DEPARTMENT OF STATISTICS
UNIVERSITY OF MADRAS

Syllabus for the Common Entrance Examination (AY 2024-25)

M.Sc., Statistics and M.Sc., Actuarial Science (SS)

Vector spaces, Linear dependence, linear independence, basis of vector space, inner product - Matrix algebra, rank and inverse of a matrix, determinants, characteristic roots, characteristic polynomial, Cayley Hamilton theorem, multiplicity of characteristic roots, idempotent matrix. Elements of set theory, real numbers, n-dimensional Euclidian space open and closed intervals, sequences and series; their convergence. Real valued functions, continuous functions; uniform continuity, sequences of functions. Differentiation, maxima minima of functions; functions of several variables, constrained maxima - minima of functions - Functions of several variables, partial derivatives.

Descriptive Statistics - Measures of central tendency, dispersion - skewness and kurtosis. Correlation analysis and regression analysis. Probability theory: Counting principle problems based on permutations and combinations- addition and multiplication theorem – conditional probability - independent events - Bayes theorem - simple problems. Distribution Theory: Random Variables - Expectation - variance - joint, marginal and conditional distributions and their properties. Moment generating and characteristic functions - their properties. Discrete and Continuous distributions; binomial, Poisson, normal, and their properties.

****