



**B. Sc. Statistics (Faculty of Science)**  
**First year Semester (I)**

Course Code	US01MISTA01	Title of the Course	DESCRIPTIVE STATISTICS FOR UNIVARIATE DATA
Total Credits of the Course	02	Hours per Week	02

Course Objectives:	<ol style="list-style-type: none"> <li>1. To understand the types of data in scientific and other fields</li> <li>2. To compute various measures of central tendency, dispersion, skewness and kurtosis with its merits and demerits and its usefulness in real life.</li> <li>3. To understand the concept of various partition values and its uses in real life.</li> </ol>
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Course Content		
Unit	Description	Weightage* (%)
I	Data Types : scale of measurements – nominal, ordinal, interval and ratio  <b>Analysis of Quantitative data – I</b>  Measures of central tendency : Mean, Median, Mode, Geometric mean Harmonic mean, Weighted mean, Combined mean with its merits and demerits, Properties (with proof), Examples  Partition values and their graphical representation	50%
II	<b>Analysis of Quantitative data - II</b>  Measures of Dispersion : Range, Quartile derivation, Mean Derivation, Standard derivation and Coefficient of variation(C.V) with its merits and demerits, Properties (with proof)  Box – and – whisker plot  Moments : Raw and central moments  Relationship between raw and central moments  Skewness, Kurtosis , Examples	50%

Teaching-Learning Methodology	Interactive Class Lectures, ICT Tools, hand on experience in problem solving through practical sessions.
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*(Signature)*  
 Head





Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Quantify the measures of central tendency (location), dispersion (spread), skewness and kurtosis (shape related) and relate them with data
2.	Calculate quantiles and relate it with different characteristics of data
3.	

Suggested Text Books/ References:	
Sr. No.	Text Books
1.	B. L. Agarwal (2003). Programmed STATISTICS (Questions – Answers). New Age International Publishers. Chap. 1-5.
2.	D. Bhattacharya and S. Roychowdhury (2019 reprint). STATISTICS, Theory and Practice, 3 <sup>rd</sup> Ed., U.N. Dhur & Sons Pvt. Ltd., Kolkata. Chap. 1-7.
3.	D. freedman, R. Pisani, R. Purves (2017 reprint). Statistics, 4 <sup>th</sup> Ed., Viva Books, Kolkata. Chap 3-4.
4.	Goon, A.M., Gupta, M. K. and Dasgupta, B. (2002). Fundamental of Statistics, Vol. I, 8 <sup>th</sup> Ed., The World Press, Kolkata. Chap. 4-9.
5.	B. L. Agarwal (2006). Basic Statistics, Revised 4 <sup>th</sup> Ed., New Age International Publishers. Chap. 18.
	Reference Books





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Syllabus with effect from the Academic Year 2023-2024

Course code	USO1MI STA02	Course	Statistics Practical-2
Total Credits of the Course	02	Hours per Week	04

Course Objectives:	<ol style="list-style-type: none"><li>1. Practicing to identify data types from the example/problem at hand from scientific and other fields</li><li>2. Practicing to summarize and derive tangible information contained in the scientific and other data</li></ol>
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**List of Practical**

Sr.	Task Using MS-EXCEL/ Manual
1	Tabulation of scientific data: Discrete and Continuous frequency table, Cumulative frequency table for attributes and variables
2	Diagrammatical presentation of scientific data: Pie chart, Bar chart
3	Graphical presentation of scientific data: frequency curve, histogram, frequency polygon
4	Measures of central tendency: mean by direct method, and with change of origin and scale, and for classified frequency tabulated scientific data
5	Measures of central tendency: quantiles (including median) by direct method, graphically and for classified frequency tabulated scientific data
6	Measures of central tendency: mode by direct method, graphically and for classified frequency tabulated scientific data
7	Measures of dispersion: quartile deviation by direct method, graphically and for classified frequency tabulated scientific data
8	Measures of dispersion: mean deviation, standard deviation, coefficient of variation by direct method, and with change of origin and scale and for classified frequency tabulated scientific data
9	Moments: raw, central, skewness and kurtosis based on moments
10	Box-Whisker plot of five data characteristics and outlier values

**REFERENCE MATERIAL**





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1.	Fred, Pyrczak (2017). SUCCESS at STATISTICS, A worksheet with Humor, 6 <sup>th</sup> Ed., Routledge, NY.
2.	Pal, N. And Sarkar, S. (2005). STATISTICS, Concepts and Applications, Prentice Hall of India, New Delhi.
3.	K.V.S. Sarma (2001). STATISTICS made Simple DO It Yourself on PC, Prentice Hall of India, New Delhi.
4.	B. L. Agarwal (2006). Basic Statistics, Revised 4 <sup>th</sup> Ed., New Age International Publishers. Chap. 18.
5.	Bilal, M. A. And Richard, H. M. (2015). Probability, Statistics, and reliability for Engineers and Scientists, 3 <sup>rd</sup> Ed. Special Indian Ed., (Chapter 1 &2), CRC Press.
6.	J. McClave and T. Sincich (2018). Statistics, 13 <sup>th</sup> Ed., Pearson, NY. Chap. 1-2.
7.	Pandian, C.R and Murali, K.S.K. (2015). Simple Statistical Methods for software Engineering: Data and patterns, (Section I) CRC Press. Chap. 1-4.

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Week	Topics
1	Data: quantitative and qualitative, attributes and variables, scales of measurement-nominal, ordinal, interval and ratio. Primary and Secondary Data.
2	Classification and tabulation of data: Sturges rule for deciding the number of classes.
3	Diagrammatical presentation of Qualitative data: Pie, Bar/Column, Cluster Bar charts
4	Graphical presentation of Quantitative data: Histogram, frequency polygon/curve, Ogive curve.
5	Measures of central tendency: mean, median, mode, geometric mean, harmonic mean for ungrouped data
6	Measures of central tendency (positional): quantiles: quartiles, deciles, percentiles for ungrouped data
7	Measures of central tendency: mean, median, mode, geometric mean, harmonic mean for grouped data
8	Measures of central tendency (positional): quantiles, quartiles, deciles, percentiles for grouped data
9	Measures of dispersion: range (crude measure), quartile deviation, absolute mean /median deviation from mean and median for ungrouped and grouped data
10	Measures of dispersion: variance, standard deviation and coefficient of variation for ungrouped and grouped data
11	Moments: raw, central for grouped data
12	Measures of skewness: concept, Bowley's and Pearson's coefficient of skewness and types of skewness's for grouped data, Measures of kurtosis: concept, computation and types of kurtoses for grouped data, Box-Whisker plot





**B. Sc. (Any B-group subject) (Faculty of Science)**  
**Skill Enhancement Course First year Semester (I)**

Course Code	US01SESTA01	Title of the Course	ELEMENTS OF BIOSTATISTICS
Total Credits of the Course	02	Hours per Week	02

Course Objectives:	<ol style="list-style-type: none"><li>1. To get acquaint with the core statistical terms and symbols</li><li>2. To become aware of the beginning and importance of Statistics in biological field</li><li>3. To be able to design data collection and make data presentation in the most appropriate forms</li></ol>
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Course Content		
Unit	Description	Weightage* (%)
I	Introduction of Biostatistics: Data Types and Data Collection Techniques: scales of measurements- nominal, ordinal, interval and ratio. Data Presentations (univariate and bivariate): tabular  Diagram and: Bar Diagram (Simple, Sub-divided and Multiple) and Pie chart.  Graphical representation Histogram, Frequency curve  Measures of central tendency: Mean, Median, Mode, Geometric Mean and Harmonic Mean.	50
II	Measures of Location: Quartiles, Deciles, Octiles and Percentiles.  Measures of Dispersion: Range, Mean Deviation, Deviance, Variance, and Standard Deviation. Coefficient of Variation.  Coefficient of skewness for asymmetry (skewness) and peakedness (kurtosis) Box-and-Whisker plot, Stem leaf chart.	50

Teaching-Learning Methodology	Interactive Class Lectures, ICT Tools, hand on experience in problem solving through practical sessions.
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*for* D. P. Rajkumari  
Head





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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to

1.	Comprehend reading material on biostatistics.
2.	Present original data in tabular, diagrammatical and graphical form based on the data types and characteristics in the data
3.	Calculate correlation and regression coefficient for data of 10 values. Relate it with the characteristics of data
4.	Calculate index numbers, vital statistics and interpret them

Suggested Text Books/ References:

Sr. No.	Text Books
1.	S. Prasad (2006). Elements of Biostatistics, 2 <sup>nd</sup> revised ed., Rastogi Publications, Meerut-250002.
2.	Irfan Ali Khan, Atiya Khanum, and Shiba Khan (2018). Fundamentals of Biostatistics, 5 <sup>th</sup> revised ed., Ukaaz Publications, Moosarambagh, Hyderabad-500036.
3.	Marcello Pagano and Kimerlee Gauvreau (2004). Principles of Biostaistics, 2 <sup>nd</sup> ed., Thompson Asia Pte. Ltd., Singapore.
4.	Wayne W. Daniel (2007). Biostatistics: A Foundation for Analysis in the Health Sciences, 7 <sup>th</sup> ed. John Wiley INDIA Student Edition.
5.	Shri G.C. Patel and G.K. Jani (2017). Basic Biostatistics for Pharmacy, 2 <sup>nd</sup> ed., Atul Prakashan, Gandhi Road, Ahmedabad.





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6.	B. L. Agarwal (2006). Basic Statistics, Revised 4 <sup>th</sup> Ed., New Age International Publishers. Chap. 18.

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*for*  
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