Academic Council Meeting No. and Date : 8 / September 04, 2023
Agenda Number : 2 Resolution Number : 34, 35 / 2.5, 2.26

Vidya Prasarak Mandal's

B. N. Bandodkar College of Science (Autonomous), Thane

Syllabus for
Program code: BUST

Programme: Bachelor of Science

Specific Programme: STATISTICS

[F.Y.B.Sc. Statistics]

Level 4.5

CHOICE BASED GRADING SYSTEM

Revised under NEP

From Academic Year 2023-2024

Preamble

VPM's B.N. Bandodkar College (Autonomous), Department of Statistics is revamped the entire course of Bachelor of Science in Statistics according to the guidelines prescribed under the NEP-2020 and the process of restructuring the F.Y.B.Sc syllabus according to the NEP-2020 was initiated for its implementation from academic year 2023-24.

The B.Sc. Statistics programme is aimed to develop the theoretical and analytical skills of the students so that they may be absorbed in the corporate world or able to pursue higher studies at the Master's level in Statistics. Statistical concepts and techniques will be taught to students so that they not only know how and when to use the statistical procedures but also to understand why these procedures should be used. Efforts will be taken to explain the ideas behind the statistical concepts and techniques.

The main objectives of the course are:

- To introduce statistical concepts that are relevant in the interpretation of measurements made on individuals and in the interpretation of statistical study materials.
- To get Knowledge and understanding of basic statistical methods such as sampling and collecting data, probability, distributions, and Regression Analysis.
- To be capable of managing Statistics projects with consideration of human, financial and environmental factors.
- To work effectively as a part of a team to achieve a common stated goal.
- To communicate effectively with a range of audiences both technical and non-technical.
- To develop an aptitude to engage in continuing professional development.

The syllabus is aimed to achieve these above objectives. The students will be ready for the jobs available in different fields like:

- Statistician
- Analyst
- Biostatistician
- Actuaries
- Banking sector
- Data Analytics
- Academics
- Government organizations like NSSO, NSO, ISS, SSC etc. And many others.

PROGRAMME OUTCOMES (POs) OF BACHELOR OF SCIENCE (B.Sc.)

The Undergraduate Programmes of Science are intended to cater quality education and attain holistic development of learners through the following programme outcomes:

PO1 - Disciplinary Knowledge

Lay a strong foundation of conceptual learning in science. Instill ability to apply science in professional, social and personal life.

PO2 - Inculcation of Research Aptitude

Ignite spirit of inquiry, critical thinking, analytical skills and problem-solving approach which will

help learners to grasp concepts related to research methodology and execute budding research ideas.

PO3 - Digital Literacy

Enhance ability to access, select and use a variety of relevant information e-resources for curricular, co-curricular and extracurricular learning processes.

PO4 - Sensitization towards Environment

Build a cohesive bond with nature by respecting natural resources, encouraging eco-friendly practices and creating awareness about sustainable development.

PO5 - Individuality and Teamwork

Encourage learners to work independently or in collaboration for achieving effective results through practical experiments, project work and research activities.

PO6 - Social and Ethical Awareness

Foster ethical principles which will help in developing rational thinking and becoming socially aware citizens. Build an attitude of unbiased, truthful actions and avoid unethical behavior in all aspects of life.

Eligibility: Passed 12th standard (HSC) of any recognized board with mathematics and statistics subject.

Duration: 1 year (Including Semester I & II)

Total Credits for the Program: 44

Starting year of implementation: 2023-24

Mode of Conduct: Offline

Discipline/Subject: Statistics

Programme Specific Outcomes:

After successful completion of this course, every leaner will be able to:

1. Apply fundamental concepts of descriptive statistics, statistical methods, probability distributions, sampling theory, ANOVA, DOE, estimation theory, hypothesis testing, and reliability analysis to analyze, interpret, and solve real-world problems across diverse domains.
2. Demonstrate proficiency in using Excel, Tableau, Python, and SQL for data handling, cleaning, visualization, analysis, and reporting, enabling them to work effectively in data-driven environments.
3. Design and implement statistical models, including probability-based models, stochastic

processes, regression techniques, and other inferential procedures to derive meaningful insights from data.

4. Apply Operations Research techniques, including linear programming, simplex method, inventory, transportation and assignment problems, and simulation models to optimize decision-making in business, industry, and management applications.
5. Build and evaluate basic machine learning models using Python, integrate statistical algorithms with computational approaches, and use programming skills to automate analysis and solve complex data problems.
6. Apply statistical techniques to vital statistics, demographic measures, public health data, life tables, and population studies, ensuring accurate interpretation and planning for social, health, and administrative applications.

Specific Programme:

F.Y.B.Sc. (Statistics) (Major/Minor) Credits: 06
F.Y.B.Sc (Statistics) (Generic) Credits: 02
F.Y.B.Sc (Statistics) (Vocational Skill Enhancement) Credits: 02

Assessment:

Weightage for assessments (in percentage) For Major and Minor

Type of Course	Formative Assessment / IA	Summative Assessment
Theory	40%	60%
Practical	-	100%

VPM's B. N. Bandodkar College of Science (Autonomous), Thane

Semester 1: Major			
Course Code	**Course Title**	**No. of lectures In hrs**	**Credits**
23BUST1T01	Descriptive Statistics – I	**30**	**2**
23BUST1T02	Statistical Methods – I	**30**	**2**
23BUST1P01	Practical Based on 23BUST1T01 & 23BUST1T02	**60**	**2**
23BU1VSC01	Advanced Spreadsheets Tools	**45**	**2**
	Total	**165**	**8**

Semester 1: Minor			
Course Code	**Course Title**	**No. of lectures In hrs**	**Credits**
23BUST1T03	Descriptive Statistics – I	**30**	**2**
23BUST1T04	Statistical Methods - I	**30**	**2**
23BUST1P02	Practical Based on 23BUST1T03 & 23BUST1T04	**60**	**2**
	Total	**120**	**6**
Semester 1: Generic			
23BUST1T05	Basics of Statistics -I (Generic-I)	**30**	**2**
	Total	**30**	**2**

Semester 2: Major			
Course Code	**Course Title**	**No. of lectures In hrs**	**Credits**
23BUST2T01	Descriptive Statistics – II	**30**	**2**
23BUST2T02	Statistical Methods – II	**30**	**2**
23BUST2P01	Practical Based on 23BUST2T01 & 23BUST2T02	**60**	**2**
23BU2VSC01	Tableau	**45**	**2**
	Total	**165**	**8**
Semester 2: Minor			
Course Code	**Course Title**	**No. of lectures In hrs**	**Credits**
23BUST2T03	Descriptive Statistics – II	**30**	**2**
23BUST2T04	Statistical Methods – II	**30**	**2**
23BUST2P02	Practical Based on 23BUST2T03 & 23BUST2T04	**60**	**2**
	Total	**120**	**6**
Semester 2: Generic			
23BUST2T05	Basics of Statistics -II (Generic-II)	**30**	**2**
	Total	**30**	**2**

Semester I
(Statistics-Major)

Course Code: 23BUST1T01

CO1	Explain the technique of data collection and demonstrate methods of presenting data	L2
CO2	Explain the need of numerical measures of summary for data analysis	L2
CO3	Apply statistical methods to classify data	L3
CO4	Summarize basic statistical properties of any data	L2

Grading will be as 3: High(>60%), 2: Moderate(40%-60%), 1: Low(<40%), 0: No mapping

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	1	0	0	0
CO2	3	2	2	1	0	0
CO3	2	1	3	1	0	0
CO4	3	2	3	0	0	0

Course Code 23BUST1T01	**Course Title Descriptive Statistics – I**	**Credits 2**	**No. of in hours**
Unit I :	**<u>Types of Data and Data Condensation:</u>** **Types of data**: Qualitative and Quantitative data, Geographical, Time series data, Cross-section data, Discrete and Continuous data. **Types of Characteristics**, **Different types of scales**: nominal, ordinal, interval and ratio. **Collection of Data**: Concept of population and sample. Finite and Infinite population, Notion of SRS, SRSWOR and SRSWR **Primary data**: Concepts of Questionnaire and a schedule, distinction between them, problems collecting data through the Questionnaire. Secondary data. Their Merits and Demerits. **Elementary Categorical Data Analysis:** Preparation of tables with two or three factors (variable/attributes) of classification, Verification for consistency. Requisites of a good table. Independence and Association for 2 attributes in a 2×2 table using Yule's coefficient of colligation and coefficient of association. Relationship between two coefficients.		**15**

Unit II :	**Classification of Data and Measure of Central Tendency:** **Classification and Data Presentation:** Frequency distribution of discrete and continuous variables. Cumulative frequency distribution. Graphical representation of frequency distribution by Histogram, Frequency polygon, Cumulative Frequency Curve and Ogives. Diagrammatic representation using Bar diagrams and Pie Chart. Stem and leaf diagram, Dot plot. **Measures of Central Tendency:** Concept of central tendency of data. Requirements of good measure. Location averages: Median, Mode, and Partition Values: Quartiles, Deciles, and Percentiles. Mathematical averages: Arithmetic mean (Simple mean, Weighted mean, and Combined mean), Geometric mean, and Harmonic mean. Relation Between Arithmetic mean, Geometric mean, and Harmonic mean. Empirical relation between mean, median and mode. Merits and demerits of using different measures &their applicability.	**15**

Books and References:

1. Medhi J.: Statistical Methods, An Introductory Text, Second Edition, New Age International Ltd.
2. Agarwal B. L.: Basic Statistics, New Age International Ltd.
3. Spiegel M. R.: Theory and Problems of Statistics, Schaum's Publications series. Tata McGraw-Hill.
4. Kothari C. R.: Research Methodology, Wiley Eastern Limited.
5. Gupta, S. C. and Kapoor, V. K. (2002), Fundamentals of Mathematical Statistics, eighth Edition, Sultan Chand and Sons Publishers, New Delhi.
6. Gupta, S. C. and Kapoor, V. K. (2004), Fundamentals of Applied Statistics, Third Edition, Sultan Chand and Sons Publishers, New Delhi.

Course Code: 23BUST1T02

CO1	Define various terminologies used in probability theory and various definitions of probability of an event.	L1
CO2	Apply Baye's theorem to find posterior probabilities of the events	L3
CO3	Identify different types of random variables and discrete probability distributions.	L3
CO4	Solve real life problems using various discrete distributions	L3

Grading will be as 3: High(>60%), 2: Moderate(40%-60%), 1: Low(<40%), 0: No mapping

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	**2**	**2**	**0**	**0**	**0**	**0**
CO2	**2**	**2**	**0**	**0**	**0**	**1**
CO3	**2**	**3**	**0**	**0**	**0**	**0**
CO4	**3**	**3**	**0**	**0**	**0**	**2**

Course Code 23BUST1T02	Course Title **Statistical Methods - I**	Credits 2	No. of in hours
Unit I :	**Elementary Probability Theory:** Probability: Trial, Random experiment, Sample point and Sample Space. Definition of an event. Operation of events, mutually exclusive and exhaustive events. Classical (Mathematical) and Empirical and Axiomatic definitions of Probability and their properties. Theorems on Addition and Multiplication of probabilities. Independence of n events (n =2,3), pairwise and mutual independence for three event Conditional probability, Bayes theorem (with proof) and its applications.		15
Unit II :	**Concepts of Discrete random variable:** Univariate: Random variable, Definition and properties of Probability Mass Function and Cumulative Distribution Function of discrete random variable and their graphical representation. Expectation of a random variable. Theorems on Expectation & Variance. Raw and Central moments (definition only) and their relationship (up to order four). Concepts of Skewness and Kurtosis. Definition of Bivariate random variable, Joint probability mass function of two Discrete Random Variables. Marginal and Conditional Probability Distributions, Independence of two random variables, Theorems on Expectation &Variance, Covariance and Coefficient of Correlation. **Standard Discrete Probability Distributions:** Discrete Distributions: Degenerate distributions, Discrete Uniform distribution, Bernoulli distribution, Binomial distribution, Poisson distribution. Derivation of their mean and variance.		15

Reference Books:

1. J. Medhi (2006): *Statistical Methods: An Introductory Text*, New Age International Pvt Ltd Publishers
2. Hogg R.V., Tannis E. A.(2014): *Probability and Statistical Inference*, Nineth Edition; Collier McMillan Publishers.
3. Arora Sanjay and BansiLal (1989) : *New Mathematical Statistics*, SatyaPrakashan, New Market, New Delhi,5
4. Gupta S.C., Kapoor V. K. (2014): *Fundamentals of Mathematical Statistics*; Eleventh Edition; Sultan Chand & Sons.
5. Mood, A.M., Graybill, F.A. & Boes, D.C. (1974): *Introduction to the Theory of Statistics.* 3rd ed. New York: McGraw-Hill.
6. Rohatgi, V.K. & Saleh, A.K.M.E. (2015): *An Introduction to Probability and Statistics*. 3rd ed. Hoboken, NJ: John Wiley & Sons.
7. Gupta, S. C. and Kapoor, V. K. (2014), *Fundamentals of Applied Statistics*, Fourth Edition, Sultan Chand and Sons Publishers, New Delhi

Course Code: 23BUST1P01

CO1	Identify different data types and discuss different methods of data collection and basic sampling techniques.	L3
CO2	Draw and interpret: histograms, stem−and−leaf diagrams, & cumulative frequency distributions.	L2
CO3	Apply various probability theorems to solve the problems using R- software as well as scientific calculator.	L3
CO4	Solve various problems based on discrete probability distributions using R-software as well as scientific calculator.	L6

Grading will be as 3: High(>60%), 2: Moderate(40%-60%), 1: Low(<40%), 0: No mapping

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	**2**	**3**	**3**	**0**	**2**	**2**
CO2	**2**	**3**	**3**	**0**	**2**	**2**
CO3	**2**	**3**	**3**	**0**	**2**	**2**
CO4	**3**	**3**	**3**	**0**	**2**	**2**

Course Code **23BUST1P01**	**Course Title** **Descriptive Statistics – I** **and** **Statistical Methods -I Practical**	**Credits** **2**
Practical No.	**Descriptive Statistics - 1 Practical's**	
1.1.1	Tabular Representation.	
1.1.2	Theory of Attributes.	
1.1.3	Classification of Data.	
1.1.4	Diagrammatic and Graphical Representation.	
1.1.5	Measure of Central Tendency	
1.1.6	Practical using R software: Classification of Data and Diagrammatic representation.	
Practical No.	**Statistical Methods- 1 Practical's**	
1.2.1	Probability - I.	
1.2.2	Probability - II.	
1.2.3	Random Variable, Mean and Variance	
1.2.4	Bivariate Distribution and Correlation	
1.2.5	Binomial and Discrete Uniform Distributions	
1.2.6	Poisson Distribution	

Semester I
(Statistics-Minor)

Course Code: 23BUST1T03

CO1	Explain the technique of data collection and demonstrate methods of presenting data	L1
CO2	Explain the need of numerical measures of summary for data analysis	L2
CO3	Apply statistical methods to classify data	L3
CO4	Summarize basic statistical properties of any data	L2

Grading will be as 3: High(>60%), 2: Moderate(40%-60%), 1: Low(<40%), 0: No mapping

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	1	0	0	0
CO2	3	2	2	1	0	0
CO3	2	1	3	1	0	0
CO4	3	2	3	0	0	0

Course Code 23BUST1T03	**Course Title** **Descriptive Statistics - I**	**Credits 2**	**No. of hours**
Unit I:	**Types of Data and Data Condensation:** **Types of data**: Qualitative and Quantitative data, Geographical, Time series data, Cross-section data, Discrete and Continuous data. **Types of Characteristics**, **Different types of scales**: nominal, ordinal, interval and ratio. **Collection of Data**: Concept of population and sample. Finite and Infinite population, Notion of SRS, SRSWOR and SRSWR **Primary data**: Concepts of Questionnaire and a schedule, distinction between them, problems collecting data through the Questionnaire. Secondary data. Their Merits and Demerits. **Elementary Categorical Data Analysis:** Preparation of tables with two or three factors (variable/attributes) of classification, Verification for consistency. Requisites of a good table. Independence and Association for 2 attributes in a 2×2 table using Yule's coefficient of colligation and coefficient of association. Relationship between two coefficients.		**15**
Unit II:	**Classification of Data and Measure of Central Tendency:** **Classification and Data Presentation:** Frequency distribution of discrete and continuous variables. Cumulative frequency distribution. Graphical representation of frequency distribution by Histogram, Frequency polygon, Cumulative Frequency Curve and Ogives. Diagrammatic representation using Bar diagrams and Pie Chart. Stem and leaf diagram, Dot plot. **Measures of Central Tendency:** Concept of central tendency of data. Requirements of good measure.		**15**

	Location averages: Median, Mode, and Partition Values: Quartiles, Deciles, and Percentiles. Mathematical averages: Arithmetic mean (Simple mean, Weighted mean, and Combined mean), Geometric mean, and Harmonic mean. Relation Between Arithmetic mean, Geometric mean, and Harmonic mean. Empirical relation between mean, median and mode. Merits and demerits of using different measures &their applicability.	

Books and References:

1. Medhi J.: Statistical Methods, An Introductory Text, Second Edition, New Age International Ltd.
2. Agarwal B. L.: Basic Statistics, New Age International Ltd.
3. Spiegel M. R.: Theory and Problems of Statistics, Schaum's Publications series. Tata McGraw-Hill.
4. Kothari C. R.: Research Methodology, Wiley Eastern Limited.
5. Gupta, S. C. and Kapoor, V. K. (2002), Fundamentals of Mathematical Statistics, eighth Edition, Sultan Chand and Sons Publishers, New Delhi.
6. Gupta, S. C. and Kapoor, V. K. (2004), Fundamentals of Applied Statistics, Third Edition, Sultan Chand and Sons Publishers, New Delhi.

Course Code: 23BUST1T04

CO1	Define various terminologies used in probability theory and various definitions of probability of an event.	L1
CO2	Apply Baye's theorem to find posterior probabilities of the events	L3
CO3	Identify different types of random variables and discrete probability distributions.	L3
CO4	Solve real life problems using various discrete distributions	L3

Grading will be as 3: High(>60%), 2: Moderate(40%-60%), 1: Low(<40%), 0: No mapping

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	**2**	**2**	**0**	**0**	**0**	**0**
CO2	**2**	**2**	**0**	**0**	**0**	**1**
CO3	**2**	**3**	**0**	**0**	**0**	**0**
CO4	**3**	**3**	**0**	**0**	**0**	**2**

Course Code	**Course Title**	**Credits**	**No. of hours**
23BUST1T04	**Statistical Methods - I**	**2**	
Unit I :	**<u>Elementary Probability Theory :</u>** Probability: Trial, Random experiment, Sample point and Sample Space. Definition of an event. Operation of events, Mutually exclusive and exhaustive events. Classical (Mathematical) and Empirical and Axiomatic definitions of Probability and their properties. Theorems on Addition and Multiplication of probabilities. Independence of n events (n =2,3), pairwise and mutual independence for three event Conditional probability, Bayes theorem(with proof) and its applications.		15

Unit II :	**Concepts of Discrete random variable :** Univariate: Random variable, Definition and properties of Probability Mass Function and Cumulative Distribution Function of discrete random variable and their graphical representation. Expectation of a random variable. Theorems on Expectation & Variance. Raw and Central moments (definition only) and their relationship (up to order four). Concepts of Skewness and Kurtosis. Definition of Bivariate random variable, Joint probability mass function of two Discrete Random Variables. Marginal and Conditional Probability Distributions, Independence of two random variables, Theorems on Expectation &Variance, Covariance and Coefficient of Correlation. **Standard Discrete Probability Distributions:** Discrete Distributions: Degenerate distributions, Discrete Uniform distribution, Bernoulli distribution, Binomial distribution, Poisson distribution. Derivation of their mean and variance.	15

Reference Books:

1. J. Medhi (2006): *Statistical Methods: An Introductory Text*, New Age International Pvt Ltd Publishers
2. Hogg R.V., Tannis E. A.(2014): *Probability and Statistical Inference*, Nineth Edition; Collier McMillan Publishers.
3. Arora Sanjay and BansiLal (1989) : *New Mathematical Statistics*, SatyaPrakashan, New Market, New Delhi,5
4. Gupta S.C., Kapoor V. K. (2014): *Fundamentals of Mathematical Statistics*; Eleventh Edition; Sultan Chand & Sons.
5. Mood, A.M., Graybill, F.A. & Boes, D.C. (1974): *Introduction to the Theory of Statistics.* 3rd ed. New York: McGraw-Hill.
6. Rohatgi, V.K. & Saleh, A.K.M.E. (2015): *An Introduction to Probability and Statistics*. 3rd ed. Hoboken, NJ: John Wiley & Sons.
7. Gupta, S. C. and Kapoor, V. K. (2014), *Fundamentals of Applied Statistics*, Fourth Edition, Sultan Chand and Sons Publishers, New Delhi

Course Code: 23BUST1P02

CO1	Classify and tabulate data	L1
CO2	Summarize basic statistical properties of data	L3
CO3	Apply various probability theorems to solve the problems using R- software as well as scientific calculator.	L3
CO4	Solve various problems based on discrete probability distributions using R-software as well as scientific calculator.	L6

Grading will be as 3: High(>60%), 2: Moderate(40%-60%), 1: Low(<40%), 0: No mapping

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	**3**	**3**	**3**	**0**	**1**	**1**
CO2	**3**	**2**	**3**	**0**	**2**	**2**
CO3	**2**	**3**	**3**	**0**	**2**	**2**
CO4	**3**	**3**	**3**	**0**	**2**	**2**

Course Code **23BUST1P02**	**Course Title** **Practical Based on 23BUSTT03 & 23BUST1T04**	**Credits** **2**
Practical No.	**Descriptive Statistics - 1 Practicals**	
1.1.1	Tabular Representation.	
1.1.2	Theory of Attributes.	
1.1.3	Classification of Data.	
1.1.4	Diagrammatic and Graphical Representation.	
1.1.5	Measure of Central Tendency	
1.1.6	Practical using R software: Classification of Data and Diagrammatic representation.	
Practical No.	**Statistical Methods- 1 Practicals**	
1.2.1	Probability - I.	
1.2.2	Probability - II.	
1.2.3	Random Variable, Mean and Variance	
1.2.4	Bivariate Distribution and Correlation	
1.2.5	Binomial and Discrete Uniform Distributions	
1.2.6	Poisson Distribution	

Semester I
(Statistics-Generic)

Course Code: 23BUST1T05

CO1	Define the concepts of statistical population and sample, variables and attributes.	L1
CO2	Classify and represent the data in diagrams and graphs.	L2
CO3	Apply the formula and calculate descriptive measures of statistics.	L3
CO4	Analyze Statistical data using measures of central tendency and location.	L4

Grading will be as 3: High(>60%), 2: Moderate(40%-60%), 1: Low(<40%), 0: No mapping

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	**3**	**3**	**0**	**0**	**3**	**0**
CO2	**2**	**2**	**3**	**0**	**3**	**0**
CO3	**1**	**3**	**1**	**0**	**2**	**0**
CO4	**1**	**2**	**1**	**0**	**1**	**0**

Course Code	**Course Title**	**Credits**	**No. of hours**
23BUST1T05	**Basics of Statistics I**	**2**	

Unit I :	**<u>History of Science:</u>** Introduction: General History of Statistics, Aim and Scope of Statistics. Contributions of following Scientists in the field of Statistics: 1. Calyampudi Radhakrishna Rao (C.R.Rao). 2. Prasanta Chandra Mahalanobis (P.C. Mahalanobis). 3. Ronald Aylmer Fisher (R.A. Fisher) 4. Karl Pearson. **<u>Types of data</u>**: Qualitative and Quantitative data, Discrete and Continuous data. **<u>Collection of Data</u>**: Concept of population and sample, Finite and Infinite population. Primary data, Concepts of Questionnaire and a schedule, Secondary data.	**15**
Unit II :	**<u>Classification and Data Presentation:</u>** Frequency distribution of univariate and bivariate random variables. Graphical representation of frequency distribution by Histogram, Diagrammatic representation using Bar diagrams and Pie Chart. **<u>Measures of Central Tendency:</u>** Concept of central tendency of data. (Arithmetic averages, Location averages: Median, Mode, and Partition Values: Quartiles, Deciles, and Percentiles).	**15**

References and books:

1. Gupta S.C., Kapoor V. K. (2014): *Fundamentals of Mathematical Statistics*; Eleventh Edition; Sultan Chand & Sons.
2. Mood, A.M., Graybill, F.A. & Boes, D.C. (1974): *Introduction to the Theory of Statistics.* 3rd ed. New York: McGraw-Hill.
3. Rohatgi, V.K. & Saleh, A.K.M.E. (2015): *An Introduction to Probability and Statistics*. 3rd ed. Hoboken, NJ: John Wiley & Sons.
4. Gupta, S. C. and Kapoor, V. K. (2014), *Fundamentals of Applied Statistics*, Fourth Edition, Sultan Chand and Sons Publishers, New Delhi
5. C.R. Kothari (2023): Research Methodology: Methods and Techniques, New Age International Pvt Ltd Publishers

Semester I
Vocational Skill Enhancement (VSC)

Course Code: 23BU1VSC01

CO1	Demonstrate a thorough understanding of spreadsheet fundamentals, including managing workbooks and worksheets, and efficiently navigating between multiple sheets and workbooks and basic functions of worksheet.	L2
CO2	Explain built-in functions and create diagrammatic and graphical representations to analyze and visualize data effectively	L2

Grading will be as 3: High(>60%), 2: Moderate(40%-60%), 1: Low(<40%), 0: No mapping

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	**2**	**2**	**1**	**0**	**0**	**0**
CO2	**2**	**2**	**1**	**0**	**0**	**0**

Course Code 23BU1VSC01	**Course Title ADVANCED SPREADSHEETS TOOLS**	**Credit 1**	**No. of hours**
Unit I :	**INTRODUCTION TO SPREADSHEETS** Spreadsheets: Concept of worksheets and workbooks, creating, opening, closing and saving workbooks, moving, copying, inserting, deleting and renaming worksheets, working with multiple worksheets and multiple workbooks, controlling worksheet views, naming cells using name box, name create and name define; Exchanging data using clipboard, object linking and embedding. Printing and Protecting worksheets: Adjusting margins, creating headers and footers, Built in functions, text functions , Logical Functions, Information Functions, Date and Time Functions, Lookup and Reference Functions, Math and Trig Functions, Statistical Functions, Database Functions, Financial Functions, Engineering Functions, Cube Functions, Formulas vs. Excel Functions. Diagrammatic Representation: Bar Chart, Line Chart, Subdivided Bar, Chart Joint or Multiple Bar Charts, Percentage Bar Diagram and Pie Chart Scatter Diagram. Graphical Representation: Histogram Frequency Polygon/Curve Cumulative Frequency Curve or Ogive Curve.		**15**

CO3	Apply basic spreadsheet functions, efficiently manage workbooks and worksheets, and navigate between multiple sheets and workbooks to organize and process data effectively.	L3
CO4	Analyze data using built-in functions and generate diagrammatic and graphical representations to solve real-world data analysis and visualization problems.	L4

Grading will be as 3: High(>60%), 2: Moderate(40%-60%), 1: Low(<40%), 0: No mapping

	PO1	PO2	PO3	PO4	PO5	PO6
CO3	**2**	**2**	**1**	**0**	**0**	**0**
CO4	**2**	**2**	**1**	**0**	**0**	**0**

Course Code **23BU1VSC01**	**Course Title** **Practical Based on Advanced Spreadsheets Tools**	**Credit** **1**
Practical No.	**Advanced Spreadsheets Tools Practical's**	
1.3.1	Worksheet and Workbook	
1.3.2	Built in Function	
1.3.3	Diagrammatic Representation	
1.3.4	Graphical Representation	

Books and References:

1. Swinford, E., Dodge, M., Couch, A., & Melton, M. (2013). *Microsoft Office Professional 2013*. O'Reilly Media.
2. Wang, W. (2018). *Office 2019 for Dummies*. Pearson Education.
3. Jelen, B. (2013). *Excel 2013 Charts & Graphs*. Que.
4. Alexander, M., & Jelen, B. (2013). *Excel 2013 Pivot Table Data Crunching*. Pearson Education.
5. Alexander, M., & Kusleika, R. (2018). *Access 2019 Bible*. Wiley.
6. Kore, B.G. *M.S. Excel for Data Analysis*. Nirali Prakashan.

Semester II
(Statistics)

Semester II
(Statistics Major)
Course Code: 23BUST2T01

CO1	Explain the concepts of dispersion in data	L2
CO2	Interpret the basic properties of data like skewness and kurtosis	L2
CO3	Explain the concept of correlation between two variables	L2
CO4	Apply regression techniques to any data	L3

Grading will be as 3: High (>60%), 2: Moderate(40%-60%), 1: Low(<40%), 0: No mapping

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	**2**	**2**	**0**	**0**	**1**	**0**
CO2	**2**	**3**	**2**	**0**	**1**	**0**
CO3	**2**	**2**	**1**	**0**	**1**	**0**
CO4	**2**	**3**	**1**	**0**	**1**	**0**

Course Code 23BUST2T01	Course Title Descriptive Statistics – II	Credits 2	No. of in hours
Unit I :	**Measures of Dispersion, Skewness & Kurtosis:** **Concept of Dispersion**: Concept of dispersion. Requirements of good measure. Absolute and Relative measures of dispersion: Range, Quartile Deviation, Mean absolute deviation, Standard deviation. Variance and Combined variance, Raw and central moments up to fourth order and relations between them (with proof). Their properties. **Concept of Skewness and Kurtosis:** Measures of Skewness, Karl Pearson's, and Bowley's Coefficient of Skewness based on moments. Measure of Kurtosis, Box- Whisker Plot.		**15**
Unit II :	**Correlation and Regression Analysis:** **Correlation:** Scatter Diagram, Product moment correlation coefficient and its properties. Spearman's Rank correlation (With and without ties). **Regression Analysis:** Concept of linear regression. Principle of least squares. Fitting a straight line by method of least squares. Relation between Regression coefficients and Correlation Coefficient. **Fitting of Curves**: Fitting of curves reducible to linear form by transformation. Concept and use of coefficient of determination (R^2). Fitting a quadratic curve by method of least squares.		**15**

Reference and Books:

1. Agarwal B.L. (1978). Basic Statistics: New Age International Ltd.
2. Goon A.M., Gupta M.K.& Dasgupta B. (1968). Fundamentals of Statistics, Volume II: The World Press Private Limited, Calcutta.
3. Gupta S.C.& Kapoor V.K. (2007). Fundamentals of Mathematical Statistics: Sultan Chand & Sons
4. Gupta S.C.& Kapoor V.K. (2014). Fundamentals of Applied Statistics: Sultan Chand & Sons
5. Kothari C.R. (1985). Research Methodology: Wiley Eastern Limited.
6. Medhi, J. (2013). Statistical Methods, An Introductory Text. Second Edition: New Age International Ltd.

Course Code: 23BUST2T02

CO1	Explain continuous random variables.	L2
CO2	Evaluate mean, variance, moments of continuous random variables.	L5
CO3	Identify various continuous probability distributions.	L3
CO4	Solve real life problems by various continuous probability distributions and central limit theorem.	L6

Grading will be as 3: High(>60%), 2: Moderate(40%-60%), 1: Low(<40%), 0: No mapping

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	**3**	**2**	**0**	**0**	**0**	**0**
CO2	**3**	**3**	**2**	**0**	**0**	**2**
CO3	**3**	**3**	**0**	**0**	**0**	**2**
CO4	**3**	**3**	**2**	**0**	**3**	**2**

Course Code **23BUST2T02**	**Course Title** **Statistical Methods - II**	**Credits** **2**	**No. of hours**
Unit I :	**<u>Continuous random variable :</u>** **Basic concepts of continuous random variable.** Concept of Continuous random variable and properties of its Probability Density Function and Cumulative Distribution Function and their graphical representation. Expectation and variance of a random variable and its properties. Measures of location, dispersion, skewness and kurtosis. Raw and Central moments (simple illustrations).		**15**

Unit II :	**Continuous Probability Distributions:** Uniform Distribution, Exponential Distribution, Memory less property of Exponential Distribution and Normal Distribution Derivations of mean, median and variance for Uniform and Exponential distributions. Properties of Normal distribution and Normal Curve (without proof). Normal approximation to Binomial and Poisson distribution (statement only). Use of normal tables.	**15**

Reference Books:

1. Hogg R.V., Tannis E. A. (2014): *Probability and Statistical Inference*, Nineth Edition; Collier McMillan Publishers.
2. Arora Sanjay and BansiLal (1989) : *New Mathematical Statistics*, SatyaPrakashan, New Market, New Delhi,5
3. Gupta S.C., Kapoor V. K. (2014): *Fundamentals of Mathematical Statistics*; Eleventh Edition; Sultan Chand & Sons.
4. Mood, A.M., Graybill, F.A. & Boes, D.C. (1974): *Introduction to the Theory of Statistics.* 3rd ed. New York: McGraw-Hill.
5. Rohatgi, V.K. & Saleh, A.K.M.E. (2015): *An Introduction to Probability and Statistics*. 3rd ed. Hoboken, NJ: John Wiley & Sons.
6. Gupta, S. C. and Kapoor, V. K. (2014), *Fundamentals of Applied Statistics*, Fourth Edition, Sultan Chand and Sons Publishers, New Delhi

Course Code: 23BUST2P01

CO1	Evaluate and compare variations, in the data sets using various measures like Quartile deviation, variance, coefficient of variation, etc.	L2
CO2	Identify correlation between two variables and develop regression models.	L5
CO3	Evaluate mean, variance, moments of continuous random variables using R-software as well as scientific calculator.	L5
CO4	Solve various problems based on continuous probability distributions and central limit theorem using R- software as well as scientific calculator.	L6

Grading will be as 3: High(>60%), 2: Moderate(40%-60%), 1: Low(<40%), 0: No mapping

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	**4**	**3**	**3**	**0**	**2**	**1**
CO2	**4**	**3**	**3**	**0**	**2**	**1**
CO3	**3**	**3**	**3**	**0**	**2**	**2**
CO4	**3**	**3**	**3**	**0**	**2**	**2**

Course Code 23BUST2P01	Course Title **Practical Based on 23BUST2T01 & 23BUST2T02**	Credits 2
Practical No.	**Descriptive Statistics - II Practicals**	
2.1.1	Measures of Dispersion.	
2.1.2	Measures of Skewness	
2.1.3	Measures of Kurtosis	
2.1.4	Correlation analysis.	
2.1.5	Regression analysis.	
2.1.6	Fitting of curve.	
2.1.7	Practical using R Correlation analysis and Regression analysis.	
Practical No.	**Statistical Methods – II Practicals**	
2.2.1	Continuous Random Variables I.	
2.2.2	Continuous Random Variables II.	
2.2.3	Uniform and Exponential Distributions.	
2.2.4	Normal Distributions I.	
2.2.5	Normal Distributions II.	
2.2.6	Practical's Using R Continuous Distributions.	

Semester II
(Statistics-Minor)

Course Code: 23BUST2T03

CO1	Explain the concepts of dispersion in data	L2
CO2	Interpret the basic properties of data like skewness and kurtosis	L2
CO3	Explain the concept of correlation between two variables	L2
CO4	Apply regression techniques to any data	L3

Grading will be as 3: High(>60%), 2: Moderate(40%-60%), 1: Low(<40%), 0: No mapping

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	**3**	**2**	**0**	**0**	**0**	**0**
CO2	**3**	**3**	**2**	**0**	**0**	**2**
CO3	**3**	**3**	**0**	**0**	**0**	**2**
CO4	**3**	**3**	**2**	**0**	**3**	**2**

Course Code	**Course Title**	**Credits**	**No. of hours**
23BUST2T03	**Descriptive Statistics – II**	**2**	
Unit I :	**Measures of Dispersion, Skewness & Kurtosis:** **Concept of Dispersion**: Concept of dispersion. Requirements of good measure. Absolute and Relative measures of dispersion: Range, Quartile Deviation, Mean absolute deviation, Standard deviation. Variance and Combined variance, Raw and central moments up to fourth order and relations between them (with proof). Their properties. **Concept of Skewness and Kurtosis:** Measures of Skewness, Karl Pearson's, and Bowley's Coefficient of Skewness based on moments. Measure of Kurtosis, Box- Whisker Plot.		**15**
Unit II :	**Correlation and Regression Analysis:** **Correlation:** Scatter Diagram, Product moment correlation coefficient and its properties. Spearman's Rank correlation (With and without ties). **Regression Analysis:** Concept of linear regression. Principle of least squares. Fitting a straight line by method of least squares. Relation between Regression coefficients and Correlation Coefficient. **Fitting of Curves**: Fitting of curves reducible to linear form by transformation. Concept and use of coefficient of determination (R^2). Fitting a quadratic curve by method of least squares.		**15**

Reference and Books:

1. Gupta S.C.& Kapoor V.K. (2007). Fundamentals of Mathematical Statistics: Sultan Chand & Sons
2. Goon A.M., Gupta M.K.& Dasgupta B. (1968). Fundamentals of Statistics, Volume II: The World Press Private Limited, Calcutta.
3. Agarwal B.L. (1978). Basic Statistics: New Age International Ltd.
4. Gupta S.C.& Kapoor V.K. (2014). Fundamentals of Applied Statistics: Sultan Chand & Sons
5. Kothari C.R. (1985). Research Methodology: Wiley Eastern Limited.
6. Medhi, J. (2013). Statistical Methods, An Introductory Text. Second Edition: New Age International Ltd.

Course Code: 23BUST2T04

CO1	Explain continuous random variables.	L2
CO2	Evaluate mean, variance, moments of continuous random variables.	L5
CO3	Identify various continuous probability distributions.	L3
CO4	Solve real life problems by various continuous probability distributions and central limit theorem.	L6

Grading will be as 3: High(>60%), 2: Moderate(40%-60%), 1: Low(<40%), 0: No mapping

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	**3**	**2**	**0**	**0**	**0**	**0**
CO2	**3**	**3**	**2**	**0**	**0**	**2**
CO3	**3**	**3**	**0**	**0**	**0**	**2**
CO4	**3**	**3**	**2**	**0**	**3**	**2**

Course Code 23BUST2T04	**Course Title** Statistical Methods - II	**Credits** 2	**No. of hours**
Unit I :	**Continuous random variable :** **Basic concepts of continuous random variable.** Concept of Continuous random variable and properties of its Probability Density Function and Cumulative Distribution Function and their graphical representation. Expectation and variance of a random variable and its properties. Measures of location, dispersion, skewness and kurtosis. Raw and Central moments (simple illustrations).		**15**

Unit II :	**Continuous Probability Distributions:** Uniform Distribution, Exponential Distribution, Memory less property of Exponential Distribution and Normal Distribution Derivations of mean, median and variance for Uniform and Exponential distributions. Properties of Normal distribution and Normal Curve (without proof). Normal approximation to Binomial and Poisson distribution (statement only). Use of normal tables.	**15**

Reference Books:

1. Hogg R.V., Tannis E. A.(2014): *Probability and Statistical Inference*, Nineth Edition; Collier McMillan Publishers.
2. Arora Sanjay and BansiLal (1989) : *New Mathematical Statistics*, SatyaPrakashan, New Market, New Delhi,5
3. Gupta S.C., Kapoor V. K. (2014): *Fundamentals of Mathematical Statistics*; Eleventh Edition; Sultan Chand & Sons.
4. Mood, A.M., Graybill, F.A. & Boes, D.C. (1974): *Introduction to the Theory of Statistics.* 3rd ed. New York: McGraw-Hill.
5. Rohatgi, V.K. & Saleh, A.K.M.E. (2015): *An Introduction to Probability and Statistics*. 3rd ed. Hoboken, NJ: John Wiley & Sons.
6. Gupta, S. C. and Kapoor, V. K. (2014), *Fundamentals of Applied Statistics*, Fourth Edition, Sultan Chand and Sons Publishers, New Delhi

Course Code: 23BUST2P02

CO1	Evaluate and compare variations , in the data sets using various measures like Quartile deviation, variance, coefficient of variation, etc.	L2
CO2	Identify correlation between two variables and develop regression models.	L5
CO3	Evaluate mean, variance, moments of continuous random variables using R-software as well as scientific calculator.	L5
CO4	Solve various problems based on continuous probability distributions and central limit theorem using R- software as well as scientific calculator.	L6

Grading will be as 3: High(>60%), 2: Moderate(40%-60%), 1: Low(<40%), 0: No mapping

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	**4**	**3**	**3**	**0**	**2**	**1**
CO2	**4**	**3**	**3**	**0**	**2**	**1**
CO3	**3**	**3**	**3**	**0**	**2**	**2**
CO4	**3**	**3**	**3**	**0**	**2**	**2**

Course Code 23BUST2P02	Course Title **Practical Based on 23BUST2T03 & 23BUST2T04**	Credits 2
Practical No.	**Descriptive Statistics - 2 Practicals**	
2.1.1	Measures of Dispersion.	
2.1.2	Measures of Skewness	
2.1.3	Measures of Kurtosis	
2.1.4	Correlation analysis.	
2.1.5	Regression analysis.	
2.1.6	Fitting of curve.	
2.1.7	Practical using R Correlation analysis and Regression analysis.	
Practical No.	**Statistical Methods – 2 Practicals**	
2.2.1	Continuous Random Variables.	
2.2.2	Expectation and variance of a random variable and its properties.	
2.2.3	Uniform and Exponential Distributions.	
2.2.4	Normal Distributions.	
2.2.5	Applications of Central Limit Theorem and Normal Approximation.	
2.2.6	Practical's Using R Continuous Distributions.	

Semester II
(Statistics - Generic)

Course Code: 23BUST2T05

CO1	Apply the formula and calculate the descriptive measures of dispersion.	L3
CO2	Interpret the correlation between interrelated variables.	L5
CO3	Evaluate the probabilities using classical, statistical and axiomatic approach.	L5
CO4	Gain the knowledge about conditional probability and applications of Bayes' theorem.	L5

Grading will be as 3: High(>60%), 2: Moderate(40%-60%), 1: Low(<40%), 0: No mapping

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	**2**	**3**	**2**	**0**	**2**	**0**
CO2	**3**	**2**	**1**	**0**	**2**	**0**
CO3	**2**	**2**	**1**	**0**	**2**	**0**
CO4	**1**	**3**	**1**	**0**	**2**	**0**

Course Code	**Course Title**	**Credits**	**No. of hours**
23BUST2T05	**Basics of Statistics II**	**2**	
Unit I :	**Concept of Dispersion:** Concept of dispersion. Absolute and Relative measures of dispersion: (Range, Standard deviation). Variance and Combined variance, their properties. **Concept of Skewness and Kurtosis:** Measures of Skewness, Karl Pearson's, and Bowley's Coefficient of Skewness based on moments. Measure of Kurtosis. **Correlation Analysis:** Scatter Diagram, Product moment correlation coefficient and its properties. Spearman's Rank correlation.		**15**
Unit II :	**Elementary Probability Theory :** Trial, Random experiment, Sample point and Sample Space. Definition of an event. Operation of events, Mutually exclusive and exhaustive events. Classical (Mathematical) and Empirical and Axiomatic definitions of Probability and their properties. Theorems on Addition and Multiplication of probabilities and Independence of 2 events. Conditional probability, Baye's theorem (without proof) and its applications.		**15**

References and books:

1. Gupta S.C., Kapoor V. K. (2014): *Fundamentals of Mathematical Statistics*; Eleventh Edition; Sultan Chand & Sons.
2. Mood, A.M., Graybill, F.A. & Boes, D.C. (1974): *Introduction to the Theory of Statistics.* 3rd ed. New York: McGraw-Hill.
3. Rohatgi, V.K. & Saleh, A.K.M.E. (2015): *An Introduction to Probability and Statistics*. 3rd ed. Hoboken, NJ: John Wiley & Sons.
4. Gupta, S. C. and Kapoor, V. K. (2014), *Fundamentals of Applied Statistics*, Fourth Edition, Sultan Chand and Sons Publishers, New Delhi
5. C.R. Kothari (2023): Research Methodology: Methods and Techniques, New Age International Pvt Ltd Publishers

Semester II
(Statistics)
Vocational Skill Enhancement (VSC)

Course Code: 23BU2VSC01

CO1	Demonstrate the concepts of dimensions and measures in dataset visualization and Apply visualizations tools.	L2
CO2	Explain calculated fields, parameters, and Level of Detail (LOD) expressions, enabling tailored and flexible analysis for dashboards.	L2

Grading will be as 3: High (>60%), 2: Moderate (40%-60%), 1: Low(<40%), 0: No mapping

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	**3**	**2**	**1**	**0**	**0**	**0**
CO2	**3**	**2**	**1**	**0**	**0**	**0**

Course Code 23BU2VSC01	**Course Title Tableau**	**Credits 2**	**No. of hours**
Unit Is:	**Visualizations And Calculations:** Introduction to Dimensions and Measures, Bar Chart, Line Chart, Table, Heat Map. Treemap, Packed Bubble, Tooltip Calculated Fields, Parameters, Introduction to Level of Detail (LOD) FINAL DASHBOARD- Animations, Tooltips, Dashboard and Stories		**15**

CO3	Apply the concepts of dimensions and measures, along with different charts, in dataset visualization.	L3
CO4	Create dynamic dashboards with calculated fields, parameters, and Level of Detail (LOD) expressions, enabling tailored and flexible analysis.	L6

Grading will be as 3: High (>60%), 2: Moderate (40%-60%), 1: Low(<40%), 0: No mapping

	PO1	PO2	PO3	PO4	PO5	PO6
CO3	**3**	**2**	**1**	**0**	**0**	**0**
CO4	**3**	**2**	**1**	**0**	**0**	**0**

Course Code 23BU1VSC01	**Course Title** **Practical Based on Tableau**	**Credits 2**
Practical No.	**Advanced Spreadsheets Tools Practical's**	
1.3.1	Charts using Tableau	
1.3.2	Heat Map, Treemap and Packed Bubble	
1.3.3	Calculated Fields and Parameter	
1.3.4	Level of Detail and Dashboard	

Books and References:

1. Murray, D. G., Wexler, S., Shaffer, J., & Cotgreave, A. (Year). *Tableau Your Data! Fast and Easy Visual Analysis with Tableau Software*. Wiley.
2. Wexler, S., Shaffer, J., & Cotgreave, A. (Year). *The Big Book of Dashboards: Visualizing Your Data Using Real World Business Scenarios*. Wiley.
3. Sleeper, R. (Year). *Practical Tableau*. Wiley.
4. Knaflic, C. N. (Year). *Storytelling with Data: A Data Visualization Guide for Business Professionals*. Wiley.

VPM's B.N. Bandodkar College of Science (Autonomous), Thane

Curriculum Structure for the Undergraduate Degree Programme F.Y.B.Sc Statistics

	SEMESTER – I	**Course imparts Employability (EM), Entrepreneurship (EN), Skill Development (SD)**			**Course integrates with Professional Ethics (PE), Gender Equity (GE), Human Value (HV), Environmental Sustainability (ES)**			
Course Code	**Major Course Title**	**EM**	**EN**	**SD**	**PE**	**GE**	**HV**	**ES**
23BUST1T01	Descriptive Statistics – I	--	--	√	--	--	--	--
23BUST1T02	Statistical Methods – I	--	--	√	--	--	--	--
23BUST1P01	Practical Based on 23BUST1T01 & 23BUSTT02	√	√	√	--	--	--	--
	Minor Course Title							
23BUST1T03	Descriptive Statistics – I	--	--	√	--	--	--	--
23BUST1T04	Statistical Methods - I	--	--	√	--	--	--	--
23BUST1P02	Practical Based on 23BUST1T03 & 23BUSTT04	√	√	√	--	--	--	--
	Generic - Course Title							
23BUST1T05	Basics of Statistics -I	--	--	√	--	--	--	--
	Vocational Skill Enhancement (VSC)							
23BU1VSC01	Advanced Spreadsheets Tools	√	√	√	--	--	--	--
	Total	**03**	**03**	**08**	**00**	**00**	**00**	**00**

	SEMESTER – II	Course imparts Employability (EM), Entrepreneurship (EN), Skill Development (SD)			Course integrates with Professional Ethics (PE), Gender Equity (GE), Human Value (HV), Environmental Sustainability (ES)			
Course Code	**Major Course Title**	**EM**	**EN**	**SD**	**PE**	**GE**	**HV**	**ES**
23BUST2T01	Descriptive Statistics – II	--	--	√	--	--	--	--
23BUST2T02	Statistical Methods – II	--	--	√	--	--	--	--
23BUST2P01	Practical Based on 23BUST1T01 & 23BUSTT02	√	√	√	--	--	--	--
	Minor Course Title							
23BUST2T03	Descriptive Statistics – II	--	--	√	--	--	--	--
23BUST2T04	Statistical Methods – II	--	--	√	--	--	--	--
23BUST2P02	Practical Based on 23BUST1T03 & 23BUSTT04	√	√	√	--	--	--	--
	Generic - Course Title							
23BUST2T05	Basics of Statistics -II	--	--	√	--	--	--	--
	Vocational Skill Enhancement (VSC)							
23BU2VSC01	Tableau	√	√	√	--	--	--	--
	Total	**03**	**03**	**08**	**00**	**00**	**00**	**00**