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| **B. TECH 2nd SEMESTER** | **T** | **P** | **C** |
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| **BTMA2T01 LINEARALGEBRA & VECTOR CALCULUS** |

**UNIT I: Linear systems of equations**

Rank-Echelon form, Normal form – Solution of Linear Systems – Direct Methods- Gauss Elimination- Gauss Jordon and Gauss Seidal Methods.

Application: Finding the current in an electrical circuit.

**UNIT II: Eigen values - Eigen vectors and Quadratic forms**

Eigen values - Eigen vectors– Properties (without proof)– Cayley-Hamilton Theorem (without proof) - Quadratic forms- Reduction of quadratic form to canonical form – Rank, index, signature and nature of the Quadratic form.

Applications: Finding Inverse and powers of a matrix by using Cayley-Hamilton theorem.

**UNIT III: Multiple integrals**

Multiple integrals - Double and triple integrals – Change of variables – Change of order of Integration

Application: Applications of Integration to Lengths, Volumes and Surface areas of solids of revolution in Cartesian and Polar Coordinates.

**UNIT IV: Special functions**

Beta and Gamma functions- Properties - Relation between Beta and Gamma functions

Application: Evaluation of improper integrals.

**UNIT V: Vector Differentiation**

Gradient- Divergence- Curl - Laplacian and second order operators -Vector identities

Application: Equation of continuity, potential surfaces

**UNIT VI: Vector Integration**

Line integral – work done – Potential function – area- surface and volume integrals Vector integral theorems: Greens, Stokes and Gauss Divergence Theorems (without proof) and related problems.

Application: Work done by a force

**Books:**

1. **B.S. GREWAL**, Higher Engineering Mathematics, 42nd Edition, Khanna Publishers
2. **B.V. RAMANA**, Higher Engineering Mathematics, Tata McGraw Hill

**Reference Books:**

1. **ERWIN KREYSZIG**, Advanced Engineering Mathematics, 9th Edition, Wiley-India
2. **S. S. SASTRI (PHI),** Introductory Methods of Numerical Analysis.
3. **V. RAVINDRANADH, P. VIJAYA LAXMI,** A Text Book on Mathematical Methods by Himalaya Publishing House.