Department of Statistics

(University of Calcutta, CBCS syllabus for Statistics Generic)

Program Outcomes:

PO1: (Disciplinary Knowledge) Adequate knowledge of fundamentals of statistics

PO2: (Self-directed Learning) Ability of life-long and continuous self learning

PO3: (Analytical reasoning) Ability to think critically and scientifically, identify logical flaws, relevance of evidence.

PO4: (Communications and Planning Skills) Ability to design a field survey, to extract real information, to read and write analytically, to present complex information in a clear and concise manner.

PO5: (Problem Solving) Capacity to extrapolate that has learned and ability to carry out multidisciplinary research

Course Outcomes:

Year	Course Name	Course Code	Course Outcome
Sem 1	**Descriptive Statistics** **(STS-A-GE-1-1-TH)** **&** **(STS-A-GE-1-1-P)**	**CO 1**	• Descriptive Statistics is the initial phase of exploratory data analysis which is commonly utilised when statistics are applied in real-world circumstances. • Students will be able to understand the concept of Multivariate data as well as Uni-variate data, Bi-variate data. *(Understand, Apply, Analyze)* • This topic is useful to demonstrate the fundamental characteristics of data and its graphical representations. *(Unit 1)* • Students will be able to compute different measures of location and scale parameters, and interpret the results. *(Unit 2)* • They can grasp the fundamental ideas of simple and multiple regressions. *(Unit 3)* • Practical assignments related to theoretical studies assist students in learning how to implement significant statistical methods in real-world data sets.
Sem 2	**Elementary Probability Theory** **(STS-A-GE-2-2-TH)** **&** **(STS-A-GE-2-2-P)**	**CO 2**	*(Understand, Remember and Apply: to evaluate)* • Classical, Statistical and Axiomatic approach of probability will be taught. They will learn concepts of total probability, conditional probability, Bayes' Theorem *(Unit 1)*

			• This is the first step to familiar students with random variables, pmf, pdf, cdf. *(Unit 2)*
			• Students will be familiar with some standard distributions and will know how to apply those distributions in a given dataset with the help of practical assignments. They will also be able to evaluate different moments and interpret the result. *(Unit 3)*
			• They will learn basic limit theorems and techniques associated with limiting normality and associated distributions. *(Unit 3)*
Sem 3	**Introduction to Statistical Inference** **(STS-A-GE-3-3-TH) & (STS-A-GE-3-3-P)**	**CO 3**	• This is a crucial prerequisite for comprehending statistical conclusions. • This course covers the fundamentals of data inference, including detail theory for point estimation, statistical hypothesis testing and confidence interval estimation. *(Understand, Apply, Analyze)* • Students will understand the essentials of random sampling and will learn the distributions of some standard statistics under a postulated model. *(Unit 1)* • They will understand how statistical theories are used to draw conclusions about the unknown with the help of necessary practical assignments. *(Unit 2)* • They also learn about controlled experiments and related inference difficulties in Design of Experiments. This topic will give ideas at how to plan experiments, carry them out, and analyse the results. Necessary practical assignments will be there to understand the issues and principles of experimental design. *(Unit 3)*
Sem 4	**Applications of Statistics (STS-A-GE-4-4-TH) & (STS-A-GE-4-4-P)**	**CO 4**	• Students will be able to apply their statistical knowledge in different field. *(Understand, Apply, Analyze)* • They will learn the essential concepts of finite populations, how to draw equal probability samples from populations using various sampling procedures, and how to estimate target quantities such as population mean and variances with their inferential knowledge. Sample survey theories will assist students in understanding how surveys are executed in various sectors. *(Unit 1)* • In Time Series analysis, students will learn about introductory theoretical advancements for a specific sort of dependency known as time dependency. This topic is crucial for Economics Honours students for their core course in Econometrics. *(Unit 2)*

| | | | • | Index number topic will make them able to compute different index numbers. *(Unit 2)* |
| | | | • | Vital Statistics topic comprehends the basic components of population (fertility, mortality, morbidity, migration) and how these influence population growth. *(Unit 3)* |

CO-PO Mapping:

CO	Course Name	Semester	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	**Descriptive Statistics**	1st	✓	✓	✓	✓	✓
CO 2	**Elementary Probability Theory**	2nd	✓	✓			✓
CO 3	**Introduction to Statistical Inference**	3rd	✓	✓	✓	✓	✓
CO 4	**Applications of Statistics**	4th	✓	✓	✓	✓	✓