

## As Per NEP 2020

# University of Mumbai



<b>Syllabus for Basket of OE Vertical 3</b>	
<b>Faculty of Science</b>	
<b>Board of Studies in Statistics</b>	
<b>UG Second Year Programme</b>	
<b>Semester</b>	<b>IV</b>
<b>Title of Paper</b>	<b>Credits 2</b>
<b>I) Applied Statistics-I</b>	<b>2 credit</b>
<b>From the Academic Year</b>	<b>2025-26</b>

**Semester- IV**  
**Open Elective-II**  
**Name of the Course: Applied Statistics-I**

Sr.No.	Heading	Particulars
1	Description the course : Including but Not limited to:	<p><b>Introduction,</b></p> <p>Applied statistics is an open elective course designed for students who are enrolled in first year of under graduation. This course is useful for those who are studying the subjects which includes collection of real-life data, analysis, and interpretation in the Industrial, Financial, Engineering, Biological and among other fields.</p> <p>Applied Statistics course can equip students with the necessary skills to make data-driven decisions and advance their career in the fields of data science and applied statistics.</p> <p>There is growing demand for highly skilled statisticians in the 21st century in many fields including government, banking sector, health sciences, veterinary sciences, agricultural sciences, business, and social sciences etc.</p>
2	<b>Vertical :</b>	Open Elective
3	<b>Type :</b>	Theory
4	<b>Credits :</b>	2 credits ( 1 credit = 15 Hours for Theory in a semester )
5	<b>Hours Allotted :</b>	30 Hours
6	<b>Marks Allotted:</b>	50 Marks
7	<b>Course Objectives(CO):</b> (List the course objectives) <b>CO1:</b> Students will be able to,	<ul style="list-style-type: none"> <li>• Understand the meaning of statistics and scope of statistics.</li> <li>• Understand techniques of data collection and its presentation.</li> <li>• Compute various measures of central tendencies and measures of dispersion.</li> <li>• Summarize data through central tendencies and measures of dispersion.</li> <li>• Understand the behavior of data using skewness and kurtosis.</li> </ul>

8	<p><b>OC1: on successful completion of the course Students Should be able to,</b></p> <ul style="list-style-type: none"> <li>• Calculate arithmetic mean, Geometric mean and Harmonic Mean</li> <li>• Differentiate between qualitative and quantitative data through scale of measurement.</li> <li>• Construct graphs and diagrams from data and interpret the result.</li> <li>• Compute Skewness and Kurtosis of the data to describe nature of data distribution.</li> </ul>
9	<p><b>Modules:-</b></p> <p><b>UNIT I:</b></p> <ol style="list-style-type: none"> <li>1. Definition and scope of Statistics</li> <li>2. Types of Characteristics, Different types of scales: nominal, ordinal, interval, and ratio.</li> <li>3. Collection of Primary data: concept of a questionnaire and a schedule, Secondary data</li> <li>4. Types of data: Qualitative and quantitative data; Time series data and cross section data, discrete and continuous data.</li> <li>5. Tabulation.</li> <li>6. Univariate frequency distribution of discrete and continuous variables. Cumulative frequency distribution.</li> <li>7. Graphical representation of frequency distribution by Histogram, frequency polygon, Cumulative frequency curve.</li> </ol> <p><b>UNIT II:</b></p> <ol style="list-style-type: none"> <li>i. Measures of Central Tendency Definitions and Applications of Arithmetic mean. Geometric mean, Harmonic mean, relation between Geometric mean, Harmonic mean. Arithmetic mean, Positional Averages (Median, quartiles, deciles, and percentiles), and mode, with simple examples and no any derivation. Merits and demerits of central tendency.</li> <li>ii. Absolute and Relative measures of dispersion: Range, Quartile Deviation, Mean absolute deviation, Standard deviation, Coefficient of variation, Variance and Combined variance, Raw moments and central moments, relation between them and their properties. Merits and Demerits of measures of dispersion.</li> </ol>
	<p><b>UNIT III:</b></p>
	<ol style="list-style-type: none"> <li>i. Random variable: discrete random variables. Definition and properties of probability mass function. cumulative distribution function.</li> <li>ii. Joint probability mass function of two discrete random variables.</li> <li>iii. Marginal and conditional distributions.</li> <li>iv. Definition and their mean and variance of the following</li> </ol>

distributions:

- a. Discrete Uniform distribution
- b. Bernoulli and Binomial distributions
- c. Poisson distribution

**References.**

1. Agarwal B.L. : Basic Statistics, New Age International Ltd.
2. Spiegel M.R. : Theory and Problems of Statistics, Schaum' s Publications series.Tata McGraw-Hill.
3. Kothari C.R. : Research Methodology, Wiley Eastern Limited.
4. Goon A.M., Gupta M.K., Dasgupta B. : Fundamentals of Statistics, Volume II :The World Press Private Limited, Calcutta.
5. Elhance D. N, Elhance V, Aggarwal B. M, Fundamentals of Statistics, Kitab Mahal Daryaganaj New Delhi, 2018.
6. Grewal P. S, Methods of Statistical Analysis, Sterling Publishers, 1990
7. S.C. Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics, Sultan Chand and Sons

**Format of Question Paper:****Internal Continuous Assessment: (20 marks)**

<b>Assignment/viva</b> Quizzes, Class Tests, presentation, project, assignment etc	<b>Class Test</b>	<b>Total</b>
05	15	20

**Semester End Examination: (30 marks)**

Semester End Examination will be of 30 marks of 01 hour duration covering entire syllabus of the semester. All questions are Compulsory.

**Theory Question Paper Pattern:**

Q 1	Attempt any one question out of two questions (Module I and II)	Max. marks: 10
Q 2	Attempt any two questions out of three questions (Module I)	Max. marks: 10
Q 3	Attempt any two questions out of three questions (Module II)	Max. marks: 10

**Sd/-**

**Sign of the BOS Chairman**  
**Dr. Santosh Gite**  
**Board of Studies in**  
**Statistics**

**Sd/-**

**Sign of the**  
**Offg. Associate Dean**  
**Dr. Madhav R. Rajwade**  
**Faculty of Science &**  
**Technology**

**Sd/-**

**Sign of the**  
**Offg. Dean**  
**Prof. Shivram S. Garje**  
**Faculty of Science &**  
**Technology**