



*Department of*  
**MECHANICAL ENGINEERING**

*Zakura Campus* **Institute of Technology, University of Kashmir**

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**M.Tech Entrance Test 2026 (Syllabus) -Non-GATE**

**Section 1: Engineering Mathematics**

Linear Algebra includes matrices, systems of equations, eigenvalues and eigenvectors. Calculus covers limits, continuity, differentiation, integration (single and multiple), series, maxima and minima, and vector calculus. Differential Equations include first and higher-order equations, Laplace transforms, and basic partial differential equations. Complex Variables deal with analytic functions, Cauchy–Riemann equations, and series. Probability and Statistics include probability laws, random variables, mean, standard deviation, and distributions. Numerical Methods involve solving equations, numerical integration, and methods for differential equations.

**Section 2: Applied Mechanics and Design**

Engineering Mechanics includes forces, equilibrium, friction, trusses, motion, and energy methods. Mechanics of Materials covers stress–strain, bending, torsion, columns, thermal stress, and material testing. Theory of Machines includes mechanisms, cams, gears, flywheels, governors, balancing, and gyroscope. Vibrations cover free and forced vibrations, damping, and resonance. Machine Design includes failure theories, fatigue, and design of joints, shafts, gears, bearings, and springs.

**Section 3: Fluid Mechanics and Thermal Sciences**

Fluid Mechanics includes fluid properties, statics, flow equations, Bernoulli's principle, pipe flow, and boundary layer. Heat Transfer covers conduction, convection, radiation, and heat exchangers. Thermodynamics includes laws, properties, cycles, and energy analysis. Applications include power plants, IC engines, refrigeration and air-conditioning, and turbomachinery.

## **Section 4: Materials, Manufacturing and Industrial Engineering**

Engineering Materials include structure, properties, phase diagrams, and heat treatment. Manufacturing Processes include casting, forming, welding, machining, and CNC. Metrology covers measurement systems, tolerances, and inspection methods. Computer Integrated Manufacturing includes CAD/CAM and additive manufacturing. Production Planning and Control includes forecasting, scheduling, MRP, and lean manufacturing. Inventory Control includes inventory models and safety stock. Operations Research includes optimization, linear programming, network analysis, and PERT and CPM.