Government City College (A)
Hyderabad-500002
(Affiliated to Osmania University)
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Department of Statistics

Course Outcomes

Course Title: Mathematical Analysis

On Completion of this course the students will be able to:

S. No.	Course Outcomes	Blooms Taxonomy Classification
CO1	Recall and explain key definitions and theorems in mathematical analysis, such as the definition of limits, continuity, and the Mean Value Theorem.	Remembering
CO2	Interpret the significance and implications of theorems and concepts, demonstrating comprehension of topics like convergence, uniform continuity, and Riemann integration.	Understanding
CO3	Utilize mathematical tools and techniques to solve problems in various contexts, applying differentiation and integration to analyze functions and sequences.	Applying
CO4	Examine mathematical structures and arguments critically, identifying patterns, contradictions, and the logical connections between different concepts and results.	Analyzing
CO5	Develop new mathematical proofs, conjectures, or solutions, showcasing originality and innovation in constructing mathematical arguments or devising novel approaches to problem-solving.	Creating

Course Title: Linear Algebra & Linear models

On successful completion of the course, Students will be able to:

S.No.	Course Outcomes	Blooms Taxonomy Classification
CO1	Recall fundamental concepts such as vector spaces, linear transformations, and matrix operations from memory.	Remembering
CO2	Explain theorems like the Cayley-Hamilton theorem, grasping their significance in linear algebra and model building.	Understanding
CO3	Utilize linear algebra techniques to solve complex systems of equations, apply eigenvalue decomposition in data analysis, and implement linear regression models in real-world scenarios.	Applying
CO4	Critically evaluate the behavior of matrices under different operations, assess the stability of linear models, and analyze the sensitivity of solutions to changes in input parameters.	Analyzing
CO5	Develop new methodologies for solving large systems of linear equations, design novel algorithms for data compression using matrix factorization techniques, or propose innovative applications of linear models in diverse fields, showcasing creativity and originality in problem-solving.	Creating

Course Title: Applied Probability Theory

After completing the course students are expected to be able to:

S.No.	Course Outcomes	Blooms Taxonomy Classification
CO1	Recall basic probability concepts such as sample spaces, events, and probability distributions.	Remembering
CO2	Interpret the principles of probability theory including conditional probability, independence, and random variables, understanding their theoretical underpinnings.	Understanding
CO3	Utilize probability distributions to model real-world phenomena; apply techniques such as Bayes' theorem and the central limit theorem to solve practical problems in various fields.	Applying
CO4	Analyze statistical data using probability theory, evaluate the reliability of statistical inferences, and assess the validity of probabilistic models through hypothesis testing and model fitting.	Analyzing
CO5	Develop new probabilistic models to address emerging challenges, design innovative approaches for risk assessment or decision-making under uncertainty, demonstrating originality and creativity in probabilistic reasoning and application.	Creating

Course Title: Distribution theory and Estimation

After completing the course students are expected to be able to:

S. No.	Course Outcomes	Blooms Taxonomy Classification
CO1	Recall fundamental probability distributions such as normal, binomial, and Poisson distributions, as well as key estimation methods.	Remembering
CO2	Interpret the properties and characteristics of various probability distributions, comprehend estimation techniques including maximum likelihood estimation and method of moments.	Understanding
CO3	Implement distribution theory and estimation methods to analyze real-world data, make predictions, and draw conclusions in diverse fields such as finance, engineering, and social sciences.	Applying
CO4	Evaluate the performance of estimation procedures, assess the efficiency and bias of estimators, and analyze the properties of different probability distributions under various conditions.	Analyzing
CO5	Develop new estimation techniques or modify existing methods to address specific challenges, design novel approaches for modeling complex distributions, demonstrating innovation and creativity in statistical inference.	Creating

COURSE TITLE: Statistical Inference

After completing the course students are expected to be able to:

S. No.	Course Outcomes	Blooms Taxonomy Classification
CO1	Recall foundational concepts of statistical inference such as sampling distributions, hypothesis testing, and confidence intervals.	Remembering
CO2	Interpret the theoretical basis of statistical inference, comprehend the principles of estimation, and grasp the significance of probability distributions in inference.	Understanding
CO3	Utilize inferential techniques to draw conclusions from data, apply hypothesis tests and confidence intervals to make decisions and predictions in various domains.	Applying
CO4	Evaluate the validity of statistical inference procedures, assess the assumptions underlying inferential methods, and analyze the impact of sample size on inference.	Analyzing
CO5	Develop new methodologies for statistical inference, design innovative approaches for hypothesis testing or estimation, demonstrating originality and creativity in statistical reasoning and application.	Creating

COURSE TITLE: Sample Theory and Surveys

After completing the course students are expected to be able to:

S. No.	Course Outcomes	Blooms Taxonomy Classification
CO1	Recall various sampling methods such as simple random sampling, systematic sampling, and stratified sampling, along with their definitions and characteristics.	Remembering
CO2	Interpret the theoretical underpinnings of sample theory and survey methodologies, understanding concepts like sampling bias, sampling frames, and the importance of randomization.	Understanding
CO3	Utilize sampling techniques to design surveys and experiments, apply appropriate sampling methods to ensure representative samples, and implement survey protocols in real-world settings.	Applying
CO4	Analyze survey data to assess the reliability and validity of collected information, evaluate the impact of sampling errors on survey results, and critically examine the effectiveness of different sampling strategies.	Analyzing
CO5	Design innovative sampling methodologies tailored to specific research contexts, develop novel survey designs incorporating advanced sampling techniques, and propose creative solutions to address challenges in sampling and survey implementation, demonstrating originality and ingenuity in sample theory and survey methodology at the postgraduate level.	Creating

COURSE TITLE: Multivariate Data Analysis

After completing the course students are expected to be able to:

S.No.	Course Outcomes	Blooms Taxonomy Classification
CO1	Recall key multivariate statistical techniques such as principal component analysis (PCA), factor analysis, and cluster analysis, along with their basic principles and assumptions.	Remembering
CO2	Interpret the theoretical foundations of multivariate data analysis, including concepts such as covariance matrices, eigenvalues, and eigenvectors, grasping their significance in data reduction and dimensionality reduction.	Understanding
CO3	Apply multivariate analysis techniques to analyze complex datasets, implement PCA to identify patterns and relationships among variables, and use cluster analysis to classify observations into distinct groups.	Applying
CO4	Evaluate the results of multivariate analysis, interpret the meaning of principal components or factor loadings, and assess the reliability and validity of clustering solutions.	Analyzing
CO5	Develop new methodologies for multivariate data analysis, design innovative approaches to address specific challenges in high-dimensional data, and propose novel applications of multivariate techniques in diverse fields, demonstrating creativity and originality in multivariate data analysis at the postgraduate level.	Creating

COURSE TITLE: Design and Analysis of Experiments

After completing the course students are expected to be able to:

S. No.	Course Outcomes	Blooms Taxonomy Classification
CO1	. Recall basic experimental design principles such as randomization, replication, and blocking, along with key statistical concepts like ANOVA and factorial designs.	Remembering
CO2	Interpret the theoretical foundations of experimental design, including concepts such as experimental error, treatment effects, and interaction effects, comprehending their significance in conducting experiments.	Understanding
CO3	Apply experimental design techniques to plan and conduct experiments in various fields, implement factorial designs to study the effects of multiple factors, and analyze experimental data using appropriate statistical methods.	Applying
CO4	Critically analyze experimental results, interpret main effects and interaction effects, assess the validity of experimental conclusions, and evaluate the impact of experimental design choices on study outcomes.	Analyzing
CO5	Develop new experimental designs tailored to specific research objectives, design innovative approaches for data collection and analysis in experimental studies, and propose creative solutions to address challenges in experimental design and analysis, demonstrating originality and ingenuity in the field of design and analysis of experiments.	Creating