

PHYSICS LECTURE PLAN (PART A) – JEE

		Part A	Week
	Class-1	Charge and its properties, Methods of charging, Coulomb's Law, Force due to multiple charges	
	Class-2	Problems on Coulomb's Law, SHM problems involving charged particles, Electric field introduction	2 April – 7 April
	Class-3	Motion of charged particle in external electric field, Electric dipole, Torque and potential energy of dipole in external field	
	Class-4	Electric field due to point charge, system of charges, dipole, Field due to straight and circular line charge, Properties of electric field lines	
Chapter-13A:	Class-5	Electric flux, Gauss law, Use of gauss law to find field due to point charge, infinite line charge, infinite sheet, spherical shell, uniform solid sphere	9 April – 14 April
Electrostatics	Class-6	Electric potential introduction, Potential due to point charge, system of charges, dipole, Field-potential relation, Equipotential surface, Potential due to straight & circular line charge, Infinite sheet	
	Class-7	Potential due to Spherical shell and Solid sphere, Electrostatic potential energy, Problems on conservation of energy	
	Class-8	Conductors: Properties under electrostatic condition, Earthing of conductor, Connecting two isolated conducting spheres, Charge distribution on concentric conducting shells and system of parallel plates	16 April – 21 April
	Class-9	Problem solving/doubts from module & workbook	
	Class-1	Current basics, Ohm's law, Drift velocity, Mobility, Limitation of Ohm' Law	23 April – 28 April
	Class-2	Temperature dependence of resistivity & resistance, Combination of Resistors	
Chapter-14A: DC Circuits	Class-3	Electric power consumed by resistor & bulb, EMF, internal resistance & power of cell, Grouping of cells	
De circuits	Class-4	Kirchhoff's current & voltage laws	30 April – 5 May
	Class-5	Wheatstone bridge, Meter bridge, Ammeter, Voltmeter, Galvanometer, Conversion of Galvanometer to Ammeter and Voltmeter	307(pin 3 way
	Class-6	Problem solving/doubts from module & workbook	
	Class-1	Capacitor basics, Energy stored in capacitor, Parallel plate capacitor, Combination of capacitors	7 May – 12 May
Chapter-15A: Capacitors	Class-2	Connection of two capacitors, Dielectrics & polarisation, Capacitor with dielectric	
Capacitors	Class-3	Application of Kirchhoff's laws in capacitors, Charging & discharging of capacitors	14 May – 19 May
	Class-4	Problem solving/doubts from module & workbook	

	Class-1 Class-2 Class-3	Biot-Savart's law, field due to straight wire, field due to circular loop, field due to combined straight and circular wires Ampere's circuital law and its application to find magnetic field due to long straight wire, current carrying solid and hollow cylinder, solenoid Magnetic force on moving charge, Lorentz force, Circular motion of a charged particle in uniform	21 May – 26 May
Chapter-16A: Magnetism	Class-4	magnetic field Helical motion of a charged particle in uniform magnetic field, Magnetic force on current element, straight current-carrying wire, force between two current carrying wires	28 May– 2 June
	Class-5	Current loop as a magnetic dipole, dipole in a uniform magnetic field, Moving coil galvanometer	
	Class-6	Bar magnet, Gauss' law in magnetism, magnetic properties of matter	
	Class-7	Problem Solving/doubts from module & workbook	4 June – 9 June
	Class-1	Magnetic Flux, Faraday's Law, Lenz's Law, Calculation of induced current/charge flow: Varying B, Varying angle, Varying area	rsune ssune
Chapter-17A:	Class-2	Motional EMF, Problems on motional EMF, EMF due to rotation	
Electromagnetic Induction	Class-3	Mutual inductance, Self inductance, Potential drop across an inductor, Energy stored in an Inductor	11 June – 16 June
	Class-4	RL circuit: growth & decay of current with time, Inductor in series and parallel	
	Class-5	LC oscillations, AC Generator	
	Class-1	Basics of AC, Average & rms value, Purely resistive, purely capacitive & purely inductive circuit: phase difference and reactance	18 June-23 June
Chapter-18A: AC Circuits & EM Waves	Class-2	Series combination of RC, RL, and LCR circuits using Phasor Diagrams: impedance, phase factor & power factor	25 June-30 June
	Class-3	Resonance in series LCR Circuit, Transformers	
	Class-4	Displacement current, Ampere Maxwell Law, Induced electric field, Maxwell's equations, Introduction to EM wave and its equation	2 July-7 July
	Class-5	Energy and Intensity of EM waves, Momentum and radiation pressure, EM Waves spectrum: Production, Detection & Application	2 July - / July

	Class-1	Laws of reflection, Image formation by plane mirror, Field of view	9 July-14 July
	Class-2	Image formation by spherical mirror	
	Class-3	Laws of refraction, Refraction by glass slab, Total internal reflection	
	Class-4	Refraction by prism, Minimum & maximum angle of deviation, TIR in prism	16 July-21 July
Chapter-19A: Ray Optics	Class-5	Image formation by refraction at plane surface (apparent depth), glass slab (shift produced), Image formation by refraction at spherical surface	
	Class-6	Lens makers formula, types of Lens, Image formation by Lens, combination of lens	
	Class-7	Simple & compound microscope	23 July-28 July
	Class-8	Astronomical telescope, Problem Solving/doubts from module & workbook	
	Class-1	Wavefront, Huygen's Principle, Laws of reflection and refraction using Huygen's priciple, Introduction to Interference: coherent & incoherent source, phase difference & path difference, resultant amplitude & intensity, constructive & destructive interference	30 July-4 August
Chapter-20A: Wave Optics	Class-2	Young's Double Slit Experiment (YDSE): setup, fringe width, Intensity variation on screen	
Trave optios	Class-3	Thin glass slab covering slit (shift in fringe pattern), no. of maximas and minimas , Young's Double Hole Exp.	
	Class-4	Diffraction due to a single slit, width of central maxima & secondary maxima, Polarisation, Brewster's law	6 August - 11 August
	Class-1	Photoelectric effect: basics, graphs, Einstein's equation	
	Class-2	Problems on photoelectric effect, Radiation pressure, Matter Wave	13 August - 18 August
Chapter-21A:	Class-3	Alpha scattering experiment, Rutherford model, Bohr Model, Atomic Line Spectrum	
Modern Physics	Class-4	Nucleus: radius, density, Mass defect, Nuclear stability, Binding energy, Nuclear forces, Nuclear reactions: conservation of nucleons, mass defect, Q-value	20 August - 25 August
	Class-5	Nuclear fission & fusion, Radioactive decay: alpha, beta, gamma decay, electron capture	
	Class-1	Error analysis, Combination of errors, Vernier Calliper	
	Class-2	Screw Gauge, Determination of g using simple pendulum	27 Aug. – 1 Sept.
Chapter-22A: Errors & Experiments	Class-3	Young's modulus by Searle's method, Specific heat of a liquid using calorimeter, focal length of a concave mirror and a convex lens using u-v method, Speed of sound using resonance column, Verification of Ohm's law using voltmeter and ammeter, specific resistance of the material of a wire using meter bridge and post office box	3 Sep. – 8 Sept.

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Chapter-23A: Semiconductors	Class-1	Introduction, Band Theory of Conduction, Types of Semiconductors	
	Class-2	P-N Junction diode, I-V Characteristics in Forward and Reverse bias, Diode as a rectifire	
	Class-3	I-V Characteristics of LED, Photo diode, Solar Cell and Zener Diode, Zener Diode as a voltage regulator	10 Sept 16 Sept.
	Class-4	Logic Gages (OR, AND, NOT, NAND and NOR)	



	CHEMISTRY LECTURE PLAN (PART - A) - JEE	
	Module - 4A Liquid Solutions	
Class 1	Types of solutions and examples, expressing concentrations of solutions, Solubility of solid, liquid and gas in liquid, Henry's law, values of Henry's law constant for gases, Application of Henry's law, Effect of temperature on solubility	
Class 2	Vapour pressure of pure liquids, factors affecting vapour pressure (nature of liquid, effect of intermolecular forces, temperature), Boiling point of liquid (normal and standard boiling point), Trouton's rule	2 to 8 April
Class 3	Vapour pressure of solution- Raoult's law- liquid in liquid, solid in liquid, Vapour pressure composition diagram, composition of liquid phase and vapour phase, Raoult's law as a special case of Henry's law, Ideal and Non ideal solutions,	
Class 4	Azeotropes, Colligative properties, and determination of molecular mass, Vant Hoff factor and Abnormal molar masses of solute	9 to 15 April
Class 5	Problem solving and doubts	
	Module - 4A Chemical Kinetics	
Class 1	Feasibility of reaction, Extent of reaction, Speed of reaction, Rate of a chemical reaction, Types of rates of reactions, Units of rate of reactions, Rate of consumption of reactants, Rate of production of products, Rate laws, Dependence of rate on concentration, Order of reaction, Rate constant, unit of rate constant	9 to 15 April
Class 2	Initial rate of reaction and order of reaction, Elementary reaction and complex reactions, Rate determining step, order of elementary and complex reactions	
Class 3	Integrated rate Equations for Zero order reactions -Integrated rate law, conc. vs time graph, half-life, relation between half-life and concentration, methods for order determination for zero order reaction, examples of zero order reactions	16 to 22 April
Class 4	Integrated rate Equation for First order reactions-Integrated rate law, effect of stoichiometric coefficient on integrated rate expression, conc. vs time graph, half-life, relation between half-life and time taken for 75%, 99.9% etc. completion of reaction, relation between half-life and initial concentration of reactants, degree of dissociation of first order rection, Examples of first order reactions	
Class 5	Study of kinetics of typical first order gas phase reaction, Natural and artificial radioactive decay, pseudo first order reaction-hydrolysis of ester and inversion of cane sugar, Study the effect of conc. and temperature variation on the rate of reaction between sodium thiosulphate and HCl, study of effect of conc. on rate of reaction of iodide ions with H2O2 at room temperature, study of rate of reaction between KIO3 and Na2SO3.	23 to 29 April
Class 6	Temperature dependence of the rate of reaction- temperature coefficient, Arrhenius equation, frequency factor, activated complex, activation energy, method for determination of activation energy, relation between activation energy and enthalpy of reaction, energy, and path of reaction diagram	
Class 7	Effect of catalyst, types of catalysis, effect of catalyst on Gibb's energy, Equilibrium state and equilibrium constant, Collision theory of chemical reactions-Collision frequency, steric factor, drawbacks of collision theory	1 to 7 May
	Module - 4A Electrochemistry	
Class 1	Electrochemical Cell(introduction), Half-cell, Types of half-cell, Daniel Cell (LHE/RHE/Salt Bridge/Cell representation), Galvanic cell, measuring electrode potential using SHE, EMF of cell	1 to 7 May
Class 2 Class 3	Electrochemical Cell and Gibb's energy of cell reaction, Nernst Equation Equilibrium Contant of cell reaction, Concentration cell, pH and half-cell potential of hydrogen electrodes	
Class 4	Conductance of electrolytic solution (Conductance, Conductivity, cell constant, resistance), Measurement of conductivity of ionic solutions-Molar and equivalent conductivity	9 to 15 May
Class 5	Variation of conductivity and molar conductivity with concentration, for strong and weak electrolyte, limiting molar conductivity, Kohlrausch law	
Class 6	Application of Kohlrausch law- Molarconductivity of weak electrolyte, degree of dissociation of weak electrolyte, dissociation constant of weak electrolyte, solubility	16 to 22 May
Class 7	Electrolytic cell, Electrolysis, Faraday's law of electrolysis, product of electrolysis, of Molten NaCl, aq. NaCl, Conc. NaCl(overpotential), dil. H2SO4, Conc. H2SO4 Product of electrolysis of CuSO4, Na2SO4, CuSO4 (using copper electrode), AgNO3, AgNO3 (using silver electrode), NiSO4, Batteries-	
Class 8	Primary and secondary batteries-Lead storage battery, Fuel cell, Corrosion	23 to 29 May
	Module - 5A Organic Concepts I	
Class 1	Fundamental concepts in organic reaction mechanism, substrate, reagent (Electrophile & Nucleophile), Intermediate, product and by product, Fission of a covalent bond, Electron movement in organic reactions, Electron displacement effect in covalent bond, Resonance structure and resonance effect	23 to 29 May
Class 2	Electrophilic Addition Reactions, Free Radical Addition Reactions,	
Class 3	Free Radical Substitution Reactions-Halogenation of Alkane, cycloalkane, allylic Halogenation, and Benzylic halogenation	31 May to 6 June
Class 4 Class 5	Electrophilic Substitution Reactions Dehydration of alcohols (E1 Mechanism)	
Class 6	Dehydrohalogenation of alkyl halides (E2 or 1, 2-Elimination)-Mechanism, Kinetics, Reactivity order, Stereochemistry, Regiochemistry, Saytzeff and Non-Saytzeff product	8 June to 14 June
	Module - 5A Halogen Containing Organic Compound	
Class 1	Introduction, classification of organic halides, Nomenclature, Nature of C-X bonds, Dipole Moments, Methods of preparation of alkyl halides (refer module and NCERT)	8 June to 14 June
Class 2	Physical properties of organic Halides, Chemical Properties of haloalkane, Nucleophilic substitution reactions (refer module and NCERT)	
	Dehydrohalogenation, Preparation of aryl halide (refer module and NCERT), physical properties of aryl halides, Chemical properties	

Class 4	Nucleophilic substitution reactions of aryl halides-Reaction conditions, Reactivity order, Mechanism, Effect of substituent		
Class 5	Reaction with metals-Li, Na, Mg, Preparation of Grignard reagent, Reaction of Grignard reagent (refer module)	22 June to 28 June	
Class 6	Polyhalogen compounds-uses in industry and in agriculture (refer module and NCERT)	ZZ June to Zo June	
	Module - 5A Organic Concepts II		
Class 1	Aliphatic Nucleophilic substitution reactions (refer module)		
Class 2	Aliphatic Nucleophilic substitution reactions (refer module)	30 June to 6 July	
Class 3	Elimination reactions-Dehydrohalogenation of halides and acid catalysed dehydration of Alcohols, Comparison of conditions of substitution and elimination reactions	30 Julie to 0 July	
Class 4	Aromatic Nucleophilic substitution reactions	O livle to 14 livle	
Class 5	Nucleophilic addition reaction, Nucleophilic addition-elimination reaction (Using Grignard Reagent)	8 July to 14 July	
	Module - 5A Oxygen Containing Organic Compound I		
Class 1	Classification, Nomenclature, Structure of functional group, Methods of preparation of alcohol	8 July to 14 July	
Class 2	Physical properties of alcohols, Functional group test of alcohols, acidity of alcohols, chemical properties of alcohols (refer module)	15 July to 21 July	
Class 3	Preparation of phenols, physical properties of phenol, functional group test of phenol, acidity of phenol	, ,	
Class 4	Chemical properties of phenols, commercially important alcohols		
Class 5	Preparation of ethers, physical properties of ethers, chemical properties of ethers-cleavage reaction, electrophilic substitution reaction of aromatic ethers	22 July to 28 July	
	Module - 5A Oxygen Containing Organic Compound II		
Class 1	Introduction of carbonyl compounds, Nomenclature- Common and IUPAC, structure of carbonyl group, keto enol isomerism,	22 July to 28 July	
Class 2	Preparation of aldehyde and ketone-By oxidation of alcohol, By dehydrogenation of alcohols, from hydrocarbons (alkene ad alkyne), from dihalides, from Grignard reagent		
Class 3	Preparation of aldehyde and ketone-from Rosenmund reaction, from Stephn reduction, from reduction of ester, from methyl benzene, from Gatterman-koch reaction, from F. C. reaction	30 July to 5 August	
Class 4	Physical properties of aldehyde and ketone, Chemical reactivity of aldehyde and ketone for nucleophilic addition reaction, mechanism, and stereochemistry of nucleophilic addition reaction		
Class 5	Nucleophilic addition reactions-Addition of HCN, water, Grignard reagent, NaHSO3, alcohols, diols, NH3 and ammonia derivatives	7 August to 13 Augus	
Class 6	Acidity of alpha H atom, H of active methylene group, Aldol reaction and aldol condensation (intermolecular, intramolecular, and cross aldol condensation), Cannizzaro reaction	7 August to 13 Augus	
Class 7	Reduction reaction of aldehyde and ketones, Oxidation of aldehydes and ketones		
Class 8	Perkin reaction, Benzoin condensation, Beckmann rearrangement, Electrophilic Substitution reactions of aromatic aldehyde and aromatic ketone, Uses of aldehydes and ketones, Problems solving and doubts	14 August to 22 Augus	
	Module - 5A Oxygen Containing Organic Compound III		
Class 1	Introduction, Nomenclature (Common and IUPAC), structure of carboxyl group, Methods of preparation of carboxylic acids-from alkene, alkyne, alkyl halide, alcohol, aldehyde	14 August to 22 Augus	
Class 2	Preparation of carboxylic acid- from alkyl benzene, nitrile, amides, Grignard reagent, acid halide, anhydride, ester, Physical properties, Functional group test		
Class 3	Acidity of carboxylic acids, Chemical properties of Carboxylic acids, - formation of anhydride, esterification, reaction with PCI3, PCI5 and SOCI2, reaction with ammonia	23 August to 29 Augus	
Class 4	Reduction of carboxylic acid, Decarboxylation, HVZ reaction, Electrophilic substitution reaction of aromatic acid, uses of crboxylic acid		
Class 5	Carboxylic acid derivatives- type, structure, naming. Preparation, Nucleophilic acyl substitution reaction of acid derivatives, Hydrolysis of ester, Claisen ester condensation, Hoffman bromamide reaction	31 August to 6 Septemb	



MATHEMATICS LECTURE PLAN (PART – A) – JEE

MODULE – 4A

		Part A	Week
	Class-1	Cartesian product of two sets, Types of Relations	
	Class-2	Domain of Functions	2 April – 7 April
	Class-3	Standard Functions, Log, [.], {.}, sgn(.) properties	
	Class-4	Even-Odd Function, Periodic Functions	
Chapter-14: Functions	Class-5	Transformation – 1, $x \to x \pm a$, $y \to y \pm a$, $x \to -x$, $y \to -y$, $x \to x $ $y \to y $, $f(x) \to f(x) $	9 April – 14 April
	Class-6	Transformation – 2, $f(x) \rightarrow [f(x)]$, $f(x) \rightarrow \{f(x)\}$	
	Class-7	Range of Function	16 April 21 April
	Class-8	Mixed Problems	16 April – 21 April
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Chapter-15:	Class-1	Basic ITF + Graphs + Basic Properties of Graphs	
Inverse Trigonometric	Class-2	$f(f^{-1}(x))$ and $f^{-1}(f(x))$	23 April – 28 April
Functions	Class-3	$\tan^{-1} x \pm \tan^{-1} y$ and ITF Series	23710111 20710111
	Class-4	Problem Solving	
	Class-1	Introduction of Limits, LHL, RHL, Indeterminate forms	30 April – 5 May
Chapter-16: Differential	Class-2	Standard Templates of Limits : Algebraic, Trigonometry, Inverse Trigonometry	307(prii 3 iviay
Calculus - I	Class-3	Logarithmic Limit, Exponential Limit and $\left(1\right)^{\infty}$ form	7 May – 12 May
	Class-4	Continuity of Functions, Types of Discontinuities	,ay 12ay
	Class-5	Differentiability definition, LHD, RHD	
Chapter-16:	Class-6	Differentiation First Principle, Rules (Products, Quotient, Chain)	14 May – 19 May
Differential	Class-7	Logarithmic, Parametric Differentiation, Implicit	
Calculus - I	Class-8	LH Rule, Series Expansion and Finding an Unknown Variable	
	Class-9	Problem Solving	21 May – 26 May
Chapter-17: Differential	Class-1	Approximation and Rate Measurement and Slope of Tangent and Normal	
Calculus - II	Class-2	Equation of Tangent of Normal	20 May 2 lines
	Class-3	LMVT and Rolle's Theorem	28 May – 2 June
Chapter-17:	Class-4	Increasing and Decreasing Functions	
Differential	Class-5	Local Maxima and Minima	4 June – 9 June
Calculus - II	Class-6	Word Problems based on Local Maxima and Minima	
	Class-7	Types of Function + Problem Solving	11 June – 16 June

MODULE - 5A

	Class-1	Antiderivative Formula based	11 June – 16
Chapter-18:	Class-2	Methods of Substitution	June
Integral	Class-3	Problem Solving	
Calculus - 1	Class-4	Integral of the form \sqrt{Q} , $L\sqrt{Q}$, $\frac{1}{Q}$, $\frac{L}{Q}$, $\frac{L}{\sqrt{Q}}$, $\frac{L}{p(x)}$	18 June-23 June

Chapter-18: Integral	Class-5	Integration of the form $\frac{1}{a\sin^2 x + b\cos^2 x + c\sin x\cos x + d},$ $\frac{1}{a\sin x + b\cos x + c}$	25 June-30 June
Calculus - 1	Class-6	Integration by parts, Integration of the form $\int e^x (f(x) + f'(x)) dx$	
	Class-7	Integration of irrational functions, Partial fractions	
	Class-8	Reduction Method, Problem Solving	
Chapter 10:	Class-1	Basic Properties of definite integral	2 July-7 July
Chapter-19: Integral Calculus - 2	Class-2	Basic Properties of definite integral-2	
	Class-3	Problem Solving	0 July 14 July
Calculus - Z	Class-4	Periodic Properties, Leibnitz Rule	9 July-14 July

Chapter-19:	Class-5	Integral as Limit of Sum and vice versa	
Integral	Class-6	Area under the Curve	16 July-21 July
	Class-7	Estimation of Integral and Inequalities	
Calculus - 2	Class-8	Problem Solving	
Chapter-20:	Class-1	Order, Degree and formation of Differential Equation	23 July-28 July
Differential	Class-2	Variable Separable, Homogeneous & their Reducible form	
Equation	Class-3	Linear Differential Equation and its Reducible form	20 July 4 August
	Class-4	Application of DE, Word Problem, Orthogonal trajectory	30 July-4 August

Chapter-20: Differential Equation	Exact DE, Problem Solving	6 August - 11 August
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MODULE - 6A

	Class-1	Basics of Vectors, Definition, Addition, Collinearity, Co-planarity	6 August - 11 August
	Class-2	Dot Product, Cross Product	
Chapter-21: Vectors	Class-3	STP (Volume of Tetrahedron), VTP	12 August 10
	Class-4	Problem Solving	13 August - 18 August
	Class-5	Reciprocal system, Vector Equations	
	Class-6	Problem Solving	20 August 25
Chapter-22: 3-D Geometry	Class-1	Basic formula, Direction cosines, Direction Ratios	- 20 August - 25 August

Chapter-22: 3-D Geometry	Class-2	Lines (Different forms), Shortest Distance between skew lines	27 Aug. – 1 Sept.
	Class-3	Planes and their forms	
	Class-4	Planes and Lines	
	Class-5	Problem Solving	
	Class-6	Problem Solving	
Chapter-23: Probability	Class-1	Definition of Probability, Mutually exclusive and Exhaustive events	- 3 Sep. – 8 Sept.
	Class-2	Problem Solving on P & C based	
	Class-3	Simple Events, Compounds Events, Set Theory based problems	10 Sept 15 Sept.
Chapter-23: Probability	Class-4	Conditional probability, Definition of Independent Events	
	Class-5	Problem Solving	17 Sept 22 Sept.
	Class-6	Law of total Probability, Bayes Theorem	
	Class-7	Problem Solving	
	Class-8	Binomial Distribution, Mean, Variance	24 Sept 29 Sept.
Chapter-24:	Class-1	Definition and types of Matrices	
Matrices and Determinants	Class-2	Addition and Multiplication of Matrices, their properties	
	Class-3	Adjoint and its properties, Inverse of a Matrix and Its Properties	1 Oct 6 Oct.
Chapter-24: Matrices and Determinants	Class-4	Solving of Simultaneous Equations	
	Class-5	Problem Solving	8 Oct 13 Oct.
	Class-6	Properties of Determinant	
	Class-7	Problem Solving	15 Oct 20 Oct.