

new



MATHEMATICS-II

AICTE NEW/OLD

BS 203 MT

Instruction: 3+1 periods per week
CIE: 30 marks
Credits : 4

Duration of SEE: 3 hours
SEE: 70 marks

Objectives:

1. To study matrix algebra and its use in solving system of linear equations and in solving eigen value problems
2. To provide an overview of ordinary differential equations
3. To study special functions like Legendre and Beta Gamma functions
4. To learn Laplace Transforms and its properties

Outcomes:

1. Solve system of linear equations and eigen value problems
2. Solve certain first order and higher order differential equations
3. Solve basic problems of Beta Gamma and Legendre's Function.
4. Apply Laplace Transforms; solve ordinary Differential Equations by using it.

UNIT - I

Matrices: Rank of a matrix, Echelon form, System of linear equations, Linearly dependence and independence of vectors, Linear transformation, Orthogonal transformation, Eigen values, Eigenvectors, Properties of eigen values, Cayley - Hamilton theorem, Quadratic forms, Reduction of quadratic form to canonical form by orthogonal transformation, Nature of quadratic forms.

UNIT - II

Differential Equations of First Order: Exact differential equations, Integrating factors, Linear differential equations, Bernoulli's, Riccati's and Clairaut's differential equations, Orthogonal trajectories of a given family of curves.

UNIT - III

Differential Equations of Higher Orders: Solutions of second and higher order linear homogeneous equations with constants coefficients, Method of reduction of order for the linear homogeneous second order differential equations with variable coefficients, Solutions of non-homogeneous linear differential equations, Method of variation of parameters, solution of Euler-Cauchy equation.

UNIT - IV

Special Function: Gamma Functions, Beta Functions, Relation Between Beta and Gamma Function, Error Functions. Power Series Method, Legendre's Differential Equations and Legendre's Polynomial $P_n(x)$, Rodrigue's Formula (without proof).

UNIT - V

Laplace Transforms: Laplace Transforms, Inverse Laplace Transforms, Properties of Laplace Transforms and inverse Laplace Transforms, Convolution Theorem (without proof). Solution of ordinary Differential Equations using Laplace Transforms.

1. nejeed
19/8/23

2. Alaw

3. Poolley
19/8

4. Kanaka - 19/8/23

5. Sriniv
19/8/23

6. S.A. Sahan
19/8/23 3

7. F 19/8/23

10. _____

8. _____

9. _____

11. Vkm

Reddy
19/8/23
Head
Department of Mathematics
Osmania University
Hyderabad-500 1

Suggested Reading:

1. R.K. Jain & S.R.K. Iyengar, *Advanced Engineering Mathematics*, Narosa Publications, 4th Edition, 2014.
2. Erwin Kreyszig, *Advanced Engineering Mathematics*, John Wiley, 9th Edition, 2012.
3. Dr.B.S. Grewal, *Higher Engineering Mathematics*, Khanna Publications, 43rd Edition, 2014.
4. B.V. Ramana, *Higher Engineering Mathematics*, 23rd reprint, 2015.
5. N. Bali, M. Goyal, A text book of *Engineering Mathematics*, Laxmi publications, 2010
6. H.K. Dass, Er. Rajnish Varma, *Higher Engineering Mathematics*, Schand Technical Third Edition.

Handwritten signature
19/8/23

Head
Department of Mathematics
Osmania University
Hyderabad-500 007.