CY-415 MATHEMATICS AND STATISTICS

Limits And Continuity: Limit point of sets, sequences, convergence of sequences, function and their graph, limit of function and continuous functions.

Differential Calculus: Differentiation by first principle, differentiation by rule, implicit function, logarithmic differentiation, successive differentiation, rate of change, Hopital's rule, extreme values of a function of one variable using first and second derivative test, asymptotes of a function, partial differentiation, exact differential and its application in computing errors, multivariate functions.

Integral Calculus: Indefinite integral, use of trigonometric relations, methods of substitution, integration by parts, reduction formulae, definite integrals and their convergence, Beta and Gamma Integrals.

Measurements, Results & Experimental Errors: Measures of Central Tendency and spread, Accuracy, Precision, Error and Uncertainty

Propagation of Uncertainty: Uncertainty When Adding or Subtracting, Uncertainty When Multiplying or Dividing, Uncertainty for Mixed Operations, Uncertainty for Other Mathematical Functions

The Distribution of Measurements and Results: Populations and Samples, Probability Distributions for Populations & samples, Confidence Intervals for Populations and samples

Statistical Analysis of Data Significance Testing, Constructing a Significance Test, One-Tailed and Two-Tailed Significance tests, Errors in Significance Testing, Linear Regression.

Statistical Methods for Normal Distributions: Comparing mean to m, Comparing *s*2 to s2, Comparing Two Sample Variances, Comparing Two Sample Means, Outliers.

*For candidate who hasn't studied mathematics/statistics as subsidiary (undergraduate level) course at BS(Four Years)/M.Sc. level