

BMS COLLEGE OF ENGINEERING, BANGALORE – 560019
MATHEMATICS DEPARTMENT
SYLLABUS (2011 - 2012)
FOURTH SEMESTER B.E COURSE - (Common to all branches except for BT)

Course Name	Engineering Mathematics-4	Course Code	11MA4ICMAT
Credits	04	L – T - P	3 -1- 0
Contact hours	52 hours (40L+12T)		

Objectives:

To prepare students with adequate knowledge in mathematics to succeed in industry and provide necessary platform to pursue academics, keeping pace with global standards. Topics spanned are Probability and Statistics, Complex Analysis and series solution of Differential Equations. The thrust is to identify and clarify concepts of mathematics needed for the graduation program.

Course outcomes:

Students on completion of the course will

- i) Demonstrate an ability to combine fundamental knowledge of engineering principles and mathematical techniques to identify, formulate and solve problems in Engineering.

UNIT-1

STATISTICS

[10 hours]

Curve fitting – Fitting a straight line, fitting of a parabola, fitting of curves of the form $y = a b^x$, $y = a x^b$, $y = a e^{bx}$; Correlation and regression. **(4L+1T)**

PROBABILITY 1

Probability of an event, axiomatic definition, addition theorem, conditional probability, multiplication theorem, Bayes' theorem. **(4L+1T)**

UNIT-2

PROBABILITY 2

[10 hours]

Probability distributions: Random variables, Discrete probability distributions, continuous probability distributions, Some standard distributions: Binomial distribution, Poisson distribution, exponential distribution, normal distribution. **(8L+2T)**

UNIT-3

COMPLEX ANALYSIS 1

[10 hours]

Function of a complex variable, Analytic functions, Cauchy-Riemann equations, construction of analytic functions, Cauchy-Reimann equations in Polar form.

Transformations- $w = z^2$, $w = e^z$ and $w = z + \frac{a^2}{z}$ ($z \neq 0$), Bilinear transformations.

(8L+2T)

UNIT-4

COMPLEX ANALYSIS 2

[12 hours]

Complex integration-Cauchy's theorem, Cauchy's integral formula, Taylor's and Laurent's series, Singular points, poles, residues, the residue theorem. (5L+2T)

SERIES SOLUTION OF DIFFERENTIAL EQUATIONS

Series solution-Frobenius method, series solution of Bessel's differential equation leading to Bessel function of first kind, equations reducible to Bessel's differential equation, series solution of Legendre's differential equation leading to Legendre polynomials, Rodrigue's formula.

(4L+1T)

UNIT-5

PROBABILITY 3

[10 hours]

Joint Probability distributions: Case of discrete random variables, mathematical expectation, correlation, covariance.

Markov Chain: Probability vectors, stochastic matrices, fixed points, regular stochastic matrices. Markov chains, higher transition probabilities, stationary distribution of regular Markov chains and absorbing states.

(7L+3T)

Text Books

1. Advanced Engineering Mathematics, Erwin Kreyszig, 8th edition, 2007, Wiley-India
2. Higher Engineering Mathematics, B.S. Grewal, 40th edition, 2007, Khanna Publishers.

Reference Books:

1. Advanced Modern Engineering Mathematics, Glyn James, 3rd edition, 2004, Pearson Education.
2. Higher Engineering Mathematics, B.V. Ramana, 2007, Tata Mc. Graw Hill.
3. Advanced Engineering Mathematics, P. V. O' Neil, 5th Indian reprint, 2009, Cengage learning India Pvt. Ltd.

Question Paper Pattern

1. Each unit consists of one full question.
2. Each full question consists of three or four subdivisions.
3. Five full questions to be answered.
4. Internal Choice in Unit 2 and Unit 4