VMC Vidyamandir Classes SINCE 1986
IIT JEE | MEDICAL | FOUNDATION

SYLLABUS FOR NATIONAL ADMISSION TEST - MARCH / APRIL 2020

IIT-JEE COURSES

1 Year Course (For IIT-JEE 2021)

PHYSICS
Units and Measurements, Vectors, Kinematics of a Particle, Motion in Two Dimensions, Dynamics of a Particle, Energy and Momentum, Rotation, Gravitation, Properties of Matter, Liquid, Thermodynamics, SHM, Waves

CHEMISTRY
Stoichiometry, Atomic Structure, Periodicity, Chemical Bonding, States of Matter, Thermochemistry, Thermodynamics, Chemical and Ionic Equilibrium, General Organic Chemistry, Redox Reactions, Hydrogen, s-block elements, p-block elements, Hydrocarbons, Environmental Chemistry

MATH
Sets, Relations, Functions, Quadratic Equations, Trigonometry, Sequence and Series, Complex Numbers, Binomial Theorem, Permutation and Combination, Straight Lines, Circles, Conic Sections

PATTERN **Physics:** 25 Questions | **Chemistry:** 25 Questions | **Math:** 25 Questions

2 Year Course (For IIT-JEE 2022)

MAT
Verbal and Non-Verbal Series, Logical Sequence of Words, Verbal and Non-Verbal Analogy, Coding and Decoding, Arithmetical Reasoning, Alphabet Test, Puzzle Test, Mirror Images, Analytical Reasoning, Blood Relation, Dice and Cube, Grouping of Identical Figures, Calendar, Logical Venn Diagrams, Clock, Verbal and Non-Verbal Classification, Paper Folding and Paper Cutting, Ranking and Time Sequence, Figure Matrix, Data Sufficiency

SCIENCE
Motion, Force, Laws of Motion, Gravitation, Work and Energy, Sound, Electricity, Magnetic Effects of Electricity, Sources of Energy, Light – Reflection and Refraction, Matter, Structure of Atom, Atoms and Molecules, Chemical Reactions and Equations, Acid Base and Salts, Metals and Non-Metals, Carbon and its Compounds, Periodic Classification of Elements

MATH
Real Numbers, Rational Numbers, Number System, Profit and Loss, Percentage, Polynomials, Linear Equation in Two Variables, Lines and Angles, Triangles, Quadrilaterals, Parallelograms, Triangles, Circles and Area Related to Circles, Heron's Formula, Surface Areas, Volumes, Statistics, Quadratic Equations, Arithmetic Progressions, Trigonometry and Its Applications, Probability, Coordinate Geometry

PATTERN **MAT:** 10 Questions | **Science:** 15 Questions | **Math:** 25 Questions | **Math (Application Based):** 10 Questions

MEDICAL COURSES

1 Year Course (For MEDICAL 2021)

PHYSICS
Physical world and measurement, Units and Dimensions including Error, Motion along a straight line, Motion in a plane, Laws of Motion, Work energy and Power, System of particles and rotational motion, Gravitation, Mechanical properties of solids, Mechanical properties of Liquid, Thermal Properties of Matter

CHEMISTRY
Some basic Concept of chemistry, Structure of Atoms, Periodic Properties of Elements, Chemical Bonding & Molecular Stricture, States of Matter, Chemical Thermodynamics, Chemical Equilibrium, Redox reactions, Ionic Equilibrium

BIOLOGY
The Living World, Biological Classification, Plant Kingdom, Animal Kingdom, Morphology of Flowering Plants, Anatomy of Flowering Plants, Structural Organization in Animals, Cell-The Unit of Life, Biomolecules, Cell Cycle and Cell Division, Transport in Plants, Mineral Nutrition, Digestion and Absorption, Breathing and Exchange of Gases, Body Fluids and Circulation

PATTERN **Physics:** 30 Questions | **Chemistry:** 30 Questions | **Botany:** 30 Questions | **Zoology:** 30 Questions

2 Year Course (For MEDICAL 2022)

UNIT I: 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.

UNIT II: WORLD OF LIVING

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. Childbearing and women's health.

Heredity and evolution: Heredity; Mendel's contribution- Laws for inheritance of traits: Sex determination: brief introduction; Basic concepts of evolution.

UNIT III: 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.

UNIT IV: 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.

UNIT V: 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 wildlife; 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.

MENTAL ABILITY TEST The mental ability test is to judge your power of reasoning, logical sequencing, reading comprehension.

PATTERN **Physics:** 35 Questions | **Chemistry:** 35 Questions | **Biology:** 35 Questions | **Mental Ability:** 15 Questions

FOUNDATION COURSES

3 Year Foundation Course (2023)

MAT

Verbal and Non-Verbal Series, Logical Sequence of Words, Verbal and Non-Verbal Analogy, Coding and Decoding, Arithmetical Reasoning, Alphabet Test, Puzzle Test, Mirror Images, Analytical Reasoning, Blood Relation, Dice and Cube, Grouping of Identical Figures, Calendar, Logical Venn Diagrams, Clock, Verbal and Non-Verbal Classification, Paper Folding and Paper Cutting, Ranking and Time Sequence, Figure Matrix, Data Sufficiency.

SCIENCE

Motion, Force, Laws of Motion, Gravitation, Fluids, Work & Energy, Sound, Matter in our Surroundings, Is Matter Around Us Pure, Atoms and Molecules, Structure of Atom, Cells, Tissues, Diversity in Living Organism, Why Do We Fall Ill?, Natural Resources, Improvement in Food Resources

MATH

Rational Numbers, Linear Equation in One Variable, Quadrilaterals, Square and Square Roots, Cube and Cube Roots, Factorization, Direct and Inverse Proportion, Comparing Quantities, Algebraic Expressions and Identities, Mensuration, Exponent and Powers, Number System, Polynomials, Linear Equation in Two Variables, Lines and Angles, Triangles, Profit and Loss, Percentage, Area and Parallelograms and Triangles, Circles, Heron's Formula, Surface Areas and Volumes, Probability, Statistics, Coordinate Geometry

PATTERN **MAT:** 10 Questions | **Science:** 15 Questions | **Math:** 35 Questions

4 Year Foundation Course (2024)

MAT

Verbal and Non-Verbal Series, Logical Sequence of Words, Verbal and Non-Verbal Analogy, Coding and Decoding, Arithmetical Reasoning, Alphabet Test, Puzzle Test, Mirror Images, Analytical Reasoning, Blood Relation, Dice and Cube, Grouping of Identical Figures, Calendar, Logical Venn Diagrams, Clock, Verbal and Non-Verbal Classification, Paper Folding and Paper Cutting, Ranking and Time Sequence, Figure Matrix, Data Sufficiency

SCIENCE

Crop Production and Management, Micro Organisms, Conservation of Plants and Animals, Cells, Reproduction, Force and Pressure, Friction, Sound, Synthetic Fibers and Plastics, Metals and Non-Metals, Coal and Petroleum, Combustion and Flame, Chemical Effects of Electric Current, Reaching The Age of Adolescence, Natural Phenomenon, Light, Star & Solar System, Pollution of Air & Water

MATH

Fractions and Decimals, Simple Equations, Lines and Angles, Triangles, Congruence of Triangles, Comparing Quantities, Rational Numbers, Perimeter and Area, Algebraic Expressions, Exponents and Powers, Linear Equations in One Variable, Quadrilaterals, Square and Square Roots, Cube and Cube Roots, Factorization, Profit and loss, Percentage, Mensuration, Direct & Inverse Proportions, Data Handling

PATTERN **MAT:** 10 Questions | **Science:** 15 Questions | **Math:** 35 Questions

5 (1+4) Year Foundation Course (2025)

MAT

Verbal and Non-Verbal Series, Logical Sequence of Words, Verbal and Non-Verbal Analogy, Coding and Decoding, Arithmetical Reasoning, Alphabet Test, Puzzle Test, Mirror Images, Analytical Reasoning, Blood Relation, Dice and Cube, Grouping of Identical Figures, Calendar, Logical Venn Diagrams, Clock, Verbal and Non-Verbal Classification, Paper Folding and Paper Cutting, Ranking and Time Sequence, Figure Matrix, Data Sufficiency

SCIENCE

Nutrition in Plants, Nutrition in Animals, Fiber to Fabric, Heat, Acids, Bases & Salts, Physical & Chemical Changes, Weather Climate & Adaption of Animals to Climate, Winds Storms & Cyclones, Soil, Motion &Time, Electric Current and Its Effects, Water a Precious Resource, Respiration in Organisms, Transportation in Plants and Animals, Reproduction in Plants, Forests

MATH

Integers, Fractions & Decimals, Simple Equations, Lines & Angles, Triangle & Its Properties, Congruence of Triangles, Algebraic Expressions, Exponents & Powers, Symmetry, Comparing Quantities, Rational Numbers, Perimeter & Area

PATTERN **MAT:** 10 Questions | **Science:** 15 Questions | **Math:** 35 Questions

DROPPER'S

1 Year Course for 12th PASS Students (For IIT-JEE 2021)

PHYSICS

Electrostatics, DC Circuits, Capacitance, Magnetic Effects of Current, EMI, Physics of Atom and Nucleus, Geometrical Optics, Solids & Semiconductor, Principle of Communication

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

MATH

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 2021)

PHYSICS

Electrostatics, DC Circuits, Capacitance, Magnetic Effects of Current, EMI, Physics of Atom and Nucleus, Geometrical Optics, Solids & Semiconductor, Principle of Communication

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