Indian Institute of Engineering Science and Technology, Shibpur
Department of Mathematics

B. Arch. First Semester Course

Subject : Mathematics-IA (MA-1102)

Weekly contact: 2-1-0 (L-T-P) Full Marks : 100 Credit: 3

Sl. No.	Module name and topics	No. of classes
1.	**Functions of a Single Real Variable:** n-th order derivative, Leibnitz's theorem for successive differentiation, Taylor's theorem with Lagrange's and Cauchy's forms of remainders, Taylor's and Maclaurin's series, expansion of functions, curvature, asymptotes, curve tracing.	15
2.	**Functions of Several Real Variables:** Partial derivatives, chain rule, differential and small error, Euler's theorem for homogeneous functions, Taylor's theorem (statement only), expansion of functions of two real variables, maxima and minima, Lagrange's method of multipliers.	15
3.	**Infinite Series:** Concept of convergence, Geometricsseries and p series, Comparison test, D'Alembert's Ratio Test, Cauchy's Root Test, Raabe's Test, Gauss test, Power series, Radius of convergence.	6
4.	**Multiple Integral:** Doubleintegral, change of order of integration, Jacobian, change of variables, applications.	6
	First half: Sl. No. 1, 3 Second half: Sl. No. 2, 4	42

Suggested Reading: (1) Advanced Engineering Mathematics – E. Kryszig, (2) Engineering Mathematics – B. S. Grewal, (3) Introductory Course in Differential Equations – Daniel A. Murray, (4) Differential Calculus – B. C. Das & B. N. Mukherjee, (5) Integral Calculus – B. C. Das & B. N. Mukherjee, (6) Advanced Calculus – D. V. Widder.

Indian Institute of Engineering Science and Technology, Shibpur

Department of Mathematics

B. Arch. Second Semester Course

Subject : Mathematics-IIA (MA-1202)

Full Paper: 3 – 0 – 0 (L – T – P) Full Marks: 100 Credit: 3 Prerequisite: None

Module No.	Module Name and Topics	No. of Classes
1.	**Co-ordinate Geometry** – Two dimensions: Transformation of coordinates – Translation, Rotation , Reduction of general equation of second degree.	4
2.	**Co-ordinate Geometry** – Three dimensions: Coordinates, Direction Cosines, Planes, Straight lines, Spheres, Standard equations of simple surface e.g. cylinders, cones, ellipsoids, Hyperboloids etc.	9
3.	**Vector Algebra:** Sum and products of vectors, Application in Geometry.	4
4.	**Linear Programming:** Geometrical ideas of convex sets, feasible solutions and domains etc. Fundamental theorem of LPP (statement only), Graphical methods, Simplex Algorithm.	7
5.	**Statistics:**Analysis of data (direct and grouped), Frequency Diagrams, Ogive, Histogram, Mean, Median, Mode, Measures of dispersion, Skewness, Kurtosis, Fitting of curves (Least square method), Correlation, Regression.	10
6.	**Differential Equations:**Second order differential equations with constant co-efficients,Cauchy-Euler differential equation and Variation of parameters.	8
	Total	**42**

Suggested Reading: (1) Analytical Geometry of Two & Three Dimensions & Vector Analysis – R.M. Khan, (2) Vector Analysis: Schaum's Outline Series – M. Spiegel, (3) Linear Programming & Game Theory – J.G. Chakraborty & P.R. Ghosh, (4) Linear Programming & Theory of Games – P.M. Karak, (5) Statistical Methods – N.G. Das, (6) Fundamentals of Statistics – A.M. Gun, M.K. Gupta, B. Dasgupta, (7) An Introduction to Differential Equations – Ghosh, Maity, (8) Ordinary and Partial Differential Equations – M.D Raisinghania