MUJEE 2025 Syllabus PDF

Mangalayatan University Joint Entrance Exam (MUJEE)

MUJEE 2025 Syllabus for Physics

Topics	Details
Units and Measurement	Units and Measurement Units for measurement, system of units-S.I.
Electricity and Magnetism Electrostatics	Electricity and Magnetism Electrostatics-Coulomb's inverse square law-dielectric constant-electric field-electric lines of force-electric dipole-electric potential-potential difference-electric flux-Gauss theorem-electrostatic induction-capacitor capacitors in parallel
Gravitation	Gravitation, Mechanics of Solids and Fluids The universal law of gravitation, acceleration due to gravity-variation of 'g' with altitude, latitude and depth-gravitation potential-escape velocity and orbital velocity.

Atomic Physics and Relativity	Atomic Physics and Relativity Atomic structure-properties of cathode rays and positive rays-specific charge of an electron-atom model-Thomson atom model-Rutherford atom model-Bohr atom model- merits
Oscillations and Wave Motion	Oscillations and Wave Motion Periodic motion-simple harmonic motion- equations of motion oscillations of spring-simple pendulum-free, forced and damped oscillations resonance.
Dual Nature of Matter	Dual Nature of Matter and Nuclear Physics Matter waves-wave nature of particles De Broglie wavelength-electron microscope. Nuclear properties; radius, mass, binding energy, density, isotopes
Heat and Thermodynamics	Heat and Thermodynamics Kinetic theory of gases-postulates-pressure of a gas specific heat capacity-relation between Cp and Cv-first law of thermodynamics.
Electronics and Communication	Electronics and Communication Semiconductors-doping-types-PN junction diode-biasing-diode as a Rectifier-transistors-transistor characteristics-amplifier-gain feedback in amplifiers-logic gates- basic logic gates-NOT, OR, AND, NOR
Ray and Wave Optics and Magnetism	Ray and Wave Optics and Magnetism
Mechanics	Mechanics Motion in one dimension and accelerated motion-scalar and vector quantities-Newton's laws of motion-force and projectile motion-uniform circular motion friction-laws of friction

MUJEE 2025 Syllabus for Chemistry

Some Basic Concepts in Chemistry	Some Basic Concepts in Chemistry include Matter and its nature; Dalton's atomic theory, the concept of atom, molecule, element and compound; physical quantities and their measurements in chemistry; and precision.
States of Matter	States of Matter Classification of matter into solid, liquid and gaseous states. Solid State: Classification of solids: molecular, ionic, covalent and metallic solids, amorphous and crystalline solids (elementary idea).
Chemical Families	Chemical Families–Periodic Properties Modern periodic law and present form of the periodic table, s & p block elements, periodic trends in properties of elements, atomic and ionic radii, ionization enthalpy
Atomic Structure	Atomic Structure Discovery of sub-atomic particles (electron, proton and neutron); Thomson and Rutherford atomic models and their limitations; nature of electromagnetic radiation, photoelectric effect.
Chemical Bonding and Molecular Structure	Chemical Bonding and Molecular Structure 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.
Chemical Energetics	Chemical Energetics First law of thermodynamics, Energy changes during a chemical reaction, Internal energy and Enthalpy.
Chemical Thermodynamics	Chemical Thermodynamics Second law of thermodynamics–Spontaneity of processes; S of the universe.

Solutions	Solutions Different methods for expressing concentration of solution-Molality, molarity, mole fraction, percentage (by volume and mass both), vapour pressure of solutions and Raoult's law-ideal and non-ideal solutions, vapour pressure-composition plots for ideal
Chemical Equilibrium	Chemical Equilibrium Meaning of equilibrium, concept of dynamic equilibrium. Equilibria involving physical processes: Solid-liquid, liquid-gas and solid-gas equilibria, Henry's law.
Electrochemistry	Electrochemistry Electrolytic and metallic conduction, conductance in electrolytic solutions, specific and molar conductivities and their variation with concentration: Kohlrausch's law and its applications
Surface Chemistry	Surface Chemistry, Chemical Kinetics and Catalysis Adsorption–Physisorption and chemisorption and their characteristics.
Purification and Characterisation of Organic Compounds	Purification and Characterisation of Organic Compounds Purification– Crystallization, sublimation, distillation, differential extraction and chromatography– principles and their applications
Some Basic Principles of Organic Chemistry	Some Basic Principles of Organic Chemistry Tetravalency of carbon; shapes of simple molecules–hybridization (s and p)
Hydrocarbons	Hydrocarbons Classification, isomerism, IUPAC nomenclature, general methods of preparation, properties and reactions.
Organic Compounds	Organic Compounds Containing Oxygen General preparation methods, properties, reactions and uses. Alcohols: Identification of primary, secondary.
Organic Compounds Containing Nitrogen	Organic Compounds Containing Nitrogen General preparation methods, properties, reactions and uses. Amines: Nomenclature, classification, structure

Polymers	Polymers General introduction and classification of polymers, general methods of polymerization– addition and condensation, copolymerization; natural and synthetic rubber.
Bio Molecules	Bio Molecules Carbohydrates– Classification: aldoses and ketoses; monosaccharides (glucose and fructose), constituent monosaccharides of oligosacchorides (sucrose, lactose, maltose) and polysaccharides (starch, cellulose, glycogen).
Chemistry in Everyday Life	Chemistry in Everyday Life. Antihistamins–their meaning and common examples.

MUJEE 2025 Syllabus for Mathematics

Sets, Relations and Functions	Sets, Relations and Functions Sets and their representations, union, intersection and complements of sets and their algebraic properties
Complex Numbers	Complex numbers in the form a+ib and their representation in a plane. Argand diagram. Algebra of complex numbers, modulus.
Matrices and Determinants	Matrices and Determinants Determinants and matrices of order two and three, properties of determinants.
Applications of Matrices and Determinants	Applications of Matrices and Determinants Computing the rank of a matrix–test of consistency and solution of simultaneous linear equations using determinants and matrices.
Quadratic Equations	Quadratic equations in real and complex number system and their solutions. Relation between roots and coefficients, nature of roots.
Permutations and Combinations	Fundamental principle of counting: permutation as an arrangement and combination as selection, meaning of P(n,r) and C(n,r).

Mathematical Induction and its Applications	Mathematical Induction and its Applications Stating and interpreting the principle of mathematical induction. Using it to prove formula and facts.
Binomial theorem and its Applications	Binomial theorem and its Applications Binomial theorem for a positive integral index; general term and middle term.
Sequences and Series	Sequences and Series
Differential Calculus	Differential Calculus Polynomials, rational, trigonometric, logarithmic and exponential functions. Inverse functions. Graphs of simple functions. Limits, continuity, differentiation of the sum, difference, product and quotient of two functions.
Applications of Differential Calculus	Applications of Differential Calculus Rate of change of quantities, monotonic– increasing and decreasing functions, maxima.
Integral Calculus	Integral Calculus Integral as an anti-derivative. Fundamental integrals involving algebraic, trigonometric, exponential and logarithmic functions. Integration by substitution, by parts and by partial fractions. Integration using trigonometric identities. Integral as limit of a sum.
Differential Equations	Differential Equations Ordinary differential equations, their order and degree. Formation of differential equations.
Straight Lines in Two Dimensions	Straight Lines in Two Dimensions Cartesian system of rectangular co-ordinates in plane, distance formula, area of a triangle.conditions for concurrence of three lines, distance of a point from a line. Equations of internal and external bisectors of angles between two lines, coordinates of centroid, orthocenter.
Measures of Central Tendency and Dispersion	Measures of Central Tendency and Dispersion Calculation of mean, median and mode of grouped and ungrouped data.

Circles in Two Dimensions	Circles in Two Dimensions Standard form of equation of a circle, general form of the equation of a circle, its radius and centre, equation of a circle in the parametric form, equation of a circle when the end points of a diameter are given, points of intersection of a line and a circle with the centre at the origin.
Conic Sections in Two Dimensions	Conic Sections in Two Dimensions Sections of cones, equations of conic sections (parabola, ellipse and hyperbola) in standard form, condition for y = mx+c to be a tangent and point(s) of tangency.
Vector Algebra	Vector Algebra Vectors and scalars, addition of vectors, components of a vector in two dimensions and three dimensional space, scalar and vector products, scalar and vector triple product. Application of vectors to plane geometry.
Probability	Probability of an event, addition and multiplication theorems of probability and their applications; Conditional probability.
Trigonometry	Trigonometrically identities and equations. Inverse trigonometric functions and their properties. Properties of triangles, including, incentre.
Arithmetic, geometric and harmonic progressions	Insertion of arithmetic, geometric and harmonic means between two given numbers.