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What is JEE Main Syllabus?

JEE Main Syllabus is based on topics from Class 11th and 12th CBSE/ NCERT syllabus. JEE Main Syllabus PDF for Paper 1 (B.E./B.Tech) is based on topics from Physics, Chemistry and Mathematics. The syllabus of JEE Main Paper 2 (B.Arch/ B.Planning) is based on topics from Mathematics, Aptitude Test and Drawing/ Planning.

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Knowing the detailed syllabus of JEE Main exam will help in developing a strong preparation strategy and gaining valuable insights into the latest **JEE Main Exam Pattern**. Candidates can use the links below in the article for JEE Main Syllabus with Weightage PDF download for Physics, Chemistry and Mathematics.

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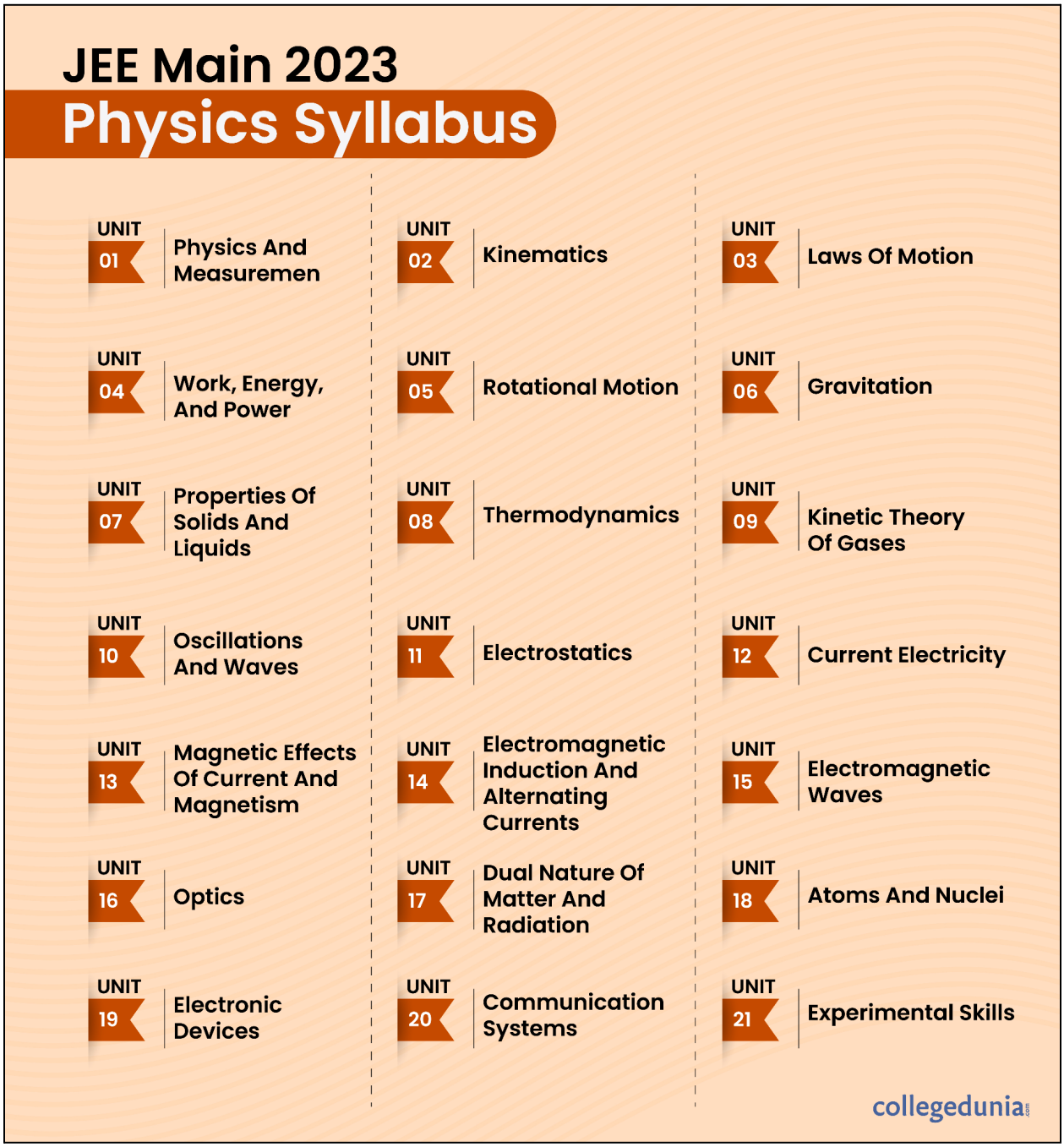
JEE Main Syllabus for B.E./B.Tech

JEE Main Syllabus for B.E./B.Tech includes topics from Physics, Chemistry and Mathematics carrying an equal website of 33.33%. A strong understanding of concepts from NCERT books of CBSE Class 11th and 12th is important to crack JEE Main Paper 1. **JEE Main B.E./B.Tech Question Paper consists of Section A with 20 MCQs and Section B with 10 numerical value questions of which candidates have to attempt any 5**.

JEE Main Syllabus of Physics

- **JEE Main Syllabus of Physics** constitutes 21 units/ topics. The topics from the theory have a weightage of 80% while topics from the practical section have a weightage of 20%.
- JEE Main Physics often comes across as tricky and mostly based on concepts.



Topics	Sub-Topics
UNIT 1: PHYSICS AND MEASUREMENT	Physics, technology, and society, S I Units, fundamental and derived units, least count, accuracy and precision of measuring instruments, Errors in measurement, Dimensions of Physics quantities, dimensional analysis, and its applications.
UNIT 2: KINEMATICS	The frame of reference, motion in a straight line, Position- time graph, speed and velocity; Uniform and non-uniform motion, average speed and instantaneous velocity, uniformly

	accelerated motion, velocity-time, position-time graph, relations for uniformly accelerated motion, Scalars and Vectors, Vector. Addition and subtraction, zero vector, scalar and vector products, Unit Vector, Resolution of a Vector. Relative Velocity, Motion in a plane, Projectile Motion, Uniform Circular Motion.
UNIT 3: LAWS OF MOTION	Force and inertia, Newton's First law of motion; Momentum, Newton's Second Law of motion, Impulses; Newton's Third Law of motion. Law of conservation of linear momentum and its applications. Equilibrium of concurrent forces. Static and Kinetic friction, laws of friction, rolling friction. Dynamics of uniform circular motion: centripetal force and its applications.
UNIT 4: WORK, ENERGY, AND POWER	Work done by a content force and a variable force; kinetic and potential energies, work-energy theorem, power. The potential energy of spring conservation of mechanical energy, conservative and neoconservative forces; Elastic and inelastic collisions in one and two dimensions.
UNIT5: ROTATIONAL MOTION	Centre of the mass of a two-particle system, Centre of the mass of a rigid body; Basic concepts of rotational motion; a moment of a force; torque, angular momentum, conservation of angular momentum and its applications; the moment of inertia, the radius of gyration. Values of moments of inertia for simple geometrical objects, parallel and perpendicular axes theorems, and their applications. Rigid body rotation equations of rotational motion.
UNIT 6: GRAVITATION	The universal law of gravitation. Acceleration due to gravity and its variation with altitude and depth. Kepler's law of planetary motion. Gravitational potential energy; gravitational potential. Escape velocity, Orbital velocity of a satellite. Geo stationary satellites.
UNIT 7: PROPERTIES OF SOLIDS AND LIQUIDS	Elastic behavior, Stress-strain relationship, Hooke's Law. Young's modulus, bulk modulus, modulus of rigidity. Pressure due to a fluid column; Pascal's law and its applications. Viscosity. Stokes' law. terminal velocity, streamline, and turbulent flow. Reynolds number. Bernoulli's principle and its applications. Surface energy and surface tension, angle of contact, application of surface tension - drops, bubbles, and capillary rise. Heat, temperature, thermal expansion; specific

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	heat capacity, calorimetry; change of state, latent heat. Heat transfer-conduction, convection, and radiation. Newton's law of cooling.
UNIT 8: THERMODYNAMICS	Thermal equilibrium, zeroth law of thermodynamics, the concept of temperature. Heat, work, and internal energy. The first law of thermodynamics. The second law of thermodynamics: reversible and irreversible processes. Carnot engine and its efficiency.
UNIT 9: KINETIC THEORY OF GASES	Equation of state of a perfect gas, work done on compressing a gas, Kinetic theory of gases - assumptions, the concept of pressure. Kinetic energy and temperature: RMS speed of gas molecules: Degrees of freedom. Law of equipartition of energy, applications to specific heat capacities of gases; Mean free path. Avogadro's number.
UNIT 10: OSCILLATIONS AND WAVES	Periodic motion - period, frequency, displacement as a function of time. Periodic functions. Simple harmonic motion (S.H.M.) and its equation; phase: oscillations of a spring -restoring force and force constant: energy in S.H.M. - Kinetic and potential energies; Simple pendulum - derivation of expression for its time period: Free, forced and damped oscillations, resonance. Wave motion. Longitudinal and transverse waves, speed of a wave. Displacement relation for a progressive wave. Principle of superposition of waves, a reflection of waves. Standing waves in strings and organ pipes, fundamental mode and harmonics. Beats. Doppler Effect in sound
UNIT 11: ELECTROSTATICS	Electric charges: Conservation of charge. Coulomb's law forces between two point charges, forces between multiple charges: superposition principle and continuous charge distribution. Electric field: Electric field due to a point charge, Electric field lines. Electric dipole, Electric field due to a dipole. Torque on a dipole in a uniform electric field. Electric flux. Gauss's law and its applications to find field due to infinitely long uniformly charged straight wire, uniformly charged infinite plane sheet, and uniformly charged thin spherical shell. Electric potential and its calculation for a point charge, electric dipole and system of charges; Equipotential surfaces, Electrical potential energy of a system of two point charges in an electrostatic field.

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	Conductors and insulators. Dielectrics and electric polarization, capacitor, the combination of capacitors in series and parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates. Energy stored in a capacitor
UNIT 12: CURRENT ELECTRICITY	Electric current. Drift velocity. Ohm's law. Electrical resistance. Resistances of different materials. V-I characteristics of Ohmic and non-ohmic conductors. Electrical energy and power. Electrical resistivity. Colour code for resistors; Series and parallel combinations of resistors; Temperature dependence of resistance. Electric Cell and its Internal resistance, potential difference and emf of a cell, a combination of cells in series and parallel. Kirchhoff’s laws and their applications. Wheatstone bridge. Metre Bridge. Potentiometer - principle and its applications.
UNIT 13: MAGNETIC EFFECTS OF CURRENT AND MAGNETISM	Biot - Savart law and its application to current carrying circular loop. Ampere's law and its applications to infinitely long current carrying straight wire and solenoid. Force on a moving charge in uniform magnetic and electric fields. Cyclotron. Force on a current-carrying conductor in a uniform magnetic field. The force between two parallel currents carrying conductors-definition of ampere. Torque experienced by a current loop in a uniform magnetic field: Moving coil galvanometer, its current sensitivity, and conversion to ammeter and voltmeter. Current loop as a magnetic dipole and its magnetic dipole moment. Bar magnet as an equivalent solenoid, magnetic field lines; Earth's magnetic field and magnetic elements. Para-, dia- and ferromagnetic substances. Magnetic susceptibility and permeability. Hysteresis. Electromagnets and permanent magnets.
UNIT 14: ELECTROMAGNETIC INDUCTION AND ALTERNATING CURRENTS	Electromagnetic induction: Faraday's law. Induced emf and current: Lenz’s Law, Eddy currents. Self and mutual inductance. Alternating currents, peak and RMS value of alternating current/ voltage: reactance and impedance: LCR series circuit, resonance: Quality factor, power in AC circuits, wattless current. AC generator and transformer.

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UNIT 15: ELECTROMAGNETIC WAVES	Electromagnetic waves and their characteristics, Transverse nature of electromagnetic waves, Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet. X-rays. Gamma rays), Applications of e.m. waves.
UNIT 16: OPTICS	Reflection and refraction of light at plane and spherical surfaces, mirror formula. Total internal reflection and its applications. Deviation and Dispersion of light by a; prism; Lens Formula. Magnification. Power of a Lens. Combination of thin lenses in contact. Microscope and Astronomical Telescope (reflecting and refracting) and their magnifying powers. Wave optics: wavefront and Huygens' principle. Laws of reflection and refraction using Huygens principle. Interference, Young's double-slit experiment and expression for fringe width, coherent sources, and sustained interference of light. Diffraction due to a single slit, width of central maximum. Resolving power of microscopes and astronomical telescopes. Polarization, plane-polarized light: Brewster's law, uses of plane-polarized light and Polaroid.
UNIT 17: DUAL NATURE OF MATTER AND RADIATION	Dual nature of radiation. Photoelectric effect. Hertz and Lenard's observations; Einstein's photoelectric equation: particle nature of light. Matter waves-wave nature of particle, de Broglie relation. Davisson-Germer experiment.
UNIT 18: ATOMS AND NUCLEI	Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum. Composition and size of nucleus, atomic masses, isotopes, isobars: isotones. Radioactivity- alpha. beta and gamma particles/rays and their properties; radioactive decay law. Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number, nuclear fission, and fusion.
UNIT 19: ELECTRONIC DEVICES	Semiconductors; semiconductor diode: 1-V characteristics in forward and reverse bias; diode as a rectifier; I-V characteristics of LED. the photodiode, solar cell, and Zener diode; Zener diode as a voltage regulator. Junction transistor, transistor action, characteristics of a transistor: transistor as an amplifier (common emitter configuration) and oscillator. Logic gates (OR. AND. NOT. NAND and NOR). Transistor as a switch.

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UNIT 20: COMMUNICATION SYSTEMS	Propagation of electromagnetic waves in the atmosphere; Sky and space wave propagation. Need for modulation. Amplitude and Frequency Modulation, Bandwidth of signals. the bandwidth of Transmission medium, Basic Elements of a Communication System (Block Diagram only).
UNIT 21: EXPERIMENTAL SKILLS	Familiarity with the basic approach and observations of the experiments and activities: 1. Vernier calipers-its use to measure the internal and external diameter and depth of a vessel. 2. Screw gauge-its use to determine thickness/ diameter of thin sheet/wire. 3. Simple Pendulum-dissipation of energy by plotting a graph between the square of amplitude and time. 4. Metre Scale - the mass of a given object by the principle of moments. 5. Young's modulus of elasticity of the material of a metallic wire. 6. Surface tension of water by capillary rise and effect of detergents, 7. Co-efficient of Viscosity of a given viscous liquid by measuring terminal velocity of a given spherical body, 8. Plotting a cooling curve for the relationship between the temperature of a hot body and time. 9. Speed of sound in air at room temperature using a resonance tube, 10. Specific heat capacity of a given (i) solid and (ii) liquid by method of mixtures. 11. The resistivity of the material of a given wire using a metre bridge. 12. The resistance of a given wire using Ohm's law. 13. Potentiometeri. Comparison of emf of two primary cells. ii. Determination of internal resistance of a cell. 14. Resistance and figure of merit of a galvanometer by half deflection method. 15. The focal length of; (i) Convex mirror (ii) Concave mirror, and (ii) Convex lens, using the parallax method. 16. The plot of the angle of deviation vs angle of incidence for a triangular prism. 17. Refractive index of a glass slab using a travelling microscope.

	18. Characteristic curves of a p-n junction diode in forward and reverse bias. 19. Characteristic curves of a Zener diode and finding reverse break down voltage. 20. Characteristic curves of a transistor and finding current gain and voltage gain. 21. Identification of Diode. LED, Transistor. IC. Resistor. A capacitor from a mixed collection of such items. 22. Using a multimeter to: (i) Identify the base of a transistor (ii) Distinguish between NPN and PNP type transistor (iii) See the unidirectional current in case of a diode and an LED. (iv) Check the correctness or otherwise of a given electronic component (diode, transistor, or IC).

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How to Ace JEE Main Physics?	JEE Main Physics Pattern- What's New?

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JEE Main Syllabus of Chemistry

- **JEE MainChemistry Syllabus** consists of topics from Physical, Inorganic and Organic Chemistry.
  - Physical Chemistry includes 10 major topics,
  - Inorganic Chemistry includes 8 major topics, and
  - Organic Chemistry also includes 10 major topics.
- The chemistry section is often reported by candidates to be the easiest, most time-saving and scoring among the three sections of JEE Main B.E./B.Tech paper.

JEE Main 2023
Chemistry Syllabus

PHYSICAL CHEMISTRY

- UNIT 01 — Some Basic Concepts In Chemistry
- UNIT 02 — States Of Matter
- UNIT 03 — Atomic Structure
- UNIT 04 — Chemical Bonding And Molecular Structure
- UNIT 05 — Chemical Thermodynamics
- UNIT 06 — Solutions
- UNIT 07 — Equilibrium
- UNIT 08 — Redox Reactions And Electrochemistry
- UNIT 09 — Chemical Kinetics
- UNIT 10 — Surface Chemistry

INORGANIC CHEMISTRY

- UNIT 11 — Classification Of Elements And Periodicity In Properties
- UNIT 12 — General Principles And Processes Of Isolation Of Metals
- UNIT 13 — Hydrogen
- UNIT 14 — S -block Elements (Alkali And Alkaline Earth Metals)
- UNIT 15 — P- Block Elements
- UNIT 16 — D - And F- Block Elements
- UNIT 17 — Co-ordination Compounds
- UNIT 18 — Environmental Chemistry

ORGANIC CHEMISTRY

- UNIT 19 — Purification And Characterisation Of Organic Compounds
- UNIT 20 — Some Basic Principles Of Organic chemistry
- UNIT 21 — Hydrocarbons
- UNIT 22 — Organic Compounds Containing Halogens
- UNIT 23 — Organic Compounds Containing Oxygen

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Topics	Sub-Topics
PHYSICAL CHEMISTRY	
UNIT I: SOME BASIC CONCEPTS IN CHEMISTRY	Matter and its nature, Dalton's atomic theory: Concept of atom, molecule, element, and compound: Physical quantities and their measurements in Chemistry, precision, and accuracy, significant figures. S.I.Units, dimensional analysis: Laws of chemical combination; Atomic and molecular masses, mole concept, molar mass, percentage composition, empirical and molecular formulae: Chemical equations and stoichiometry.
UNIT 2: STATES OF MATTER	Classification of matter into solid, liquid, and gaseous states. Gaseous State: Measurable properties of gases: Gas laws - Boyle's law, Charle's law. Graham's law of diffusion. Avogadro's law, Dalton's law of partial pressure; Concept of Absolute scale of temperature; Ideal gas equation; Kinetic theory of gases (only postulates); Concept of average, root mean square and most probable velocities; Real gases, deviation from Ideal behaviour, compressibility factor, and van der Waals equation. Liquid State: Properties of liquids - vapour pressure, viscosity and surface tension, and effect of temperature on them (qualitative treatment only). Solid State: Classification of solids: molecular, ionic, covalent and metallic solids, amorphous and crystalline solids (elementary idea); Bragg's Law and its applications: Unit cell and lattices, packing in solids (fcc, bcc and hcp lattices), voids, calculations involving unit cell parameters, an imperfection in solids; Electrical and magnetic properties.
UNIT 3: ATOMIC STRUCTURE	Thomson and Rutherford atomic models and their limitations; Nature of electromagnetic radiation, photoelectric effect; Spectrum of the hydrogen atom. Bohr model of a hydrogen atom - its postulates, derivation of the relations for the energy of the electron and radii of the different orbits, limitations of Bohr's model; Dual nature of matter, de Broglie's relationship. Heisenberg uncertainty principle. Elementary ideas of quantum mechanics, quantum mechanics, the quantum

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	mechanical model of the atom, its important features. Concept of atomic orbitals as one-electron wave functions: Variation of and 2 with r for 1s and 2s orbitals; various quantum numbers (principal, angular momentum, and magnetic quantum numbers) and their significance; shapes of s, p, and d - orbitals, electron spin and spin quantum number: Rules for filling electrons in orbitals – Aufbau principle. Pauli's exclusion principle and Hund's rule, electronic configuration of elements, extra stability of half-filled and completely filled orbitals.
UNIT 4: CHEMICAL BONDING AND MOLECULAR STRUCTURE	Kossel - Lewis approach to chemical bond formation, the concept of ionic and covalent bonds. Ionic Bonding: Formation of ionic bonds, factors affecting the formation of ionic bonds; calculation of lattice enthalpy. Covalent Bonding: Concept of electronegativity. Fajan's rule, dipole moment: Valence Shell Electron Pair Repulsion (VSEPR) theory and shapes of simple molecules. Quantum mechanical approach to covalent bonding: Valence bond theory - its important features, the concept of hybridization involving s, p, and d orbitals; Resonance. Molecular Orbital Theory - Its important features. LCAOs, types of molecular orbitals (bonding, antibonding), sigma and pi-bonds, molecular orbital electronic configurations of homonuclear diatomic molecules, the concept of bond order, bond length, and bond energy. Elementary idea of metallic bonding. Hydrogen bonding and its applications.
UNIT 5: CHEMICAL THERMODYNAMICS	Fundamentals of thermodynamics: System and surroundings, extensive and intensive properties, state functions, types of processes. The first law of thermodynamics - Concept of work, heat internal energy and enthalpy, heat capacity, molar heat capacity; Hess's law of constant heat summation; Enthalpies of bond dissociation, combustion, formation, atomization, sublimation, phase transition, hydration, ionization, and solution. The second law of thermodynamics - Spontaneity of processes; S of the universe and G of the system as criteria for spontaneity. G (Standard Gibbs energy change) and equilibrium constant.

UNIT 6: SOLUTIONS	Different methods for expressing the concentration of solution - molality, molarity, mole fraction, percentage (by volume and mass both), the vapour pressure of solutions and Raoult's Law - Ideal and non-ideal solutions, vapour pressure - composition, plots for ideal and nonideal solutions; Colligative properties of dilute solutions - a relative lowering of vapour pressure, depression of freezing point, the elevation of boiling point and osmotic pressure; Determination of molecular mass using colligative properties; Abnormal value of molar mass, van't Hoff factor and its significance.
UNIT 7: EQUILIBRIUM	Meaning of equilibrium, the concept of dynamic equilibrium. Equilibria involving physical processes: Solid-liquid, liquid - gas and solid-gas equilibria, Henry's law. General characteristics of equilibrium involving physical processes. Equilibrium involving chemical processes: Law of chemical equilibrium, equilibrium constants (Kp and Kc) and their significance, the significance of G and G in chemical equilibrium, factors affecting equilibrium concentration, pressure, temperature, the effect of catalyst; Le Chatelier's principle. Ionic equilibrium: Weak and strong electrolytes, ionization of electrolytes, various concepts of acids and bases (Arrhenius. Bronsted - Lowry and Lewis) and their ionization, acid-base equilibria (including multistage ionization) and ionization constants, ionization of water. pH scale, common ion effect, hydrolysis of salts and pH of their solutions, the solubility of sparingly soluble salts and solubility products, buffer solutions.
UNIT 8: REDOX REACTIONS AND ELECTROCHEMISTRY	Electronic concepts of oxidation and reduction, redox reactions, oxidation number, rules for assigning oxidation number, balancing of redox reactions. Electrolytic and metallic conduction, conductance in electrolytic solutions, molar conductivities and their variation with concentration: Kohlrausch's law and its applications. Electrochemical cells - Electrolytic and Galvanic cells, different types of electrodes, electrode potentials including standard electrode potential, half - cell and cell reactions, emf of a Galvanic cell and its measurement: Nernst equation and its applications; Relationship between cell potential and

	Gibbs' energy change: Dry cell and lead accumulator; Fuel cells.
UNIT 9: CHEMICAL KINETICS	Rate of a chemical reaction, factors affecting the rate of reactions: concentration, temperature, pressure, and catalyst; elementary and complex reactions, order and molecularity of reactions, rate law, rate constant and its units, differential and integral forms of zero and first-order reactions, their characteristics and half-lives, the effect of temperature on the rate of reactions, Arrhenius theory, activation energy and its calculation, collision theory of bimolecular gaseous reactions (no derivation).
UNIT 10: SURFACE CHEMISTRY	Adsorption- Physisorption and chemisorption and their characteristics, factors affecting adsorption of gases on solids - Freundlich and Langmuir adsorption isotherms, adsorption from solutions. Catalysis - Homogeneous and heterogeneous, activity and selectivity of solid catalysts, enzyme catalysis, and its mechanism. Colloidal state- distinction among true solutions, colloids, and suspensions, classification of colloids - lyophilic. lyophobic; multi-molecular. macromolecular and associated colloids (micelles), preparation and properties of colloids - Tyndall effect. Brownian movement, electrophoresis, dialysis, coagulation, and flocculation: Emulsions and their characteristics.
INORGANIC CHEMISTRY	
UNIT 11: CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES	Modem periodic law and present form of the periodic table, s, p. d and f block elements, periodic trends in properties of elements atomic and ionic radii, ionization enthalpy, electron gain enthalpy, valence, oxidation states, and chemical reactivity.
UNIT 12: GENERAL PRINCIPLES AND PROCESSES OF ISOLATION OF METALS	Modes of occurrence of elements in nature, minerals, ores; Steps involved in the extraction of metals - concentration, reduction (chemical and electrolytic methods), and refining with special reference to the extraction of Al. Cu, Zn, and Fe; Thermodynamic and electrochemical principles involved in the extraction of metals.
UNIT 13: HYDROGEN	Position of hydrogen in periodic table, isotopes, preparation, properties and uses of hydrogen; Physical and chemical

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	properties of water and heavy water; Structure, preparation, reactions, and uses of hydrogen peroxide; Classification of hydrides - ionic, covalent, and interstitial; Hydrogen as a fuel.
UNIT 14: s -BLOCK ELEMENTS (ALKALI AND ALKALINE EARTH METALS)	Group -1 and 2 Elements General introduction, electronic configuration, and general trends in physical and chemical properties of elements, anomalous properties of the first element of each group, diagonal relationships. Preparation and properties of some important compounds - sodium carbonate and sodium hydroxide and sodium hydrogen carbonate; Industrial uses of lime, limestone. Plaster of Paris and cement: Biological significance of Na, K. Mg, and Ca.
UNIT 15: p- BLOCK ELEMENTS	Group -13 to Group 18 Elements General Introduction: Electronic configuration and general trends in physical and chemical properties of elements across the periods and down the groups; unique behaviour of the first element in each group. Groupwise study of the p - block elements Group -13 Preparation, properties, and uses of boron and aluminum; Structure, properties, and uses of borax, boric acid, diborane, boron trifluoride, aluminum chloride, and alums. Group -14 The tendency for catenation; Structure, properties, and uses of Allotropes and oxides of carbon, silicon tetrachloride, silicates, zeolites, and silicones. Group -15 Properties and uses of nitrogen and phosphorus; Allotrophic forms of phosphorus; Preparation, properties, structure, and uses of ammonia, nitric acid, phosphine, and phosphorus halides, (PCl3. PCl5); Structures of oxides and oxoacids of nitrogen and phosphorus. Group -16 Preparation, properties, structures, and uses of ozone: Allotropic forms of sulphur; Preparation, properties, structures, and uses of sulphuric acid (including its industrial preparation); Structures of oxoacids of sulphur. Group-17 Preparation, properties, and uses of hydrochloric acid; Trends in the acidic nature of hydrogen halides; Structures of

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	Interhalogen compounds and oxides and oxoacids of halogens. Group-18 Occurrence and uses of noble gases; Structures of fluorides and oxides of xenon.
UNIT 16: d - and f-BLOCK ELEMENTS	Transition Elements General introduction, electronic configuration, occurrence and characteristics, general trends in properties of the first-row transition elements - physical properties, ionization enthalpy, oxidation states, atomic radii, colour, catalytic behaviour, magnetic properties, complex formation, interstitial compounds, alloy formation; Preparation, properties, and uses of $K_2Cr_2O_7$, and $KMnO_4$. Inner Transition Elements Lanthanoids - Electronic configuration, oxidation states, and lanthanoid contraction. Actinoids - Electronic configuration and oxidation states.
UNIT 17: CO-ORDINATION COMPOUNDS	Introduction to coordination compounds. Werner's theory; ligands, coordination number, denticity. chelation; IUPAC nomenclature of mononuclear co-ordination compounds, isomerism; Bonding-Valence bond approach and basic ideas of Crystal field theory, colour and magnetic properties; Importance of co-ordination compounds (in qualitative analysis, extraction of metals and in biological systems).
UNIT 18: ENVIRONMENTAL CHEMISTRY	Environmental pollution - Atmospheric, water, and soil. Atmospheric pollution - Tropospheric and Stratospheric Tropospheric pollutants - Gaseous pollutants: Oxides of carbon, nitrogen, and sulphur, hydrocarbons; their sources, harmful effects, and prevention; Greenhouse effect and Global warming: Acid rain; Particulate pollutants: Smoke, dust, smog, fumes, mist; their sources, harmful effects, and prevention. Stratospheric pollution- Formation and breakdown of ozone, depletion of the ozone layer - its mechanism and effects. Water Pollution - Major pollutants such as. pathogens, organic wastes, and chemical pollutants; their harmful effects and prevention. Soil pollution - Major pollutants such as; Pesticides (insecticides. herbicides and fungicides), their harmful effects, and prevention. Strategies to control environmental pollution.

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ORGANIC CHEMISTRY	
UNIT 19: PURIFICATION AND CHARACTERISATION OF ORGANIC COMPOUNDS	Purification - Crystallization, sublimation, distillation, differential extraction, and chromatography - principles and their applications. Qualitative analysis - Detection of nitrogen, sulphur, phosphorus, and halogens. Quantitative analysis (basic principles only) - Estimation of carbon, hydrogen, nitrogen, halogens, sulphur, phosphorus. Calculations of empirical formulae and molecular formulae: Numerical problems in organic quantitative analysis,
UNIT 20:SOME BASIC PRINCIPLES OF ORGANIC CHEMISTRY	Tetravalency of carbon: Shapes of simple molecules - hybridization (s and p): Classification of organic compounds based on functional groups: and those containing halogens, oxygen, nitrogen, and sulphur; Homologous series: Isomerism - structural and stereoisomerism. Nomenclature (Trivial and IUPAC) Covalent bond fission - Homolytic and heterolytic: free radicals, carbocations, and carbanions; stability of carbocations and free radicals, electrophiles, and nucleophiles. Electronic displacement in a covalent bond - Inductive effect, electromeric effect, resonance, and hyperconjugation. Common types of organic reactions- Substitution, addition, elimination, and rearrangement.
UNITS 21: HYDROCARBONS	Classification, isomerism, IUPAC nomenclature, general methods of preparation, properties, and reactions. Alkanes - Conformations: Sawhorse and Newman projections (of ethane): Mechanism of halogenation of alkanes. Alkenes - Geometrical isomerism: Mechanism of electrophilic addition: addition of hydrogen, halogens, water, hydrogen halides (Markownikoffs and peroxide effect): Ozonolysis and polymerization. Alkynes - Acidic character: Addition of hydrogen, halogens, water, and hydrogen halides: Polymerization. Aromatic hydrocarbons - Nomenclature, benzene - structure and aromaticity: Mechanism of electrophilic substitution: halogenation, nitration. Friedel - Craft's alkylation and acylation, directive influence of the functional group in monosubstituted benzene.

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UNIT 22: ORGANIC COMPOUNDS CONTAINING HALOGENS	General methods of preparation, properties, and reactions; Nature of C-X bond; Mechanisms of substitution reactions. Uses; Environmental effects of chloroform, iodoform freons, and DDT.
UNIT 23: ORGANIC COMPOUNDS CONTAINING OXYGEN	General methods of preparation, properties, reactions, and uses. ALCOHOLS, PHENOLS, AND ETHERS Alcohols: Identification of primary, secondary, and tertiary alcohols: mechanism of dehydration. Phenols: Acidic nature, electrophilic substitution reactions: halogenation. nitration and sulphonation. Reimer - Tiemann reaction. Ethers: Structure. Aldehyde and Ketones: Nature of carbonyl group; Nucleophilic addition to >C=O group, relative reactivities of aldehydes and ketones; Important reactions such as - Nucleophilic addition reactions (addition of HCN. NH3, and its derivatives), Grignard reagent; oxidation: reduction (Wolf Kishner and Clemmensen); the acidity of -hydrogen. aldol condensation, Cannizzaro reaction. Haloform reaction, Chemical tests to distinguish between aldehydes and Ketones. Carboxylic Acids Acidic strength and factors affecting it,
UNIT 24: ORGANIC COMPOUNDS CONTAINING NITROGEN	General methods of preparation. Properties, reactions, and uses. Amines: Nomenclature, classification structure, basic character, and identification of primary, secondary, and tertiary amines and their basic character. Diazonium Salts: Importance in synthetic organic chemistry.
UNIT 25: POLYMERS	General introduction and classification of polymers, general methods of polymerization, - Addition and condensation, copolymerization. Natural and synthetic, rubber and vulcanization, some important polymers with emphasis on their monomers and uses – polythene, nylon, polyester, and bakelite.
UNIT 26: BIOMOLECULES	General introduction and importance of biomolecules. CARBOHYDRATES - Classification; aldoses and ketoses: monosaccharides (glucose and fructose) and constituent

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	monosaccharides of oligosaccharides (sucrose, lactose, and maltose).PROTEINS - Elementary Idea of -amino acids, peptide bond, polypeptides. Proteins: primary, secondary, tertiary, and quaternary structure (qualitative idea only), denaturation of proteins, enzymes. VITAMINS – Classification and functions. NUCLEIC ACIDS – Chemical constitution of DNA and RNA. Biological functions of nucleic acids.
UNIT 27: CHEMISTRY IN EVERYDAY LIFE	Chemicals in Medicines - Analgesics, tranquilizers, antiseptics, disinfectants, antimicrobials, anti-fertility drugs, antibiotics, antacids. Anti-histamines -their meaning and common examples. Chemicals in food - Preservatives, artificial sweetening agents - common examples. Cleansing Agents - Soaps and detergents, cleansing action
UNIT 28: PRINCIPLES RELATED TO PRACTICAL CHEMISTRY	Detection of extra elements (Nitrogen, Sulphur, halogens) in organic compounds; Detection of the following functional groups; hydroxyl (alcoholic and phenolic), carbonyl (aldehyde and ketones) carboxyl, and amino groups in organic compounds. The chemistry involved in the preparation of the following: Inorganic compounds; Mohr's salt, potash alum. Organic compounds: Acetanilide, p-nitro acetanilide, aniline yellow, iodoform. The chemistry involved in the titrimetric exercises – Acids, bases and the use of indicators, oxalic-acid vs KMnO4, Mohr's salt vs KMnO4 Chemical principles involved in the qualitative salt analysis: Cations and Anions Chemical principles involved in the following experiments: 1. Enthalpy of solution of CuSO4 2. Enthalpy of neutralization of strong acid and strong base. 3. Preparation of lyophilic and lyophobic sols. 4. Kinetic study of the reaction of iodide ions with hydrogen peroxide at room temperature.

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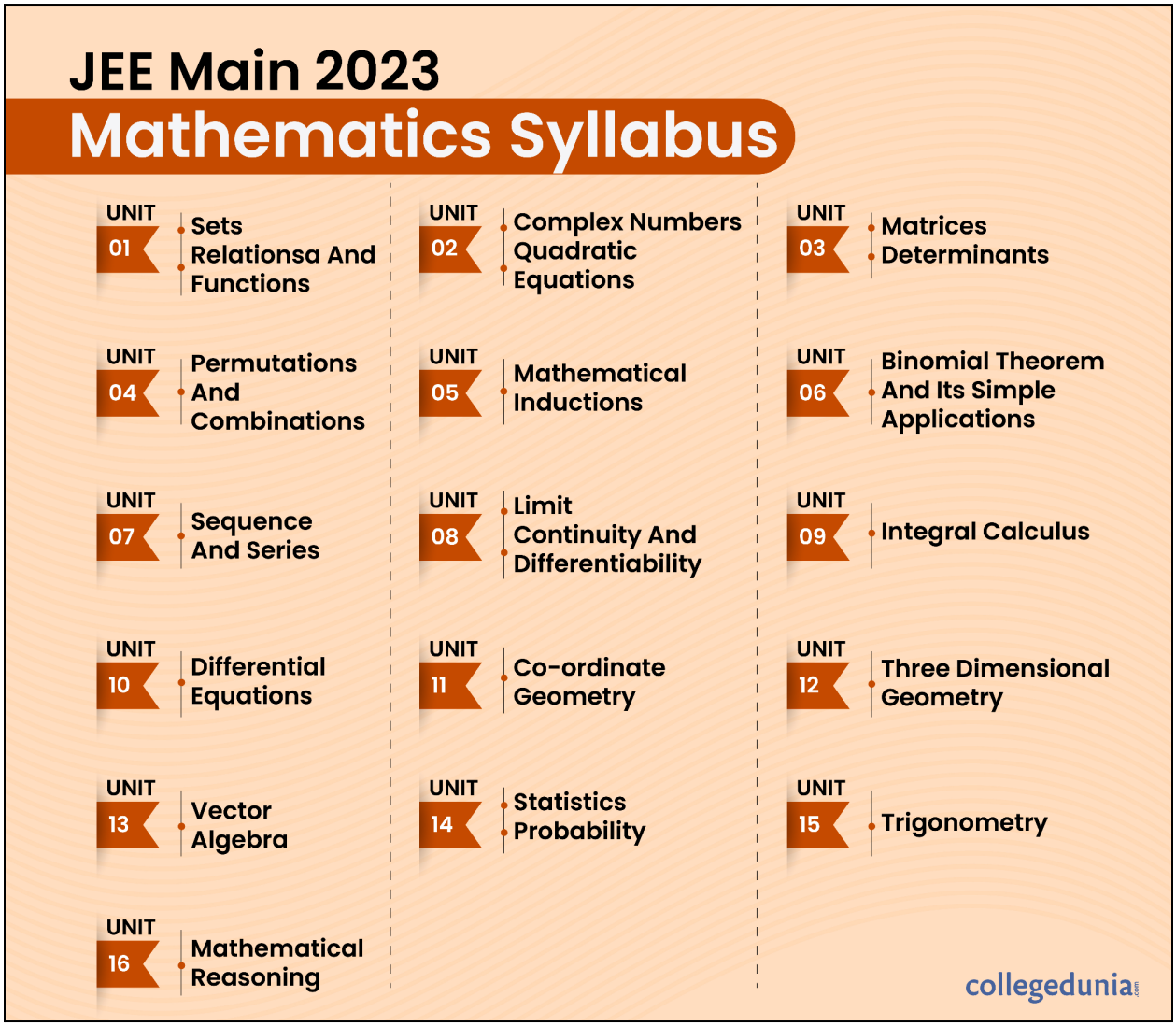
Also Check:

How to Ace JEE Main Chemistry?	JEE Main Chemistry Pattern- What's New?

JEE Main Syllabus of Mathematics

- **JEE MainMathematics Syllabus** includes 16 major topics/units.
- Candidates must note that JEE Mathematics syllabus is the same for B.E/ B. Tech, B. Arch and B. Planning papers.
- Students appearing for JEE Main often report the Mathematics section as the toughest and most time-consuming with lengthy calculations.



Topics	Sub-Topics
UNIT 1: SETS, RELATIONS, AND FUNCTIONS	Sets and their representation: Union, intersection and complement of sets and their algebraic properties; Power set; Relation, Type of relations, equivalence relations, functions; one-one, into and onto functions, the composition of functions.

UNIT 2: COMPLEX NUMBERS AND QUADRATIC EQUATIONS	Complex numbers as ordered pairs of reals, Representation of complex numbers in the form a + ib and their representation in a plane, Argand diagram, algebra of complex number, modulus and argument (or amplitude) of a complex number, square root of a complex number, triangle inequality, Quadratic equations in real and complex number system and their solutions Relations between roots and co-efficient, nature of roots, the formation of quadratic equations with given roots.
UNIT3: MATRICES AND DETERMINANTS	Matrices, algebra of matrices, type of matrices, determinants, and matrices of order two and three, properties of determinants, evaluation of determinants, area of triangles using determinants, Adjoint, and evaluation of inverse of a square matrix using determinants and elementary transformations, Test of consistency and solution of simultaneous linear equations in two or three variables using determinants and matrices.
UNIT 4: PERMUTATIONS AND COMBINATIONS	The fundamental principle of counting, permutation as an arrangement and combination as section, Meaning of P (n,r) and C (n,r), simple applications.
UNIT 5: MATHEMATICAL INDUCTIONS	Principle of Mathematical Induction and its simple applications.
UNIT 6: BINOMIAL THEOREM AND ITS SIMPLE APPLICATIONS	Binomial theorem for a positive integral index, general term and middle term, properties of Binomial coefficients, and simple applications.
UNIT 7: SEQUENCE AND SERIES	Arithmetic and Geometric progressions, insertion of arithmetic, geometric means between two given numbers, Relation between A.M and G.M sum up to n terms of special series; Sn, Sn2, Sn3. Arithmetico-Geometric progression.
UNIT 8: LIMIT, CONTINUITY, AND DIFFERENTIABILITY	Real–valued functions, algebra of functions, polynomials, rational, trigonometric, logarithmic, and exponential functions, inverse function. Graphs of simple functions. Limits, continuity, and differentiability. Differentiation of the sum, difference, product, and quotient of two functions. Differentiation of trigonometric, inverse trigonometric, logarithmic, exponential, composite and implicit functions; derivatives of order up to two, Rolle's and Lagrange's Mean

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	value Theorems, Applications of derivatives: Rate of change of quantities, monotonic increasing and decreasing functions, Maxima and minima of functions of one variable, tangents and normal.
UNIT 9: INTEGRAL CALCULUS	Integral as an anti-derivative, Fundamental Integrals involving algebraic, trigonometric, exponential, and logarithms functions. Integrations by substitution, by parts, and by partial functions. Integration using trigonometric identities. Integral as limit of a sum. The fundamental theorem of calculus, properties of definite integrals. Evaluation of definite integrals, determining areas of the regions bounded by simple curves in standard form.
UNIT 10: DIFFERENTIAL EQUATIONS	Ordinary differential equations, their order, and degree, the formation of differential equations, solution of differential equation by the method of separation of variables, solution of a homogeneous and linear differential equation of the type
UNIT 11: CO-ORDINATE GEOMETRY	Cartesian system of rectangular coordinates in a plane, distance formula, sections formula, locus, and its equation, translation of axes, the slope of a line, parallel and perpendicular lines, intercepts of a line on the co-ordinate axis. Straight line Various forms of equations of a line, intersection of lines, angles between two lines, conditions for concurrence of three lines, the distance of a point form a line, equations of internal and external by sectors of angles between two lines co-ordinate of the centroid, orthocentre, and circumcentre of a triangle, equation of the family of lines passing through the point of intersection of two lines. Circle, conic sections A standard form of equations of a circle, the general form of the equation of a circle, its radius and central, equation of a circle when the endpoints of a diameter are given, points of intersection of a line and a circle with the centre at the origin and condition for a line to be tangent to a circle, equation of the tangent, sections of conics, equations of conic sections (parabola, ellipse, and hyperbola) in standard forms, condition for Y = mx +c to be a tangent and point (s) of tangency.

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UNIT 12: THREE DIMENSIONAL GEOMETRY	Coordinates of a point in space, the distance between two points, section formula, directions ratios, and direction cosines, the angle between two intersecting lines. Skew lines, the shortest distance between them, and its equation. Equations of a line and a plane in different forms, the intersection of a line and a plane, coplanar lines.
UNIT 13: VECTOR ALGEBRA	Vectors and scalars, the addition of vectors, components of a vector in two dimensions and three-dimensional space, scalar and vector products, scalar and vector triple product.
UNIT 14: STATISTICS AND PROBABILITY	Measures of discretion; calculation of mean, median, mode of grouped and ungrouped data calculation of standard deviation, variance and mean deviation for grouped and ungrouped data. Probability: Probability of an event, addition and multiplication theorems of probability, Baye's theorem, probability distribution of a random variate, Bernoulli trials, and binomial distribution.
UNIT 15: TRIGONOMETRY	Trigonometrical identities and equations, trigonometrical functions, inverse trigonometrical functions, and their properties, heights, and distance.
UNIT 16: MATHEMATICAL REASONING	Statement logical operations and, or, implies, implied by, if and only if, understanding of tautology, contradiction, converse, and contrapositive.

Also Check:

How to Ace JEE Main Mathematics?	JEE Main Mathematics Pattern- What's New?

JEE Main Syllabus for Paper 2 (B.Arch & B.Planning)

Mathematics Syllabus for JEE Main B.Arch and B.Planning is the same as JEE Main B.E./B. Tech. Also the Aptitude Syllabus in both JEE Main B.Arch and B.Planning is also the same. Candidates preparing for JEE Main Paper 2 can check the detailed syllabus in the section below-

JEE Main Syllabus for B.Arch

- **JEE Main B.Arch Question Paper** includes three parts-
  - Part I (Mathematics) with 20 MCQs and 10 numerical value type questions,
  - Part II (Aptitude) with 50 MCQs, and
  - Part III (Drawing Test) with 2 questions to test drawing aptitude.
- Mathematics and Aptitude Test is held as a computer-based test while Drawing Test is held offline in pen and paper mode. **Check JEE Main B.Arch Paper Pattern**

JEE Main B.Arch Syllabus- Aptitude

Units	Topics & Sub-Topics
UNIT 1	Awareness of persons. Buildings, Materials. Objects, Texture related to Architecture and Build-environmentVisusalising three-dimensional objects from two-dimensional drawings. Visualizing. Different sides of three-dimensional objects. Analytical Reasoning Mental Ability (Visual. Numerical and Verbal)
UNIT 2	Three dimensional- perception: Understanding and appreciation of scale and proportions of objects, building forms and elements, colour texture harmony and contrast Design and drawing of geometrical or abstract shapes and patterns in pencil. Transformation of forms both 2D and 3D union, subtraction rotation, development of surfaces and volumes, Generation of plans, elevations, and 3D views of objects, Creating two-dimensional and three-dimensional compositions using given shapes and forms.

JEE Main B.Arch Syllabus- Mathematics

Topics	Sub-Topics
UNIT 1: SETS, RELATIONS, AND FUNCTIONS	Sets and their representation: Union, intersection and complement of sets and their algebraic properties; Power set; Relation, Type of relations, equivalence relations, functions; one-one, into and onto functions, the composition of functions.
UNIT 2: COMPLEX NUMBERS AND	Complex numbers as ordered pairs of reals, Representation of complex numbers in the form a + ib and their

QUADRATIC EQUATIONS	representation in a plane, Argand diagram, algebra of complex number, modulus and argument (or amplitude) of a complex number, square root of a complex number, triangle inequality, Quadratic equations in real and complex number system and their solutions Relations between roots and co-efficient, nature of roots, the formation of quadratic equations with given roots.
UNIT3: MATRICES AND DETERMINANTS	Matrices, algebra of matrices, type of matrices, determinants, and matrices of order two and three, properties of determinants, evaluation of determinants, area of triangles using determinants, Adjoint, and evaluation of inverse of a square matrix using determinants and elementary transformations, Test of consistency and solution of simultaneous linear equations in two or three variables using determinants and matrices.
UNIT 4: PERMUTATIONS AND COMBINATIONS	The fundamental principle of counting, permutation as an arrangement and combination as section, Meaning of P (n,r) and C (n,r), simple applications.
UNIT 5: MATHEMATICAL INDUCTIONS	Principle of Mathematical Induction and its simple applications.
UNIT 6: BINOMIAL THEOREM AND ITS SIMPLE APPLICATIONS	Binomial theorem for a positive integral index, general term and middle term, properties of Binomial coefficients, and simple applications.
UNIT 7: SEQUENCE AND SERIES	Arithmetic and Geometric progressions, insertion of arithmetic, geometric means between two given numbers, Relation between A.M and G.M sum up to n terms of special series; Sn, Sn2, Sn3. Arithmetico-Geometric progression.
UNIT 8: LIMIT, CONTINUITY, AND DIFFERENTIABILITY	Real–valued functions, algebra of functions, polynomials, rational, trigonometric, logarithmic, and exponential functions, inverse function. Graphs of simple functions. Limits, continuity, and differentiability. Differentiation of the sum, difference, product, and quotient of two functions. Differentiation of trigonometric, inverse trigonometric, logarithmic, exponential, composite and implicit functions; derivatives of order up to two, Rolle's and Lagrange's Mean value Theorems, Applications of derivatives: Rate of change of quantities, monotonic increasing and decreasing functions,

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	Maxima and minima of functions of one variable, tangents and normal.
UNIT 9: INTEGRAL CALCULUS	Integral as an anti-derivative, Fundamental Integrals involving algebraic, trigonometric, exponential, and logarithms functions. Integrations by substitution, by parts, and by partial functions. Integration using trigonometric identities. Integral as limit of a sum. The fundamental theorem of calculus, properties of definite integrals. Evaluation of definite integrals, determining areas of the regions bounded by simple curves in standard form.
UNIT 10: DIFFERENTIAL EQUATIONS	Ordinary differential equations, their order, and degree, the formation of differential equations, solution of differential equation by the method of separation of variables, solution of a homogeneous and linear differential equation of the type
UNIT 11: CO-ORDINATE GEOMETRY	Cartesian system of rectangular coordinates in a plane, distance formula, sections formula, locus, and its equation, translation of axes, the slope of a line, parallel and perpendicular lines, intercepts of a line on the co-ordinate axis. Straight line Various forms of equations of a line, intersection of lines, angles between two lines, conditions for concurrence of three lines, the distance of a point form a line, equations of internal and external by sectors of angles between two lines co-ordinate of the centroid, orthocentre, and circumcentre of a triangle, equation of the family of lines passing through the point of intersection of two lines. Circle, conic sections A standard form of equations of a circle, the general form of the equation of a circle, its radius and central, equation of a circle when the endpoints of a diameter are given, points of intersection of a line and a circle with the centre at the origin and condition for a line to be tangent to a circle, equation of the tangent, sections of conics, equations of conic sections (parabola, ellipse, and hyperbola) in standard forms, condition for Y = mx +c to be a tangent and point (s) of tangency.
UNIT 12: THREE DIMENSIONAL GEOMETRY	Coordinates of a point in space, the distance between two points, section formula, directions ratios, and direction cosines, the angle between two intersecting lines. Skew

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	lines, the shortest distance between them, and its equation. Equations of a line and a plane in different forms, the intersection of a line and a plane, coplanar lines.
UNIT 13: VECTOR ALGEBRA	Vectors and scalars, the addition of vectors, components of a vector in two dimensions and three-dimensional space, scalar and vector products, scalar and vector triple product.
UNIT 14: STATISTICS AND PROBABILITY	Measures of discretion; calculation of mean, median, mode of grouped and ungrouped data calculation of standard deviation, variance and mean deviation for grouped and ungrouped data. Probability: Probability of an event, addition and multiplication theorems of probability, Baye's theorem, probability distribution of a random variate, Bernoulli trials, and binomial distribution.
UNIT 15: TRIGONOMETRY	Trigonometrical identities and equations, trigonometrical functions, inverse trigonometrical functions, and their properties, heights, and distance.
UNIT 16: MATHEMATICAL REASONING	Statement logical operations and, or, implies, implied by, if and only if, understanding of tautology, contradiction, converse, and contrapositive.

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JEE Main B.Arch Syllabus- Drawing

Sketching of scenes and activities from memory of urbanscape (public space, market, festivals, street scenes, monuments, recreational spaces, etc). landscape (riverfronts. Jungle. Gardens, trees. Plants, etc.) and rural life. To be conducted in a Drawing sheet. **Note:** Candidates are advised to bring pencils. Own geometry box set, crasets and colour pencils, and crayons for the Drawing Test.

JEE Main Syllabus for B.Planning

- JEE Main B.Planning Syllabus is divided into three parts/sections-
  - Part I (Mathematics) with 20 MCQs and 10 numerical value type questions
  - Part II (Aptitude) with 50 MCQs and

- Part III (Planning) with 25 MCQs. Check JEE Main B.Planning Exam Pattern

JEE Main B.Planning Syllabus- Aptitude

Units	Topics & Sub-Topics
UNIT 1	Awareness of persons. Buildings, Materials. Objects, Texture related to Architecture and Build-envirounmentVisusalising three-dimensional objects from two-dimensional drawings. Visualizing. Different sides of three-dimensional objects. Analytical Reasoning Mental Ability (Visual. Numerical and Verbal)
UNIT 2	Three dimensional- perception: Understanding and appreciation of scale and proportions of objects, building forms and elements, colour texture harmony and contrast Design and drawing of geometrical or abstract shapes and patterns in pencil. Transformation of forms both 2D and 3D union, subtraction rotation, development of surfaces and volumes, Generation of plans, elevations, and 3D views of objects, Creating two-dimensional and three-dimensional compositions using given shapes and forms.

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JEE Main B.Planning Syllabus- Planning

Topics	Sub-Topics
UNIT-1 GENERAL AWARENESS	General knowledge questions and knowledge about prominent cities, development issues, government programs, etc.
UNIT-2 SOCIAL SCIENCES	The idea of nationalism, nationalism in India, pre-modern world, 19th-century global economy, colonialism, and colonial cities, industrialization, resources, and development, types of resources, agriculture, water, mineral resources, industries, national economy; Human Settlements Power-sharing, federalism, political parties, democracy, the constitution of India Economic development- economic sectors, globalization, the concept of development, poverty; Population structure, social exclusion, and inequality, urbanization, rural development, colonial cities,

UNIT-3 THINKING SKILLS	Comprehension (unseen passage); map reading skills, scale, distance, direction, area, etc.; critical reasoning; understanding of charts, graphs, and tables; basic concepts of statistics and quantitative reasoning.

JEE Main B.Planning Syllabus- Mathematics

Topics	Sub-Topics
UNIT 1: SETS, RELATIONS, AND FUNCTIONS	Sets and their representation: Union, intersection and complement of sets and their algebraic properties; Power set; Relation, Type of relations, equivalence relations, functions; one-one, into and onto functions, the composition of functions.
UNIT 2: COMPLEX NUMBERS AND QUADRATIC EQUATIONS	Complex numbers as ordered pairs of reals, Representation of complex numbers in the form a + ib and their representation in a plane, Argand diagram, algebra of complex number, modulus and argument (or amplitude) of a complex number, square root of a complex number, triangle inequality, Quadratic equations in real and complex number system and their solutions Relations between roots and co-efficient, nature of roots, the formation of quadratic equations with given roots.
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UNIT 6: BINOMIAL THEOREM AND ITS	Binomial theorem for a positive integral index, general term and middle term, properties of Binomial coefficients, and simple applications.

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SIMPLE APPLICATIONS	
UNIT 7: SEQUENCE AND SERIES	Arithmetic and Geometric progressions, insertion of arithmetic, geometric means between two given numbers, Relation between A.M and G.M sum up to n terms of special series; Sn, Sn2, Sn3. Arithmetico-Geometric progression.
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	and external by sectors of angles between two lines co-ordinate of the centroid, orthocentre, and circumcentre of a triangle, equation of the family of lines passing through the point of intersection of two lines. Circle, conic sections A standard form of equations of a circle, the general form of the equation of a circle, its radius and central, equation of a circle when the endpoints of a diameter are given, points of intersection of a line and a circle with the centre at the origin and condition for a line to be tangent to a circle, equation of the tangent, sections of conics, equations of conic sections (parabola, ellipse, and hyperbola) in standard forms, condition for Y = mx +c to be a tangent and point (s) of tangency.
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UNIT 13: VECTOR ALGEBRA	Vectors and scalars, the addition of vectors, components of a vector in two dimensions and three-dimensional space, scalar and vector products, scalar and vector triple product.
UNIT 14: STATISTICS AND PROBABILITY	Measures of discretion; calculation of mean, median, mode of grouped and ungrouped data calculation of standard deviation, variance and mean deviation for grouped and ungrouped data. Probability: Probability of an event, addition and multiplication theorems of probability, Baye's theorem, probability distribution of a random variate, Bernoulli trials, and binomial distribution.
UNIT 15: TRIGONOMETRY	Trigonometrical identities and equations, trigonometrical functions, inverse trigonometrical functions, and their properties, heights, and distance.
UNIT 16: MATHEMATICAL REASONING	Statement logical operations and, or, implies, implied by, if and only if, understanding of tautology, contradiction, converse, and contrapositive.

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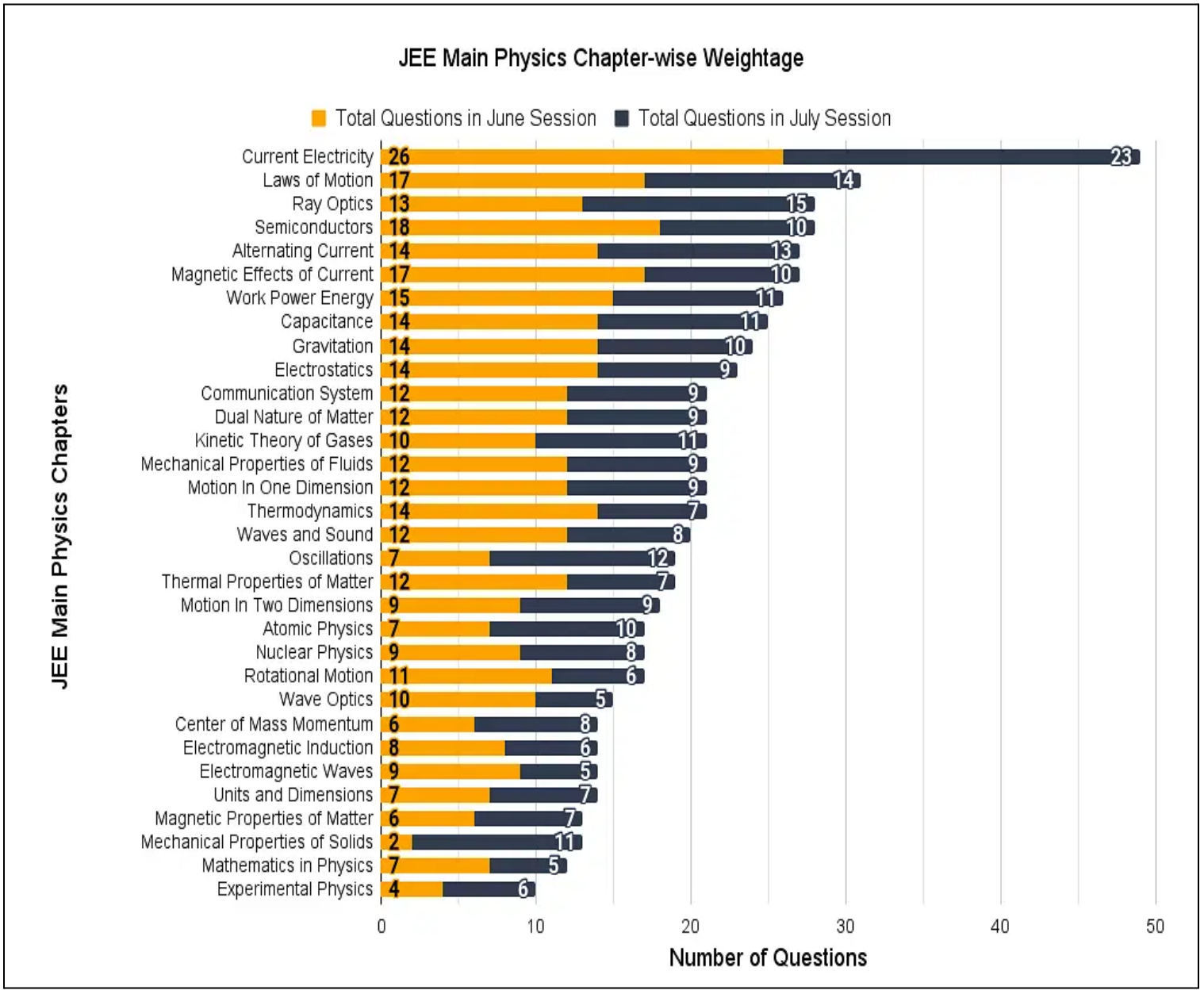
JEE Main Chapter-wise Weightage

Knowing the important topics and sub-topics and JEE Main Chapter-wise Weightage is of the utmost importance when it comes to **JEE Main Preparations**. Esch chapter in JEE Main Syllabus is assigned a certain weightage of marks. Although this weightage is not fixed, a previous year analysis helps candidates to know the topics with the highest weightage in the exam. The section below covers subject-wise **JEE Main Chapter-wise Weightage** based on 2022, 2021, 2020 and 2019 exam.

JEE Main Physics Chapter-wise Weightage



Chapters	JEE Physics Questions	
	June Session (2022)	July Session (2022)
Current Electricity	26	23
Laws of Motion	17	14
Ray Optics	13	15
Semiconductors	18	10
Alternating Current	14	13
Magnetic Effects of Current	17	10
Work Power Energy	15	11
Capacitance	14	11
Gravitation	14	10
Electrostatics	14	9
Communication System	12	9
Dual Nature of Matter	12	9
Kinetic Theory of Gases	10	11
Mechanical Properties of Fluids	12	9
Motion In One Dimension	12	9
Thermodynamics	14	7
Waves and Sound	12	8
Oscillations	7	12
Thermal Properties of Matter	12	7
Motion In Two Dimensions	9	9
Atomic Physics	7	10
Nuclear Physics	9	8

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Rotational Motion	11	6
Wave Optics	10	5
Center of Mass Momentum	6	8
Electromagnetic Induction	8	6
Electromagnetic Waves	9	5
Units and Dimensions	7	7
Magnetic Properties of Matter	6	7
Mechanical Properties of Solids	2	11
Mathematics in Physics	7	5
Experimental Physics	4	6

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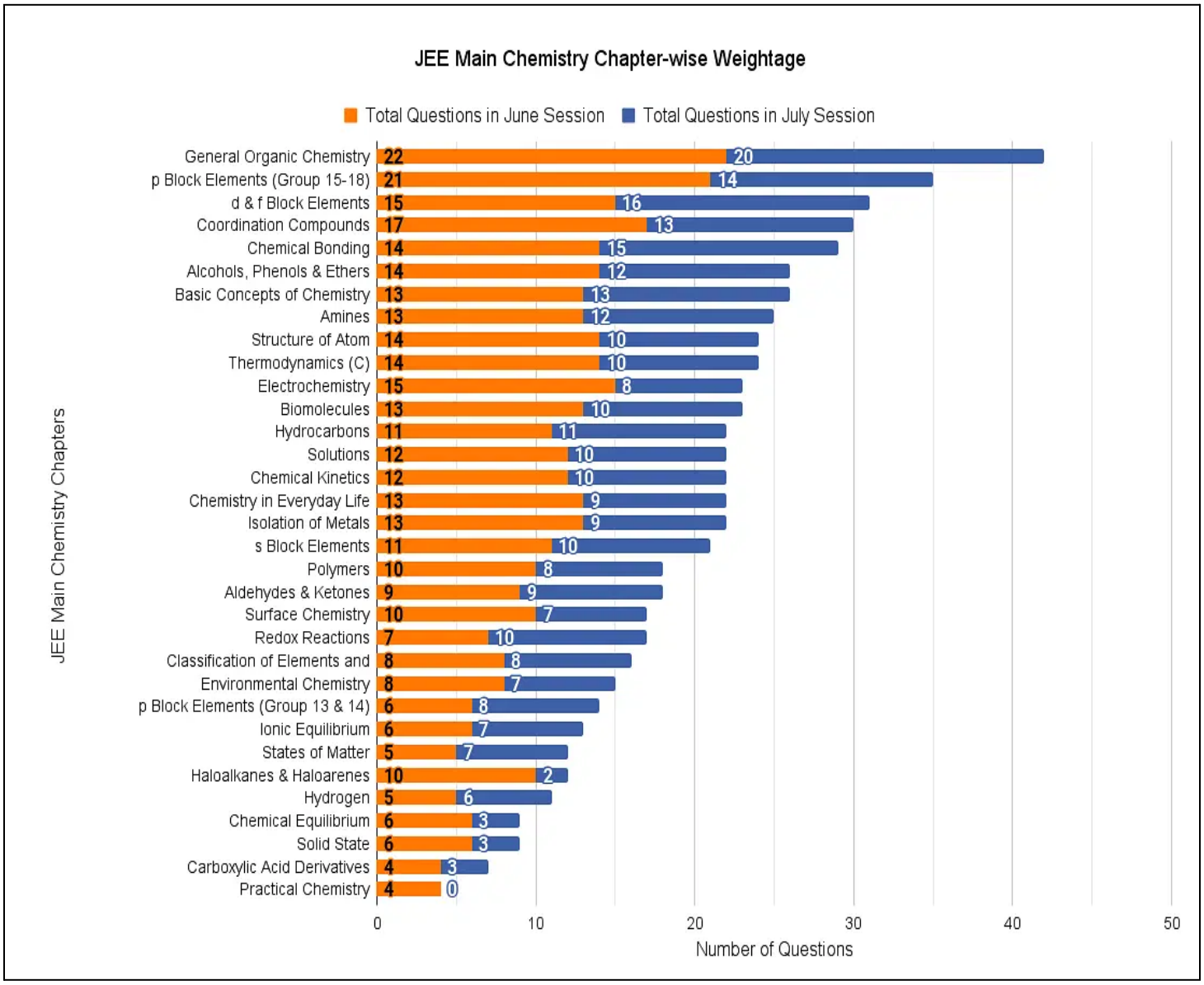
JEE Main Chemistry Chapter-wise Weightage



Chapters	JEE Chemistry Questions	
	June Session (2022)	July Session (2022)
Alcohols, Phenols & Ethers	14	12
Aldehydes & Ketones	9	9
Amines	13	12
Basic Concepts of Chemistry	13	13
Biomolecules	13	10

Carboxylic Acid Derivatives	4	3
Chemical Bonding	14	15
Chemical Equilibrium	6	3
Chemical Kinetics	12	10
Chemistry in Everyday Life	13	9
Classification of Elements and Periodicity	8	8
Coordination Compounds	17	13
d & f Block Elements	15	16
Electrochemistry	15	8
Environmental Chemistry	8	7
General Organic Chemistry	22	20
Haloalkanes & Haloarenes	10	2
Hydrocarbons	11	11
Hydrogen	5	6
Ionic Equilibrium	6	7
Isolation of Metals	13	9
p Block Elements (Group 13 & 14)	6	8
p Block Elements (Group 15-18)	21	14
Polymers	10	8
Practical Chemistry	4	0
Redox Reactions	7	10
s Block Elements	11	10
Solid State	6	3

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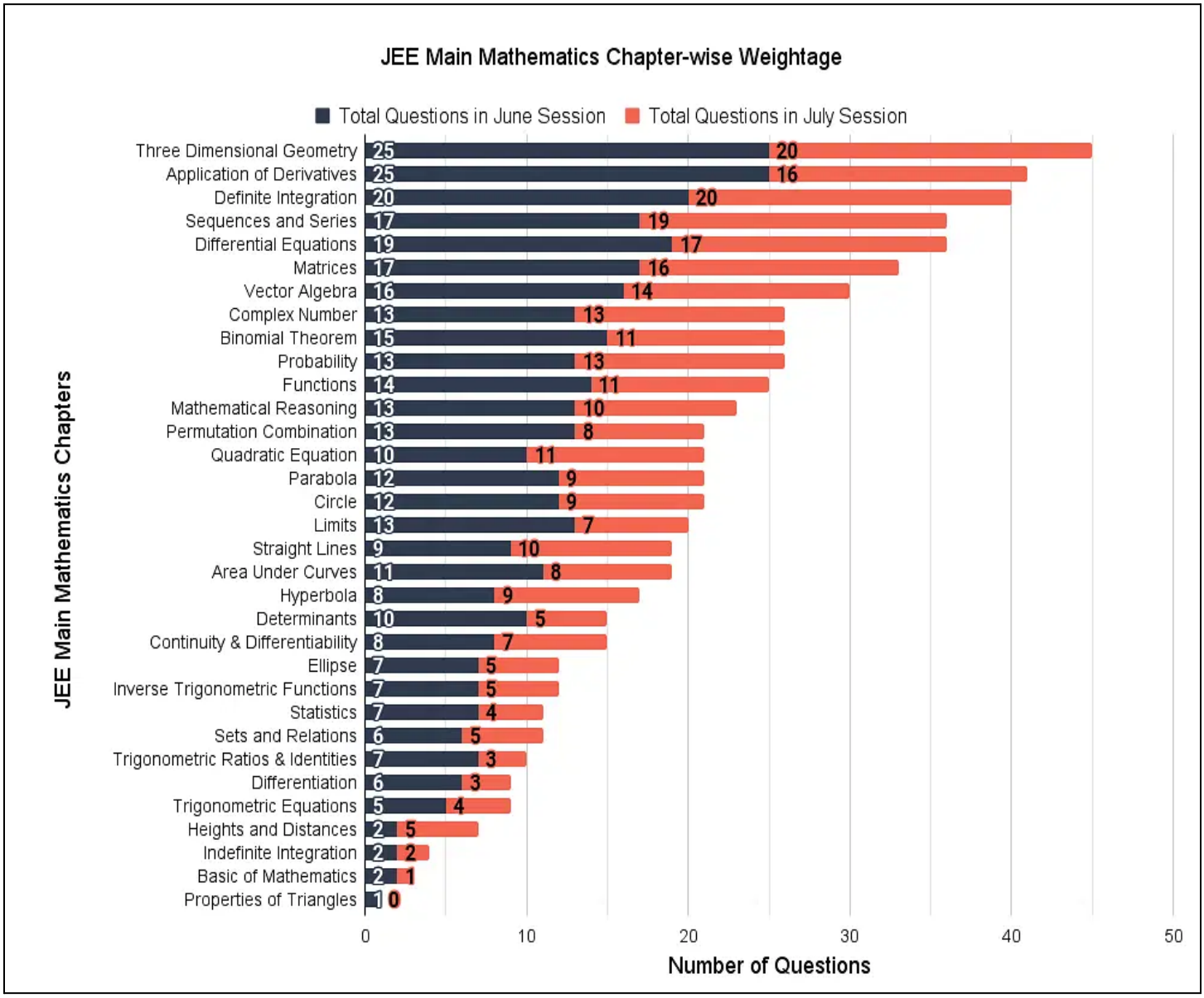
Solutions	12	10
States of Matter	5	7
Structure of Atom	14	10
Surface Chemistry	10	7
Thermodynamics (C)	14	10

JEE Main Mathematics Chapter-wise Weightage



Chapters	JEE Mathematics Questions

	June Session (2022)	July Session (2022)
Application of Derivatives	25	16
Area Under Curves	11	8
Basic of Mathematics	2	1
Binomial Theorem	15	11
Circle	12	9
Complex Number	13	13
Continuity & Differentiability	8	7
Definite Integration	20	20
Determinants	10	5
Differential Equations	19	17
Differentiation	6	3
Ellipse	7	5
Functions	14	11
Heights and Distances	2	5
Hyperbola	8	9
Indefinite Integration	2	2
Inverse Trigonometric Functions	7	5
Limits	13	7
Mathematical Reasoning	13	10
Matrices	17	16
Parabola	12	9
Permutation Combination	13	8
Probability	13	13

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Properties of Triangles	1	0
Quadratic Equation	10	11
Sequences and Series	17	19
Sets and Relations	6	5
Statistics	7	4
Straight Lines	9	10
Three Dimensional Geometry	25	20
Trigonometric Equations	5	4
Trigonometric Ratios & Identities	7	3
Vector Algebra	16	14

JEE Main Exam Pattern

- No new changes have been made to **JEE Main Exam Pattern** this year. Following the revised pattern last year, candidates get an internal choice in Section B for Physics, Chemistry and Mathematics.
- NTA has, however, revised the marking scheme for JEE Main.
- Unlike the previous year, there is a negative marking for both MCQs and numerical value answer type questions.

Feature	Paper Pattern for B.Tech	Paper Pattern for B.Arch	Paper Pattern for B.Planning
Examination Mode	Computer-based Test	Computer-based Test (Drawing Test in Pen and Paper Mode)	Computer-based Test
Exam Language	13 languages (English, Hindi, Assamese, Bengali, Gujarati, Kannada, Malayalam, Marathi, Odia, Punjabi, Tamil, Telugu, and Urdu)		

Number of Sections	Three- Physics, Chemistry and Mathematics	Three- Mathematics, Aptitude, Drawing	Three- Mathematics, Aptitude, Planning
Exam Duration	3 hours	3 hours	3 hours
Sectional Time Limit	None	None	None
Total Marks	300 marks	400 marks	400 marks
Total Number of Questions Asked	90 questions	82 Questions	105 Questions
Total Number of Questions to be Answered	75 questions	77 Questions	100 Questions
Type of Questions	Multiple Choice Questions (MCQ); Numerical Answer Type Questions	Multiple Choice Questions (MCQ); Numerical Answer Type Questions; Drawing Questions	Multiple Choice Questions (MCQ); Numerical Answer Type Questions
Section-wise Number of Questions	Physics- 20 MCQs and 10 numerical type, Chemistry- 20 MCQs and 10 numerical type, Mathematics- 20 MCQs and 10 numerical type	Mathematics- 20 MCQs and 10 numerical type, Aptitude- 50 questions, Drawing- 2 questions	Mathematics- 20 MCQs and 10 numerical type, Aptitude- 50 questions, Planning- 25 questions
Section-wise Weightage	Physics- 100 marks, Chemistry- 100 marks, Mathematics- 100 marks	Mathematics- 100 marks, Aptitude- 200 marks, Drawing- 100 marks	Mathematics- 100 marks, Aptitude- 200 marks, Planning- 100 marks

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Marking Scheme	+4 for each correct answer	+4 for each correct answer 50 marks for each drawing questions	+4 for each correct answer
Negative Marking	-1 for each incorrect answer	-1 for each incorrect answer	-1 for each incorrect answer

Also Check:

JEE Main B.E./B.Tech Exam Pattern	JEE Main B.Arch Exam Pattern	JEE Main B.Planning Exam Pattern

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JEE Main Previous Year Question Papers

- Candidates preparing for **JEE Main exam** can use the previous year question papers to test their preparation level and also be familiarized with the exam pattern.
- NTA will release **JEE Main 2023 Question Papers** after the conclusion of each phase of the exam separately for B.E./ B.Tech, B.Arch, and B.Planning.
- Candidates can meanwhile download **JEE Main Previous Year Question Papers** using the links mentioned below-

JEE Main 2022 Phase 1 Question Paper

Paper/ Subject	Exam Date	Shift/ Slot	JEE Main Question Paper
B.E./ B.Tech	June 29	1	Check Here
B.E./ B.Tech	June 29	2	Check Here
B.E./ B.Tech	June 28	1	Check Here
B.E./ B.Tech	June 28	2	Check Here
B.E./ B.Tech	June 27	1	Check Here

B.E./ B.Tech	June 27	2	Check Here
B.E./ B.Tech	June 26	1	Check Here
B.E./ B.Tech	June 26	2	Check Here
B.E./ B.Tech	June 25	1	Check Here
B.E./ B.Tech	June 25	2	Check Here
B.E./ B.Tech	June 24	1	Check Here
B.E./ B.Tech	June 24	2	Check Here

JEE Main 2022 Phase 2 Question Paper

Paper/ Subject	Exam Date	Shift/ Slot	JEE Main Question Paper
B.E./B.Tech	July 25	Shift 1	Check Here
B.E./B.Tech	July 25	Shift 2	Check Here
B.E./B.Tech	July 26	Shift 1	Check Here
B.E./B.Tech	July 26	Shift 2	Check Here
B.E./B.Tech	July 27	Shift 1	Check Here
B.E./B.Tech	July 27	Shift 2	Check Here
B.E./B.Tech	July 28	Shift 1	Check Here
B.E./B.Tech	July 28	Shift 2	Check Here
B.E./B.Tech	July 29	Shift 1	Check Here
B.E./B.Tech	July 29	Shift 2	Check Here
B.Arch/ B.Planning	July 30	Shift 1	Check Here
B.Arch/ B.Planning	July 30	Shift 2	Check Here

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JEE Main Previous Year Question Paper

Year	Question Paper PDF Download
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Three Dimensional geometry	56	19	31
Sequences and Series	38	28	26
Application of Derivatives	36	31	22
Definite Integration	48	15	23
Binomial Theorem	38	19	21
Differential Equations	43	16	15
Determinants	29	21	22
Probability	32	17	19

Vector Algebra	35	13	16
Complex Numbers	30	17	14
Quadratic equations	23	16	20
Circle	29	8	21
Functions	32	11	15
Mathematical Reasoning	25	16	16
Permutation Combination	26	13	14
Matrices	33	10	9
Straight Lines	19	12	20
Statistics	21	15	14
Limits	24	13	12
Continuity and Differentiability	23	9	13
Area under Curves	17	11	14
Parabola	14	11	15
Ellipse	15	11	9
Indefinite Integration	11	8	15
Inverse Trignometric Functions	19	4	8
Hyperbola	10	7	11
Sets and Relations	10	8	8
Trigonometric Equations	11	4	8
Differentiation	5	9	9
Heights and Distances	8	4	7
Trigonometric Ratios and Identities	7	4	7
Properties of Triangle	5	0	5
Basic of Mathematics	4	0	1
Pair of Lines	2	0	0
Mathematical Induction	1	0	0
Linear Programming	1	0	0