

राष्ट्रीय प्रौद्योगिकी संस्थान सिलचर / National Institute of Technology Silchar
गणित विभाग / Department of Mathematics

दिनांक : १३/०७/२०२६ / Date : 13.07.2026

:: **Subject Code: MA 21003** :: **Subject Name: Mathematical Analysis and Probability Theory** ::

Name of Course Coordinator: Dr. Praveen Kumar Gupta (Total Credit: 03 Credits)

Name of Course Instructors: Dr. G. Ramesh (ECE), Dr. A. Sensarma (EE), Dr. P.K. Gupta (EIE).

First Day of Instruction	16 th July, 2026
Mid-Semester Examination	28 th September – 06 th October, 2026
Minor Test Examination	10 th November, 2026 (Tentative)
Last Day of Instruction	27 th November, 2026
End-Semester Examination	30 th November – 09 th December, 2026

Lecture Plan for July – December 2026

S.N.	Description	Lectures
1.	Vector Calculus: Scalar & Vector Triple Product of vectors and their applications, Vector equations of lines & planes.	L1-L3
2.	Vector function of a single scalar variable, Limit, Continuity & differentiability. Geometrical and physical interpretation of derivatives and their applications	L4-L5
3.	Scalar & Vector fields, Introduction to line, double and triple integrals	L6-L7
4.	Applications of Green's, Stokes' and Gauss Divergence theorem	L8-L10
5.	Complex Analysis: Limit, continuity, differentiability and analyticity of functions, Cauchy-Riemann equations	L11-L13
6.	Line integrals in complex plane, Cauchy's integral theorem, Cauchy's integral formula, derivatives of analytic functions	L14-L16
7.	Taylor's series, Laurent's series, Zeros and singularities, Residue theorem, Evaluation of real integrals	L17-L19
8.	Numerical Analysis: Finite differences, Newtons forward and backward interpolation formulae	L20-L22
9.	Numerical Integration: Trapezoidal and Simpsons 1/3rd rules	L23-L24
10.	Solution of algebraic and transcendental equations - Bisection, Newton-Raphson and Regula-falsi methods	L25-L26
11.	Numerical solutions of ODE and PDE, Euler's method, Taylor's method, Runge-Kutta method (4th order)	L27-L29
12.	Probability Theory: Introduction to probability, Additive & multiplicative Laws of probability, Conditional probability, Independent events, Baye's theorem	L30-L32
13.	Random variable, Probability mass function, Probability density function, Cumulative distribution function	L33-L35
14.	Binomial, Poisson & Normal distributions	L36-L38

Reference Books:

1. E. Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley India Pvt Ltd, New Delhi, 2015.
2. M.K. Jain, S.R.K. Iyenger and R.K. Jain, Numerical Methods (For Scientific and Engineering Computation), 6th Edition, New Age international publishers, 2014.
3. D.C. Montgomery, G.C. Runger, Applied Statistics and Probability for Engineers, 6th Edition, Wiley, 2024.
4. S. Lipschutz and J.J. Schiller, Introduction to Probability and Statistics, Schaum's Outline Series, 2011.



(Dr. P.K. Gupta)
Course Coordinator