To be effective from June 2023

B. A.(MINOR)
SEMESTER – I
STATISTICS - I
COURSE CODE – STAT MI 101
CREDIT MARK DISTRIBUTION – 03

COURSE OBJECTIVES

- To get the idea of data and its various types.
- To get the knowledge of various methods of collecting data.
- To understand the meaning and usefulness of classification and tabulation.
- To know about various terminologies used in learning basic statistics, to prepare frequency distribution tables according to nature of data.
- To learn the technique of representing data in pictorial form by means of various types of graphs such as- Bar diagram,Histogram, frequency polygon, frequency curve and cumulative frequency curve and deriving some of the measures of central tendency from graphs.

PRE – REQUISITE:

Actually to learn this module no much detailed knowledge of Statistics or Mathematics is needed.

CO – REQUISITE

The knowledge of mathematics up to higher school level will help to learn the topics faster.

COURSE OUTCOMES

Upon successful completion of this course, learner will

- Understand the meaning and importance of Statistics in research.
- Become able to apply the data collection methods and will be capable to carryout various surveys independently.
- Learn to classify the data, will be able to interpret the classified data and will become capable to present the data in graphical form.

UNIT	CONTENT	WEIGHTAGE
1	**Statistics** ➢ History of Statistics ➢ Meaning and Definitions of Statistics ➢ Uses and Characteristics of Statistics ➢ Advantages and Disadvantages of Statistics	**25%**
2	**Primary and Secondary data.** ➢ Concept of Primary and Secondary data. ➢ Methods of collecting primary data: Direct investigation, Indirectinvestigation.Investigationthrough correspondents, Formation of questionnaire and collection of data through mail using tool of questionnaires. ➢ Sources of Secondary data.	**25%**
3	**Classification and Tabulation** ➢ Concept of Classification. ➢ Various terminologies as a prerequisites of studying Classification such as variable, constant, Class intervals, Exclusive and Inclusive classes, Range, frequency, Cumulative frequencies etc. ➢ Types and importance of Classification. ➢ Examples of Classification.	**25%**
4	**Graphs and Diagrams:** ➢ Representation of statistical data through -(1) Bar diagrams (2) Histogram (3) Frequency polygon (4) Frequency curve (4) Less than type and Greater than type cumulative frequency curves (Ogive curves). ➢ To obtain various possible measures of central tendency such as- Median, Mode, Quartiles, Deciles and Percentiles from the relevant graphs stated above. ➢ Simple examples.	**25%**

MODE OF EVALUATION:

Evaluation will be divided in two parts.

- **External:** Semester end Examination will be conducted by the Gujarat University of 70 Marks
- **Internal:** Internal Evaluation of 30 marks will be decided by the colleges / Institutes/ University departments as per the instruction given by the University time to time.

REFERENCE BOOKS:

1. D. S. Sancheti& V. K. Kapoor: Statistics: Theory, Method & Application, Sultan Chand & Sons, New Delhi.
2. Anderson, Sweeney, Williams, camm and Cochran(2015): Statistics for Businees and Economics, 13e, Cengage Learning.

B. A. (MULTI-DISCIPLINARY) To be effective from June 2023

SEMESTER – I

STATISTICS - I

COURSE CODE – STAT MD 101

CREDIT MARK DISTRIBUTION – 03

COURSE OBJECTIVES

- To get the idea of data and its various types.
- To get the knowledge of various methods of collecting data.
- To understand the meaning and usefulness of classification and tabulation.
- To know about various terminologies used in learning basic statistics, to prepare frequency distribution tables according to nature of data.
- Students will gain an understanding of concepts of basic descriptive statistics and will learn to calculate various descriptive measures of statistics.
- Students will become capable to carryout comparative study in more scientific ways.

PRE – REQUISITE:

- The learners should have basic knowledge of mathematics up to higher school level.

CO – REQUISITE :

- The learner should have basic knowledge of Algebra.

COURSE OUTCOMES

Upon successful completion of this course, students will:

- Understand the meaning and importance of Statistics in research.
- Become able to apply the data collection methods and will be capable to carryout various surveys independently.
- Learn to classify the data, will be able to interpret the classified data
- Learn the use of various measures of central tendency and dispersion.
- Analyze and interpret the result of various measures of central tendency and measure of dispersion.

- Learn the use of various measures of central tendency and dispersion.
- Be able to analyze and interpret the results of various measures of central tendency and dispersion.

UNIT	CONTENT	WEIGHTAGE
1	**Primary and Secondary data.** ➢ Concept of Primary and Secondary data. ➢ Methods of collecting primary data: Direct investigation, Indirectinvestigation. Investigation through correspondents, Formation of questionnaire and collection of data through mail using tool of questionnaires. ➢ Sources of Secondary data.	**25%**
2	**Classification and Tabulation** ➢ Concept of Classification. ➢ Various terminologies as a prerequisites of studying Classification such as variable, constant, Class intervals, Exclusive and Inclusive classes, Range, frequency, Cumulative frequencies etc. ➢ Types and importance of Classification. ➢ Examples of Classification.	**25%**
3	**Measure of Central Tendency - I** ➢ Definition of Measure of Central Tendency ➢ Various measure of central tendency: Arithmetic Mean, Median and Mode. Their merits and demerits. ➢ Examples based on these measures for grouped and ungrouped data. ➢ Combined Mean.	**25%**
4	**Measure of Central Tendency-II** ➢ Quartiles, Deciles and Percentiles. Their merits and demerits. ➢ Examples based on these measures for grouped and ungrouped data.	**25%**

MODE OF EVALUATION:

Evaluation will be divided in two parts.

- **External:** Semester end Examination will be conducted by the Gujarat University of 70 Marks
- **Internal:** Internal Evaluation of 30 marks will be decided by the colleges / Institutes/ University departments as per the instruction given by the University time to time.

REFERENCE BOOKS:

1**.** D. S. Sancheti & V. K. Kapoor: Statistics: Theory, Method & Application, Sultan Chand & Sons, New Delhi.

2. Anderson, Sweeney, Williams, camm and Cochran(2015): Statistics for Businees and Economics, 13e, Cengage Learning.

B. A.(MINOR) To be effective from June 2023

SEMESTER – I

STATISTICS - 2

COURSE CODE – STAT MI 102

CREDIT MARK DISTRIBUTION – 03

COURSE OBJECTIVES

- Gain a thorough understanding of applied principles of statistics.
- Lear the applications of Statistics in the field of demographic studies and market research.

RE – REQUISITE:

- The learners should have basic knowledge of statistics.

CO – REQUISITE

- The learner must have knowledge of basic arithmetic operations and basic algebra.

COURSE OUTCOMES

Upon successful completion of this course, students will:

- Be able to understand the methods introduced in this paper.
- Students will be equipped with the skills ofunderstanding, analyzing and interpreting the data of health and economics sectors. Also student will become capable of understanding the trends of time series data in equity market.

UNIT	CONTENT	WEIGHTAGE
1	**Population Census:** ➢ Background and Meaning of Population Census. ➢ Methods of population census and it uses. ➢ Study of India's population census. ➢ Limitations of population census.	**25%**

2	**Demographic Methods:** ➢ Meaning and scope of demography, uses of demographic statistics. ➢ Methods of collecting demographic statistics. ➢ Various measures of demographic studies. **Death rate**: Crude death rate (CDR.), Age Specified Death Rate (ASDR) and Standardized Death Rate (SDR.) Examples to find CDR, ASDR, SDR and to compare the health standards of two regions. ➢ Meaning of Infant Mortality Rate (I.M.R.). **Birth Rate**: Crude birth rate (CBR.). ➢ **Fertility Rate**: Meaning of fertility rate, General Fertility Rate (GFR.), Specific Fertility Rate (SFR.) and Total Fertility Rate (TFR.). Examples based on these measures.	**25%**
3	**Time Series:** ➢ Meaning of Time series. ➢ Various components of time series: Trend, Short term variations, Seasonal, Cyclic and Random components. ➢ Methods of measuring Trend: (a) Graphical Method (b) Method of Moving Averages, (c) Least squares method. ➢ Concept of principle of least squares. ➢ Calculation of short term variations. ➢ Fitting of straight line and obtain the **Linear**	**25%**

	Trend. ➢ Seasonal indices and simple examples to obtain seasonal indices.	
4	**Index Numbers:** ➢ Definition, Limitations and uses of Index numbers. ➢ Construction of wholesale price index number and cost of living index number. ➢ Construction of index number by Aggregate Expenditure method and Family Budget method. ➢ Calculation of Laspeyres, Paasches and Fisher's Index numbers.	**25%**

MODE OF EVALUATION:

Evaluation will be divided in two parts.

- **External:** Semester end Examination will be conducted by the Gujarat University of 70 Marks
- **Internal:** Internal Evaluation of 30 marks will be decided by the colleges / Institutes/ University departments as per the instruction given by the University time to time.

REFERENCE BOOKS:

1.S. C. Gupta & V. K. Kapoor: Fundamental of Applied Statistics, Sultan Chand & Sons, New Delhi.
2. Sancheti& Kapoor: Business Mathematics, "Sultan Chand & Sons, New Delhi.
3. S.C. Gupta and V.K. Kapoor (2007): Fundamentals of Mathematical Statistics, 11th Ed., Sultan Chand and Sons.
4. Anderson, Sweeney, Williams, camm and Cochran(2015): Statistics for Businees and Economics, 13e, Cengage Learning.

B. A. (MINOR) To be effective from June 2023

SEMESTER – II

STATISTICS - 3

COURSE CODE – STAT MI 201

CREDIT MARK DISTRIBUTION – 03

COURSE OBJECTIVES

- Students will gain an understanding of concepts of basic descriptive statistics and will learn to calculate various descriptive measures of statistics.
- Students will become capable to carryout comparative study in more scientific ways.

PRE – REQUISITE

The learners should have knowledge of mathematics up to higher school level to learn basic contents.

CO – REQUISITE

The learner should have basic knowledge of Algebra.

COURSE OUTCOMES:

Upon successful completion of this course, students will:

- Learn the use of various measures of central tendency, dispersion and skewness.
- Be able to analyze and interpret the results of various measures of central tendency, dispersion and skewness.
- Understand the importance of Statistical measures in verifying the normality of the data which is the essential and unavoidable prerequisite of analyzing the data, also students will become capable to do basic analysis of the numerical data and will become capable to carryout comparative studies in research.

UNIT	CONTENT	WEIGHTAGE
1	**Measure of Central Tendency - I** ➢ Definition of Measure of Central Tendency ➢ Various measure of central tendency: Arithmetic Mean, Median and Mode. Their merits and demerits. ➢ Examples based on these measures for grouped and ungrouped data. ➢ Combined Mean.	**25%**
2	**Measure of Central Tendency-II** ➢ Quartiles, Deciles and Percentiles. Their merits and demerits. ➢ Examples based on these measures for grouped and ungrouped data.	**25%**
3	**Measure of Dispersion** ➢ Meaning and definition of Dispersion. ➢ Various Measures of Dispersion: Range, Mean Deviation(MD),QuartileDeviation(QD), Standard Deviation(SD), Combined Standard deviation, Coefficient of Variations(CV). ➢ Simple examples to find various measures of dispersion using different methods for the grouped as well as ungrouped data.	**25%**
4	**Measure of Skewness** ➢ Meaning and definition of Skewness. ➢ Types of skewness, Coefficient of skewness. ➢ Measures of Skewness- Karl Pearson's and Bowley's method to measure the skewness.	**25%**

MODE OF EVALUATION:

Evaluation will be divided in two parts.

- **External:** Semester end Examination will be conducted by the Gujarat University of 70 Marks
- **Internal:** Internal Evaluation of 30 marks will be decided by the colleges / Institutes/ University departments as per the instruction given by the University time to time.

REFERENCE BOOKS:

1. D. S. Sancheti& V. K. Kapoor: Statistics: Theory, Method & Application, Sultan Chand & Sons, New Delhi.
2. Anderson, Sweeney, Williams, camm and Cochran(2015): Statistics for Businees and Economics, 13e, Cengage Learning.
3. S. P. Gupta and M. P. Gupta: Business Statistics.

B. A.(MINOR) To be effective from June 2023

SEMESTER – II

STATISTICS - 4

COURSE CODE – STAT MI 202

CREDIT MARK DISTRIBUTION – 03

COURSE OBJECTIVES

To develop student's ability to deal with numerical and quantitative techniques of mathematics which are the prior need for the studying the theory and applications of probability.

To develop the ability of students to carryout sample surveys using different sampling techniques in different situations.

PRE – REQUISITE:

The learner should have knowledge of basic principles of Mathematics.

CO – REQUISITE

Basic knowledge of topics of Statistics covered in the syllabus of previous semester will help the learner to boost the learning capacity of this paper.

COURSE OUTCOMES

Upon successful completion of this course, students will:

- Be able to develop their logical and numerical ability.
- Become eligible to study the problems of probability in subsequent semesters.
- Learn about the importance and constraints of sampling. They will also learn about the usage of appropriate sampling techniques according to the nature of data.
- Understand the basic sampling techniques and will become capable of doing surveys in the area of research.

UNIT	CONTENT	WEIGHTAGE
1	**Permutations** Basic idea of Permutations with illustrations. Formula for P_r^n (Without proof). Examples based on permutations.	**25%**
2	**Combinations** Basic idea of Combinations with illustrations. Formula for C_r^n (Without proof). Examples based on combinations.	**25%**
3	**Sampling Methods – I** Concept of Population survey and Sample survey, Characteristics of a good sample. The importance of size of a sample. Meaning of sampling (With replacement and without replacement). Concept of Simple random sampling and examples based on it.	**25%**
4	**Sampling Method – II** Stratified Random Sampling Method and simple numerical examples based on Stratified Random Sampling (up to 3 strata).	**25%**

MODE OF EVALUATION:

Evaluation will be divided in two parts.

- **External:** Semester end Examination will be conducted by the Gujarat University of 70 Marks
- **Internal:** Internal Evaluation of 30 marks will be decided by the colleges / Institutes/ University departments as per the instruction given by the University time to time.

REFERENCE BOOKS:

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

2. Sancheti& Kapoor: Business Mathematics, "Sultan Chand & Sons, New Delhi.

3. S.C. Gupta and V.K. Kapoor (2007): Fundamentals of Mathematical Statistics, 11th Ed., Sultan Chand and Sons.

4. Anderson, Sweeney, Williams, camm and Cochran(2015): Statistics for Businees and Economics, 13e, Cengage Learning.

B. A. (MULTI-DISCIPLINARY) To be effective from June 2023
SEMESTER – 2
STATISTICS - 2
COURSE CODE – STAT MD 201
CREDIT MARK DISTRIBUTION – 03

COURSE OBJECTIVES

- Gain a thorough understanding of Dispersion, Skewness, Correlation and Regression.
- Demonstrate the ability to summarize a technical report and/or statistical analysis and interpret results; also, show the ability for broader implication of application in the statistical field.

PRE – REQUISITE:

- The learners should have basic knowledge of statistics.

CO – REQUISITE

- The learner should able to calculate Mean, Quartiles and must have knowledge of basic algebra.

COURSE OUTCOMES

Upon successful completion of this course, students will:

- Learn the meaning and importance of measures of dispersion and skewness.Also they will learn how these measures play a crucial role in descriptive study of the data.
- Become capable to computevarious measure of dispersion and Skewness. Also theywill learn to interpret the resultsobtained through it.
- Learn the meaning of correlation and regression and their importance in forecasting.
- Learn the regression techniques to estimate the trend in the field of Market and Economics.

UNIT	CONTENT	WEIGHTAGE
1	**Measure of Dispersion** ➢ Meaning and definition of Dispersion. ➢ Various Measures of Dispersion-Range, Mean Deviation(MD), Quartile Deviation(QD), Standard Deviation(SD), Combined Standard deviation, Coefficient of Variations(CV). ➢ Simple examples to find various measures of dispersion by different methods for grouped and ungrouped data.	**25%**
2	**Measure of Skewness** ➢ Meaning and definition of Skewness. ➢ Types of skewness, Coefficient of skewness. ➢ Measure of Skewness- Karl Pearson's and Bowley's method to measure the skewness.	**25%**
3	**Correlation** ➢ Concept of linear correlation between two variables. ➢ Methods of Studying Correlation •Scatter diagram. •Karl person's formula for correlation coefficient. •Spearman's rank correlation. ➢ Calculation of correlation coefficient from ungrouped data only. ➢ Simple examples.	**25%**

4	**Regression** ➢ Concept of Regression. ➢ Regression Equations for two variables only. ➢ Principle of Least Squares (without derivation) ➢ Fitting of straight line using least squares method. ➢ Concept of error in regression. ➢ Coefficientof determination and its interpretation. ➢ Uses of regression in forecasting.	**25%**

MODE OF EVALUATION:

Evaluation will be divided in two parts.

- **External:** Semester end Examination will be conducted by the Gujarat University of 70 Marks
- **Internal:** Internal Evaluation of 30 marks will be decided by the colleges / Institutes/ University departments as per the instruction given by the University time to time.

REFERENCE BOOKS:

1.S. C. Gupta & V. K. Kapoor: Fundamental of Applied Statistics, Sultan Chand & Sons, New Delhi.
2. Sancheti & Kapoor: Business Mathematics, "Sultan Chand & Sons, New Delhi.
3. S.C. Gupta and V.K. Kapoor (2007): Fundamentals of Mathematical Statistics, 11th Ed., Sultan Chand and Sons.
4. Anderson, Sweeney, Williams, camm and Cochran(2015): Statistics for Business and Economics, 13e, Cengage Learning.