

MATHEMATICS FOR CIVIL ENGINEERS

Credits	Periods			Exam Hrs.	Sessional Marks	Exam Marks	Total Marks
	Theory	Tutorial	Lab				
3	3	1	-	3	40	60	100

PURPOSE

To impart analytical ability in solving mathematical problems as applied to the respective branches of Engineering

INSTRUCTIONAL OBJECTIVES

- 1 To understand the concepts on fundamental theorems and complex variables.
- 2 To familiarize with the applications of complex integration.
- 3 To equip themselves familiar with Numerical techniques and Numerical Integration.

SYLLABUS

UNIT – I : Mean Value theorems & Complex Variables (14 Periods)

Fundamental theorems: Rolle's Mean value Theorem – Lagrange's Mean Value Theorem – Cauchy's mean value Theorem – (all theorems without proof but with geometrical interpretations).

Complex Functions: Introduction, limit of a complex function, derivative of complex function, Cauchy-Riemann equations, Analytic function, Harmonic functions, Applications to flow problems.

[4.3(1, 2, 3), 20.1, 20.2, 20.3, 20.4, 20.5, 20.6]

UNIT – II : Complex Integration (10 Periods)

Complex integration: Complex integration, Cauchy's theorem, Cauchy's integral formula, Series of complex terms (Taylor's, Laurent's series), Residues, residue theorem, calculation of residues.

[20.12, 20.13, 20.14, 20.16, 20.17, 20.18, 20.19]

UNIT – III : Numerical Methods (12 Periods)

Numerical solution of equations: Solution of Algebraic and Transcendental Equations, Bisection method, Method of false position, Newton-Raphson Method.

Numerical Integration: Trapezoidal rule, Simpson's 1/3 Rule, Simpson's 3/8 Rule.

[28.2, 28.3, 30.4, 30.6, 30.7, 30.8]

UNIT – IV : Numerical Differentiation (12 Periods)

Numerical solution of Ordinary Differential equations: Picard's Method, Taylor's series method, Euler's Method, Runge-Kutta Method, Predictor-Corrector Methods, Milne's Method.

[32.2, 32.3, 32.4, 32.7, 32.8, 32.9]

UNIT – V: Probability & Distributions

(12 Periods)

Probability and Distributions: Basic terminology, probability and set notations, addition law of probability, independent events, Multiplication law of probability, Baye's theorem, Random variables, Discrete probability distribution, continuous probability distribution, Expectation, Mean ,Median, Mode and Variance using Probability density function, Binomial distribution, Poisson distribution, Normal Distribution.

[26.2, 26.3, 26.4, 26.5, 26.6, 26.7, 26.8, 26.9, 26.10, 26.14, 26.15, 26.16]

Text Book Prescribed :

1. Dr. B.S. Grewal, Higher Engineering Mathematics, 43rd edition, Khanna Publishers, New Dehli.

Reference books:

1. N.P. Bali, Dr . Ashok Saxena, Dr.N.Ch.S. Narayana, A Text book on Engineering Mathematics Laxmi pub.(p)Ltd. New Dehli.
2. Erwin kreyszig. Advanced Engineering Mathematics, John Wiley and sons ,Newyork.
3. Probabiltiy, Statistics & Random process by T.Veerajan, Tata McGraw-Hill Educations.
4. Greenberg M D, "Advanced Engineering Mathematics", 2nd Edition, Pearson Education, Singapore, Indian Print, 2003.