MA1005E APPLIED MATHEMATICS

L	T	P/D	O	C
3	1	0	6	3

Pre-requisites: NIL

Total Sessions: 39L +13T

Course Outcomes:
CO1: Appreciate the role of differentiation and integration in architectural parameters like area, volume, etc.
CO2: Associate the fundamental structure of 2D plane and 3D space and the properties of different structures in plane and space.
CO3: Represent lines, planes and three-dimensional objects using different coordinate systems
CO4: Comprehend various probability distributions
CO5: Apply the concept of sampling and testing methods for different kinds of studies
CO6: Perform Testing of hypothesis and tests for goodness of fit.

Basic Calculus
Applications of differentiation, Definite integrals, Volumes using cross sections, Solids of revolution, Arc length, Areas of surface of revolution. Double integrals, Area and Volume by double integration, Triple integrals, Applications.

Geometry
Conic sections, Coordinate systems: Cartesian, Polar, Spherical and Cylindrical, Vectors, Lines and planes in space, Spheres and Cylinders, Curves in space and their tangents, Arc length in space, Curvature, normal, velocity and acceleration.

Probability and Distributions
Probability distributions, Random variables, Expectation of a function of a random variable, Mean, Variance and Moment generating function of a probability distribution, Chebyshev's theorem, Binomial distribution, Poisson distribution, Geometric distribution, Normal Distribution, Uniform distribution.

Statistics
Population and samples, the sampling distribution of the mean, Sampling distribution of the variance, Point estimation, Interval estimation, Tests of hypothesis, Hypothesis tests concerning one mean and two means. Hypothesis tests concerning one variance and two variances, Estimation of proportions, Hypothesis tests concerning one proportion and several proportions, Analysis of r x c contingency tables, Chi-square test for goodness of fit.

References:
1. G.B. Thomas and R.L. Finney, *Calculus and Analytical Geometry*, Addison-Wesley, 1998.
2. S. B. Rao and C. K. Shantha, *Differential Calculus*, Wiley Eastern Ltd, 2002.
3. V. Gutenmacher and N. B. Vasilyev, *Lines and Curves: A Practical Geometry Handbook*, Birkhäuser, Boston, 2004.
4. R. A. Johnson, Miller and Freund's *Probability and Statistics for Engineers*, 8 th edition, New Delhi, Prentice Hall of Indian, 2011.
5. W. W. Hines, D. C. Montgomery, D. M. Goldsman and C. M. Borror, *Probability and Statistics in Engineering*, 4th edition, New York, John Wiley & Sons, Inc., 2003
6. S.M. Ross, Introduction to *Probability and statistics for Engineers and Scientists*, 5 rd edition, New Delhi, Academic Press (Elsevier), 2014.