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MA8352 LINEAR ALGEBRA AND PARTIAL DIFFERENTIAL EQUATIONS L T P C 4 0 0 4

UNIT I VECTOR SPACES 12

Vector spaces – Subspaces – Linear combinations and linear system of equations – Linear independence and linear dependence – Bases and dimensions.

UNIT II LINEAR TRANSFORMATION AND DIAGONALIZATION 12

Linear transformation - Null spaces and ranges - Dimension theorem - Matrix representation of a linear transformations - Eigenvalues and eigenvectors - Diagonalizability.

UNIT III INNER PRODUCT SPACES 12

Inner product, norms - Gram Schmidt orthogonalization process - Adjoint of linear operations - Least square approximation.

UNIT IV PARTIAL DIFFERENTIAL EQUATIONS 12

Formation – Solutions of first order equations – Standard types and equations reducible to standard types – Singular solutions – Lagrange's linear equation – Integral surface passing through a given curve – Classification of partial differential equations - Solution of linear equations of higher order with constant coefficients – Linear non-homogeneous partial differential equations.

UNIT V FOURIER SERIES SOLUTIONS OF PARTIAL DIFFERENTIAL EQUATIONS 12

Dirichlet's conditions – General Fourier series – Half range sine and cosine series - Method of separation of variables – Solutions of one dimensional wave equation and one-dimensional heat equation – Steady state solution of two-dimensional heat equation – Fourier series solutions in Cartesian coordinates.

TEXTBOOKS:

1. Grewal B.S., —Higher Engineering MathematicsII, Khanna Publishers, New Delhi, 43rd Edition, 2014.
2. Friedberg, A.H., Insel, A.J. and Spence, L., —Linear AlgebraII, Prentice Hall of India, New Delhi, 2004.

REFERENCES:

1. Burden, R.L. and Faires, J.D, "Numerical Analysis", 9th Edition, Cengage Learning, 2016.
2. James, G. —Advanced Modern Engineering MathematicsII, Pearson Education, 2007.
3. Kolman, B. Hill, D.R., —Introductory Linear AlgebraII, Pearson Education, New Delhi, First Reprint, 2009.
4. Kumaresan, S., —Linear Algebra – A Geometric ApproachII, Prentice – Hall of India, New Delhi, Reprint, 2010.
5. Lay, D.C., —Linear Algebra and its ApplicationsII, 5th Edition, Pearson Education, 2015.
6. O 'Neil, P.V., —Advanced Engineering MathematicsII, Cengage Learning, 2007.

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7. Strang, G., —Linear Algebra and its applicationsll, Thomson (Brooks/Cole), New Delhi, 2005.
8. Sundarapandian, V. —Numerical Linear Algebra, Prentice Hall of India, New Delhi, 2008.