22MT110 MATRICES AND DIFFERENTIAL **EQUATIONS**

Hours Per Week	:	
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3 2	0	4	

12L+8T+0P=20 Hours

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com/matrices-differentialequations-nep-b-sc-sem-

PREREQUISITE KNOWLEDGE:

School level Mathematics, Differentiation and Integration

COURSE DESCRIPTION AND OBJECTIVES:

This course will help the students to learn the concepts of matrices and differential equations. Also they can apply these concepts in any engineering and science domains.

MODULE-1

UNIT -1

MATRICES

Definition of matrix; Types of matrices, Algebra of matrices, adjoint of a matrix, inverse of a matrix by elementary operations, Rank of a matrix, Echelon form, Normal form.

UNIT-2

APPLICATIONS OF MATRICES

Consistency of system of linear equations, Solution of system of linear equations by Gauss elimination method and Gauss Jordan method.

Eigen values and Eigen vectors (up to 3 x 3 matrices only) and properties (without proofs).

PRACTICES:

- Identify the matrix and do various operations on it.
- Finding rank of matrix.
- Solving a system of equation using matrix method
- Find Eigen values and Eigen vectors. •

MODULE-2

UNIT-1

ORDINARY DIFFERENTIAL EQUATIONS

First Order Differential Equations: Introduction to ODE, variable separable method, homogenous and non-homogenous differential equations, linear differential equations, Bernoulli's equations.

Second Order Differential Equations: Linear Homogeneous and non-homogeneous differential equations with constant coefficients (RHS is eax, xn, sin(ax) or cos(ax)).

AND DIFFERENTIAL EQUATIONS Matrices and Differential Equations B.Sc. First Year | Semester II

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12L+8T+0P=20 Hours

UNIT-2

APPLICATIONS OF ODE

Applications of ODE: Newton's law of cooling, Law of natural growth and decay, LC circuit.

PRACTICES:

- Finding Solutions of Differential Equations.
- Apply the concepts of Differential equations.

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Apply elementary transformations to find the rank and inverse.	Apply	1	1, 2, 9, 10, 12
2	Solve the Ordinary differential equations.	Apply	2	1, 2, 9, 10, 12
3	Apply the differential equation in various problems.	Apply	2	1, 2, 9, 10, 12
4	Examine the consistency of the system of linear equations.	Analyse	1	1, 2, 9, 10, 12

TEXT BOOKS:

- 1. N. P. Bali, K. L. Sai Prasad, "A Textbook of Engineering Mathematics I, II, III", 2nd Edition, Universal Science Press, New Delhi, 2018.
- 2. B. S. Grewal, "Higher Engineering Mathematics", 44th Edition, Khanna Publishers, 2018.

REFERENCE BOOKS:

- Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Edition, John Wiley & Sons, Inc., 2015
- 2. H. K. Dass and Er. Rajanish Verma, "Higher Engineering Mathematics", 3rd Edition, S. Chand & Co., 2015.
- 3. B. V. Ramana, "Advanced Engineering Mathematics", TMH Publishers, 2020.