



**Dr. D. Y. Patil Unitech Society**

(Recognised by UGC & Established under Govt. of Maharashtra Act No. 20 of 2024)

## **Syllabus for DPAT 2026**

**Programme: B. Tech (CSE, AI & ML, Cybersecurity, Electronic and Computer Engineering, Mechanical Engineering)**

### **Physics Syllabus**

- **Scalar Quantities and Vector Quantities**  
**Force:** Centripetal Force, Centrifugal Force, Moment of Force, Equilibrium  
Fraction in Solids and Liquids: Kinetic, Static
- **Refraction of Light, Seed of Light in Different Medium:** Refraction Laws, Snell's Law, Absolute Refraction Index, Angle of Refraction, Internal Refraction, Optical Fibre, Convex Lens
- **Magnetic Effect of Electric Current:** Magnetism, Attractive Property, Directive Properties, Intensity
- **Motion:** Motion, Circular Motion, Wave Motion, Rotational Motion, Uniform Speed
- **Gravitation:** Value of G, Gravitational Force and Weight
- **Oscillations:** Simple Harmonic Motion
- **Elasticity:** Elastic Limit or Maximum Value of Deforming Force, Stress, Strain, Hooke's Law
- **Surface Tension:** Cohesive Force, Adhesive Force, Capillarity, Illustrations
- **Stationary Waves:** Wave Theory and Formulas  
Kinetic Theory  
Interference and Diffractions
- **Electrostatics and Current Electricity:** Magnetic Effects of Electric Current, Electromagnetic Inductions  
Magnetism  
Electrons and Photons, Atoms, Molecules, and Nuclei  
Semiconductors  
Communication Systems

## Chemistry Syllabus

- **Ionic Equilibria:** Acids, bases, pH scale and buffer solutions.
- **Electrochemistry:** Redox reactions, conductance, electrochemical cells, Nernst equation, and Kohlrausch's law.
- **Chemical Kinetics:** Rate of reaction, order, molecularity, activation energy and Arrhenius equation.
- **Transition and Inner Transition Elements:** d-block and f -block properties, oxidation states and reactions of  $\text{KMnO}_4$  and  $\text{K}_2\text{Cr}_2\text{O}_7$ .
- **Alcohols, Phenols, and Ethers:** Classification, preparation, physical properties and specific reactions.
- **Aldehydes, Ketones, and Carboxylic Acids:** Preparation, Carbonyl reactions and name reactions.
- **Polymer Chemistry:** Classification and polymerization reactions.
- **Green Chemistry and Nanochemistry:** Principles of green chemistry and nano - materials.

## Mathematics Syllabus

### Unit I: Algebra and Mathematical Foundations

Mathematical Logic Statements, Matrices, Complex Numbers, Functions, Permutations and Combinations, Trigonometry, Trigonometric Functions, Bernoulli Trials and Binomial Distribution, Probability and Statistics.

### Unit II: Coordinate Geometry and Three -Dimensional Geometry

Straight Line, Pair of Straight Lines, Circle, Line, Conic Sections (Conics), Vectors, Three -Dimensional Geometry, and Plane.

### Unit III: Differential Calculus and Its Applications

Limits, Continuity, Differentiation, Applications of Derivatives, and Differential Equations.

### Unit IV: Integral Calculus and Optimization Techniques

Integration, Applications of Definite Integrals, and Linear Programming Problems.