.
9. Das G.& Patnaik: Fundamentals of Mathematical Analysis, Tata McGraw Hill, New Delhi.
10. D. N. Elance (1956) : Fundamentals of Statistics Kitab Mahal ,Allahabad.
11. D.C. Sancheti and V.K. Kapoor: Statistics (Theory and Application), Sultan Chand& Sons Publication, New Delhi.
12. Meyer P. L. (1970): Introductory Probability and statistical application, Addison Wesley.
13. DeGroot M. H. (1975): Probability and Statistics, Addison Wesley. Mood A. M. Graybill F. A .and Bose D. C. (1974): Introduction to the theory of Statistics, McGraw Hill.
14. Rohatgi V. K. (1986): An introduction to probability theory and Mathematical statistics, Wiley Eastern.

Level 4.5 Semester-II
Course Code: DSM1 (Minor)
Elementary Statistics
(Introduced from June 2025)

Course Outcomes:
After completion of this course the students will be able -

1. To explain the scope of Statistics in business.
2. To classify the given data using frequency distributions.

2 Credits	50marks (Semester end examination 30 and internal evaluation 20)	Total 30 hours
Unit No.	**Course Content**	**No. of Hours**
Unit-I	**Statistics-scope, data collection**	**15 hours**
	A) Scope and Limitations: Introduction, Meaning and definition of Statistics. Origin and Growth of Statistics, Importance and Scope of Statistics, Functions of Statistics, Role of a Statistician, Limitations of Statistics, Use of Statistical tools. B) Types of Data, Collection of Data: Concept of variable and Attribute, Discrete and Continuous variable, Qualitative and Quantitative data. Concept of Primary and secondary data. Methods of Primary data collection Direct and indirect inquiry, questionnaire (post and enumerations). Characteristics of an Ideal Questionnaire. Sources of Secondary data and Precautions while using of secondary data. Difference between Primary and Secondary data.	
Unit-II	**Classification, Frequency distribution and tabulation of data**	**15 hours**
	Introduction of Classification, Classification of Data, Requisite of a Good Classification, Purpose of Classification, Rules of Classifying Data, Types of Classification (Chronological or Temporal, Geographical or Spatial Classification, Qualitative and Quantitative), Importance of Classification. Group data or Frequency distribution, Construction of Frequency Distribution, Types of Frequency distribution (Discrete, Continuous, Cumulative and Relative), Introduction of Tabulation, Functional Parts of a Statistical Table, Types of Tables (One-way, two-way and Manifold), Requirements of a Good Table, Tabulation.	

Note: Use of non-programmable calculator is allowed.

Reference Books Recommended:

1. Gupta S. C. & Kapoor V. K.: Fundamental of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. Gupta S. C. & Kapoor V. K.: Fundamental of Applied Statistics, Sultan Chand & Sons, New Delhi.
3. Gupta A.C.: Fundamental of Applied Statistics, Sultan Chand& Sons, New Delhi.
4. Gupta S. C.: Statistical Methods, Sultan Chand and Sons Publication.
5. Gupta C.B.: Introduction to Statistics.
6. Rohatgi V. K. (1986): An introduction to probability theory and Mathematical statistics, Wiley Eastern.

Level 4.5 Semester-II
Course Code: Open Elective 4
Introduction to Statistics -II
(Introduced from June 2025)

Course Outcomes:

After completion of this course the students will be able -

1. To explain the given data Diagrammatically.
2. To construct various graphs.

2 Credits	50 marks (Semester end examination 30 and internal evaluation 20)	Total 30 hours
Unit No.	**Course Content**	**No. of Hours**
Unit-I	**Diagrammatic presentation of data**	**15 hours**
	Introduction, Types of the diagram [One dimensional (Bar diagram, Multiple bar diagram, Simple divided bar diagram), Two dimensional (Pie-diagram).	
Unit-II	**Graphical presentation of data**	**15 hours**
	Introduction, Types of graphs of frequency distribution. Comparison between the Histogram and the Frequency Polygon, Cumulative Frequency Curve or Ogive.	

Note: Use of non-programmable calculator is allowed.

Reference Books Recommended:

1. Gupta S. C. & Kapoor V. K.: Fundamental of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. Gupta S. C. & Kapoor V. K.: Fundamental of Applied Statistics, Sultan Chand & Sons, New Delhi.
3. Kieran Healy, Data Visualization A Practical Introduction, Princeton

University Press, 2018
4. Claus O. Wilke, Fundamentals of Data Visualization, O'Reilly Media, 1st edition, 2019

Level 4.5 Semester-II
Course Code: Vocational Skill Course 2
Practical -II
(Introduced from June 2025)

Course Outcomes:

After completion of this course the students will be able -

1. To use various sampling methods in real life situations.
2. To construct price and quantity index number.

2 Credits	50 marks (Semester end examination 30 and internal evaluation 20)	Total 30 hours
Unit No.	**Course Content**	**No. of Hours**
	List of Practical	**30 hours**
	1. Sampling -I (Simple random sampling and stratified random sampling). 2. Computation of Trend by using Graphical and Semi-average method. 3. Computation of Trend by using 3-yearly Moving average method. 4. Computation of Trend by using 5-yearly Moving average method. 5. Computation of Trend by using 4-yearly centered Moving average method. 6. Construction of Price index numbers using Simple and weighted method. 7. Construction of Quantity index numbers using Simple and weighted method.	

Reference Books Recommended:

1. Gupta S. C. & Kapoor V. K.: Fundamental of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. Gupta S. C. & Kapoor V. K.: Fundamental of Applied Statistics, Sultan Chand & Sons, New Delhi.
3. Kieran Healy, Data Visualization A Practical Introduction, Princeton
4. Gupta S. C. & Gupta M. P.: Business Statistics, Sultan Chand & Sons, New Delhi.

Level 4.5 Semester-II
Course Code: Skill Enhancement Course 2
Advanced Excel
(Introduced from June 2025)

Course Outcomes:
After completion of this course the students will be able -

1. To use various sampling methods in real life situations by using MS-excel.
2. To construct price and quantity index number by using MS-Excel.

2 Credits	50 marks (Semester end examination 30 and internal evaluation 20)	Total 30 hours
Unit No.	**Course Content**	**No. of Hours**
	List of Practical	**30 hours**
	Note: - Complete the entire following Practical's by using MS-Excel. 1. Sampling -I (Simple random sampling and stratified random sampling). 2. Computation of Trend by using Graphical and Semi-average method. 3. Computation of Trend by using 3-yearly Moving average method. 4. Computation of Trend by using 5-yearly Moving average method. 5. Computation of Trend by using 4-yearly centered Moving average method. 6. Construction of Price index numbers using Simple and weighted method. 7. Construction of Quantity index numbers using Simple and weighted method.	

Reference Books Recommended:

1. Agarwal B. L.: Programmed Statistics, New Age International Limited, New Delhi fourth Edition, 2021
2. Kieran Healy, Data Visualization A Practical Introduction, Princeton University Press, 2018
3. Claus O. Wilke, Fundamentals of Data Visualization, O'Reilly Media, 1st edition, 2019
4. Dr. B. G. Kore, MS-Excel for data Analysis, Nirali Prakashan
5. David M Lovino, Statistics for Managers using Microsoft Excel, Pearson