SYLLABUS *For* Admission Test (2 Year Course)

2 Year Course (For IIT-JEE)

MATHEMATICS
- Real Numbers ◦ Rational numbers ◦ Number system ◦ Profit and loss ◦ Percentage ◦ Polynomials
- Linear equation in two variables ◦ Lines and angles ◦ Triangles ◦ Quadrilaterals ◦ Parallelograms
- Triangles ◦ Circles ◦ Area related to Circles ◦ Heron's Formula ◦ Surface Areas ◦ Volumes ◦ Statistics
- Quadratic Equations ◦ Arithmetic Progressions ◦ Trigonometry ◦ Heights and Distances ◦ Coordinate Geometry ◦ Probability

SCIENCE
- Motion ◦ Force ◦ Laws of Motion ◦ Gravitation ◦ Work and energy ◦ Sound ◦ Electricity ◦ Magnetic effects of electricity ◦ Light ◦ Human Eye ◦ Matter in our surroundings ◦ Is matter around us pure
- Chemical reactions & equations ◦ Acid base & salts ◦ Metals & non-metals ◦ Carbon & its compounds
- Periodic Classification of elements

Mental aptitude test (Mathematical Reasoning)

2 Year Course (For MEDICAL)

CHEMISTRY
Chemical Substances - Nature and Behaviour

- **Chemical reactions:** Chemical equation, Balanced chemical equation, implications of a balanced chemical equation, types of chemical reactions: combination, decomposition, displacement, double displacement, precipitation, neutralization, oxidation and reduction.

- **Acids, bases and salts:** Their definitions in terms of furnishing of H+ and OH- ions, General properties, examples and uses, concept of pH scale(Definition relating to logarithm not required), importance of pH in everyday life; preparation and uses of sodium hydroxide, Bleaching powder, Baking soda, Washing soda and Plaster of Paris.

- **Metals and non metals:** Properties of metals and non-metals, reactivity series, formation and properties of ionic compounds, basic metallurgical processes, corrosion and its prevention.

- **Carbon compounds:** Covalent bonding in carbon compounds. Versatile nature of carbon. Homologous series Nomenclature of carbon compounds containing functional groups (halogens, alcohol, ketones, aldehydes, alkanes and alkynes), difference between saturated hydrocarbons and unsaturated hydrocarbons. Chemical properties of carbon compounds (combustion, oxidation, addition and substitution reaction). Ethanol and Ethanoic acid (only properties and uses), soaps and detergents.

- **Periodic classification of elements:** Need for classification, Modern periodic table, gradation in properties, valency, atomic number, metallic and non-metallic properties.

BIOLOGY
Living World
- **Life processes:** "living being". Basic concept of nutrition, respiration, transport and excretion in plants and animals.
- **Control and co-ordination in animals and plants:** Tropic movements in plants; Introduction to plant hormones; control and co-ordination in animals : nervous system; voluntary, involuntary and reflex action, chemical co-ordination: animal hormones.
- **Reproduction:** Reproduction in animal and plants (asexual and sexual) reproductive health-need for and methods of family planning. safe sex vs HIV/AIDS. Child bearing and women's health.
- **Heredity and evolution:** Heredity; Mendel's contribution- Laws for inheritance of traits: Sex determination: brief introduction; Basic concepts of evolution.

Natural Resources
- **Sources of energy:** Different forms of energy, conventional and non-conventional sources of energy: fossil fuels, solar energy; biogas; wind, water and tidal energy; nuclear energy. Renewable versus non-renewable sources.
- **Our environment:** Eco-system, Environmental problems, Ozone depletion, waste production and their solutions. Biodegradable and non-biodegradable substances.
- **Management of natural resources:** Conservation and judicious use of natural resources. Forest and wild life; Coal and Petroleum conservation. Examples of people's participation for conservation of natural resources. Big dams: advantages and limitations; alternatives, if any. Water harvesting. Sustainability of natural resources.

PHYSICS
Natural Phenomenon
- Reflection of light at curved surfaces, Images formed by spherical mirrors, centre of curvature, principal axis, principal focus, focal length, mirror formula (Derivation not required), magnification.
- Refraction; laws of refraction, refractive index.
- Refraction of light by spherical lens, Image formed by spherical lenses, Lens formula (Derivation not required), Magnification. Power of a lens.
- Functioning of a lens in human eye, defects of vision and their corrections, applications of spherical mirrors and lenses.
- Refraction of light through a prism, dispersion of light, scattering of light, applications in daily life.

Effects of Current
- **Electric current, potential difference and electric current:** Ohm's law; Resistance, Resistivity, Factors on which the resistance of a conductor depends. Series combination of resistors, parallel combination of resistors and its applications in daily life. Heating effect of electric current and its applications in daily life. Electric power, Inter relation between P, V, I and R.
- **Magnetic effects of current:** Magnetic field, field lines, field due to a current carrying conductor, field due to current carrying coil or solenoid; Force on current carrying conductor, Fleming's left hand rule. Electromagnetic induction. Induced potential difference, Induced current. Fleming's Right Hand Rule, Direct current. Alternating current : frequency of AC. Advantage of AC over DC. Domestic electric circuits.

MENTAL APTITUDE TEST

SYLLABUS *For* Admission Test (1 YEAR COURSE)

1 Year Course For 12th PASS Students (For **IIT-JEE**)

PHYSICS
- Electrostatics
- DC Circuits
- Capacitance
- Magnetic Effects of Current
- EMI
- Physics of Atom and Nucleus
- Geometrical Optics

CHEMISTRY
- Solid State
- Electrochemistry
- Complete Organic Chemistry (XI-XII)
- Atomic Structure
- Periodic Table
- Chemical Bonding
- Chemical Kinetics
- Energetics
- Solutions
- Gas Laws
- Gravimetric and Volumetric Analysis

MATHEMATICS
- Limits
- Continuity
- Differentiability
- Differentiation and its Applications
- Indefinite and Definite Integration
- Area under Curves
- Vectors
- 3D Co-ordinate Geometry
- Differential Equations
- Probability

1 Year Course For 12th PASS Students (For **MEDICAL**)

PHYSICS
- Electrostatics
- Current Electricity
- Magnetic Effects of Current and Magnetism
- Electromagnetic Induction & Alternating Currents
- Electromagnetic Waves
- Optics
- Dual Nature of Matter and Radiation
- Atoms and Nuclei
- Electronic Devices

CHEMISTRY
- Solid State
- Solutions
- Electrochemistry
- Chemical Kinetics
- Surface Chemistry
- General Principles & Processes of Isolation of Elements
- *p*-Block Elements
- *d* and *f* Block Elements
- Coordination Compounds
- Haloalkanes and Haloarenes
- Alcohols, Phenols and Ethers
- Aldehydes, Ketones and Carboxylic Acids
- Organic Compounds Containing Nitrogen
- Biomolecules
- Polymers
- Chemistry in Everyday Life

BIOLOGY
- Reproduction
- Genetics and Evolution
- Biology and Human Welfare
- Biotechnology and Its Applications
- Ecology and environment