Course Outcomes (COs): Statistics

B.Sc. Part II Statistics (Introduced in the year 2022-23)	
Semester III	
Paper V: Probability Distributions-I (DSC - 1004 C1)	
CO No.	**On completion of the course, student will be able to:**
CO1	Compute descriptive statistics, moments, skewness, kurtosis, m.g.f. and c.g.f for continuous univariate distributions.
CO2	Compute various statistical measures for continuous bivariate distributions.
CO3	Understand transformation of continuous univariate and bivariate random variable.
CO4	Understand various continuous probability distributions and their applications in different fields.
Paper VI: Statistical Methods (DSC - 1004 C2)	
CO1	Understand the concept of Multiple Linear Regression, residual.
CO2	Understand the concept of multiple correlation and partial correlation.
CO3	Compute simple, weighted index numbers and cost of living index number.
CO4	Understand the basics of official Statistics.
Semester IV	
Paper VII: Probability Distributions-II (DSC - 1004 D1)	
CO No.	**On completion of the course, student will be able to:**
CO1	Understand various continuous probability distributions and their applications in different fields.
CO2	Know the relation between various probability distributions.
CO3	Learn basics of R- software
CO4	Learn data analysis using R- software.
Paper VIII: Introduction to Reliability Theory & Testing of Hypothesis9DSC - 1004 D2)	
CO1	Understand the basic concepts of reliability and ageing properties.
CO2	Recognize the basic concepts of testing of hypothesis.
CO3	Distinguish between large and small sample tests.
CO4	Apply small and large sample tests in real life examples.

B.Com. Part II Business Statistics (Introduced in the year 2022-23)	
Semester III	
Business Statistics -Paper- I (CC - 1051 C)	
CO No.	On completion of the course, student will be able to:
CO1	Apply Statistics in various fields and classify data and representing it graphically.
CO2	Understand concept of population, sample and different methods of sampling.
CO3	Make familiar with statistical measures viz. Measures of Central Tendency and Dispersion.
CO4	Understand the concept of bivariate data and analyze data by using correlation and regression.
B.Com. Part II Business Statistics (Introduced in the year 2022-23)	
Semester IV	
Business Statistics -Paper- II (CC - 1051 D)	
CO No.	On completion of the course, student will be able to:
CO1	Understand the concept of probability and probability distributions and apply probability distributions in real life.
CO2	Measure trend and seasonal indices in Time series.
CO3	Compute simple and weighted Index numbers.
CO4	Distinguish between process and product control, plotting control charts for variable and attributes.
M.Sc. Part I Statistics (Introduced in the year 2022-23)	
Semester I	
Real Analysis (CC-2300A)	
CO No.	On completion of the course, student will be able to:
CO1	Define and recognize the basic properties of the field of real numbers.
CO2	Define and recognize the series of real numbers and convergence.
CO3	Apply the theorem in a correct mathematical way.
CO4	Define and recognize the real functions and its limits and differentiability of real functions and its related theorems.
Linear Algebra (CC-2301A)	
CO No.	On completion of the course, student will be able to:

CO1	Solve matrix operations, including inverses and determinants.
CO2	Demonstrate understanding of the concepts of vector space and subspace, linear independence, span, and basis.
CO3	Describe eigenvalues and eigenvectors and solve eigenvalue problems.
CO4	Apply principles of matrix algebra to linear transformations and solve systems of linear equations using multiple methods.

Distribution Theory (CC-2302A)

CO No.	On completion of the course, student will be able to:
CO1	Recognize and learn concept of mixture of distribution and their decomposition.
CO2	Execute transformation of univariate random variables and different moment inequalities.
CO3	Describe the concept of central and non-central distributions.
CO4	Learn the concept of order statistics.

Estimation Theory (CC-2303A)

CO No.	On completion of the course, student will be able to:
CO1	Describe the notion of a parametric models, point estimation of the parameters of those models.
CO2	Construct the sufficient statistic, minimal sufficient statistic, m.l.e., moment estimator of the parameter.
CO3	Discuss the concept of MVUE, MVBUE, UMVUE.
CO4	Describe the concept of Bayesian inference and their real life applications.

Statistical Computing (CC-2304A)

CO No.	On completion of the course, student will be able to:
CO1	Construct formulas, including the use of built-in functions and analysis tool pack.
CO2	Develop the fundamentals of statistical analysis in R environment.
CO3	Describe the simulation involves building mathematical models that attempt to duplicate real-world systems or problems
CO4	Implement different resampling technique in real situations.

Semester II

Probability Theory (CC-2306B)

CO No.	On completion of the course, student will be able to:
CO1	Memorize the basic concepts of Sets, Sequence, Measurable function and limit.
CO2	Recognize the measure theory, random variable, distribution function, limit of sequencevariables.
CO3	Explain the concept of convergence and applications with example.
CO4	Implement the central limit theorem and large-sample approximations for common statistics

Theory of Testing of Hypotheses (CC-2307B)

CO No.	On completion of the course, student will be able to:
CO1	Formulate null and alternative hypotheses, compute probabilities of types error, MP tests and MLR property.
CO2	Understand UMP and UMPU test with their applications.
CO3	Construct asymptotic confidence interval of a parameter and its relation with testing of hypothesis problem.
CO4	Execute small, large sample size tests and non-parametric tests in real life problems.

Linear Models and Regression analysis (CC-2308B)

CO No.	On completion of the course, student will be able to:
CO1	Understand General linear model, Gauss Markov theorem, variances and covariance's of BLUEs.
CO2	Understand and apply multiple regression models in real life situations.
CO3	Understand concept of multicollinearity and non-linear regression.
CO4	Understand concept of Robust regression.

Design and analysis of Experiment (CC-2309B)

CO No.	On completion of the course, student will be able to:
CO1	Memorize the basic concepts of design of experiments, concept of confounding.
CO2	Analyse different factorial and fractional experiments their interactions, graphical representation and confounding.
CO3	Describe the concept of fractional factorial design.
CO4	Understand the concept of response surface and methods of fitting it.

Sampling Theory & Official Statistics (CC-2310B)

CO No.	On completion of the course, student will be able to:

CO1	Understand the basic concept of random sampling and different methods of sampling.
CO2	Apply unequal probability sampling designs viz. PPSWR, PPSWOR including Lahiri's method and Murthy's estimator for survey.
CO3	Implement Cluster sampling, Two –stage sampling, Multistage sampling, Ratio and Regression estimation in real life problems.
CO4	Recognize non-sampling error, Response and non-response errors. Apply different model andtechnique to overcome errors.