

NEET 2021 Syllabus for Physics

Class 11

- Physical-world and measurement
- Kinematics
- Laws of Motion
- Work, Energy and Power
- Motion of System of Particles and Rigid Body
- Gravitation
- Properties of Bulk Matter
- Thermodynamics
- Behaviour of Perfect Gas and Kinetic Theory
- Oscillations and Waves

Class 12

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

NEET chapter-wise weightage for Physics

Name of the chapter	Number of questions asked (Approx.)	Weightage in percentile
Alternating current	1	4
Atoms	0-1	1.5
Current electricity	2	8
Dual Nature of Radiation and Matter	2	6
Electric Charges and Fields	1	4.5
Electromagnetic induction	1	4
Electromagnetic waves	1	5
Electrostatic Potential and Capacitance	1	4.5
Gravitation	0-1	2
Kinetic theory	1	3
Laws of Motion	1	3
Magnetism and Matter	1	2.5
Mechanical Properties of Fluids	0-1	2
Mechanical Properties of Solids	0-1	2
Motion in a Plane	0-1	1.5
Motion in a Straight Line	0-1	1.5
Moving Charges and Magnetism	1	2.5
Nuclei	0-1	1.5

Oscillations	0-1	1.5
Physical World, Units and Measurements	0-1	2
Ray optics and optical instruments	1	5
Semiconductor Electronics: Materials, Devices and Simple Circuits	2	6
System of Particles and Rotational Motion	1	5
Thermal Properties of Matter	0-1	2
Thermodynamics	2	9
Wave optics	1	5
Waves	0-1	1.5
Work, Energy and Power	1	4
Total	45	100

Best books for NEET physics

1. 40 Days Physics for NEET by S B Tripathi
2. Concepts of Competition Physics for CBSE PMT by Agarwal
3. Concepts of Physics by H C Verma
4. Fundamental Physics by Pradeep
5. Fundamentals of Physics by Halliday, Resnick, and Walker
6. NCERT Physics by Anil Aggarwal
7. Objective Physics By D C Pandey
8. Objective Physics by Prof. Satya Prakash Arya (MTG Publishers)
9. Physics for NEET by C P Singh
10. Problems in General Physics by I E Irodov

JEE Main 2021 Syllabus: Physics

Physics is one of the major sections of JEE Syllabus 2021. Students have to answer 30 questions carrying 4 marks each for correct answer or the best answer. JEE Main syllabus for Physics comprises topics like Kinematics, Optics, Laws Of Motion, Rotational Motion, Gravitation, Properties of Solids And Liquids etc. Last year, the highest weightage in Physics was given to topics like current electricity, alternating current, Rotational dynamics, Modern Physics etc. JEE Mains 2021 syllabus includes two sections A and B. Section A includes Theory part with 80% weightage and section B contains practical component (experimental skills) with 20% weightage. Check out the full JEE 2021 syllabus for Physics below. The reduced syllabus of JEE main for Physics is also given.

Units	Topics
Unit 1: Physics And Measurement	<ul style="list-style-type: none"> • Physics, technology and society, S I units, Fundamental and derived units • Least count, accuracy and precision of measuring instruments, • Errors in measurement, • Dimensions of Physical quantities, dimensional analysis and its applications
Unit 2: Kinematics	<ul style="list-style-type: none"> • 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 graphs, 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	<ul style="list-style-type: none"> • Force and Inertia, • Newton's First Law of motion; Momentum, Newton's Second Law of motion; Impulse; 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 constant force and a variable force; kinetic and potential energies, work energy theorem, power.
	Potential energy of a spring, conservation of mechanical energy, conservative and non-conservative forces; Elastic and inelastic collisions in one and two dimensions.

Unit 5: Rotational Motion	<ul style="list-style-type: none"> • Centre of mass of a two-particle system, Centre of mass of a rigid body; Basic concepts of rotational motion; moment of a force, torque, angular momentum, conservation of angular momentum and its applications; moment of inertia, 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	<ul style="list-style-type: none"> • The universal law of gravitation. • Acceleration due to gravity and its variation with altitude and depth. • Kepler's laws 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	<ul style="list-style-type: none"> • Elastic behaviour, 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 heat capacity, calorimetry; change of state, latent heat. • Heat transfer-conduction, convection and radiation, Newton's law of cooling.
Unit 8: Thermodynamics	<ul style="list-style-type: none"> • Thermal equilibrium, zeroth law of thermodynamics, concept of temperature. • Heat, work and internal energy. • First law of thermodynamics. • Second law of thermodynamics: reversible and irreversible processes. • Carnot engine and its efficiency.
Unit 9: Kinetic Theory Of Gases	<ul style="list-style-type: none"> • Equation of state of a perfect gas, work done on compressing a gas. • Kinetic theory of gases – assumptions, 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	<p>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</p>

	<p>energies; Simple pendulum – derivation of expression for its time period; Free, forced and damped oscillations, resonance</p> <p>Wave motion. Longitudinal and transverse waves, speed of a wave. Displacement relation for a progressive wave. Principle of superposition of waves, reflection of waves, Standing waves in strings and organ pipes, fundamental mode and harmonics, Beats, Doppler effect in sound</p>
Unit 11: Electrostatics	<p>Electric charges: Conservation of charge, Coulomb’s law-forces between two point charges, forces between multiple charges; superposition principle and continuous charge distribution.</p>
	<p>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. -Conductors and insulators, Dielectrics and electric polarization, capacitor, combination of capacitors in series and in parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, Energy stored in a capacitor.</p>
Unit 12: Current Electricity	<ul style="list-style-type: none"> • Electric current, Drift velocity, Ohm’s law, Electrical resistance, Resistances of different materials, V-I characteristics of Ohmic and nonohmic 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, combination of cells in series and in parallel. • Kirchoff’s laws and their applications. • Wheatstone bridge, Metre bridge. • Potentiometer – principle and its applications.
Unit 13: Magnetic Effects Of Current And Magnetism	<ul style="list-style-type: none"> • 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. Force between two parallel current-carrying conductors-definition of ampere. Torque experienced by a current loop in 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 ferro- magnetic substances. • Magnetic susceptibility and permeability, Hysteresis, Electromagnets and permanent magnets.

<p>Unit 14: Electromagnetic Induction And Alternating Currents</p>	<ul style="list-style-type: none"> • 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.
<p>Unit 15: Electromagnetic Waves</p>	<ul style="list-style-type: none"> • Electromagnetic waves and their characteristics. Transverse nature of electromagnetic waves. • Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, Xrays, gamma rays). • Applications of e.m. waves.
<p>Unit 16: Optics</p>	<p>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.</p> <p>Wave optics</p> <ul style="list-style-type: none"> • wavefront and Huygens' principle, Laws of reflection and refraction using Huygen's principle. Interference, Young's double slit experiment and expression for fringe width. • Diffraction due to a single slit, width of central maximum. • Resolving power of microscopes and astronomical telescopes, Polarisation, plane polarized light; Brewster's law, uses of plane polarized light and Polaroids.
<p>Unit 17: Dual Nature Of Matter And radiation</p>	<ul style="list-style-type: none"> • 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.
<p>Unit 18: Atoms And Nuclei</p>	<ul style="list-style-type: none"> • 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.
<p>Unit 19: Electronic Devices</p>	<ul style="list-style-type: none"> • Semiconductors; semiconductor diode: I-V characteristics in forward and reverse bias; diode as a rectifier; I-V characteristics of LED, 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.

Unit 20: Communication Systems	<ul style="list-style-type: none"> • Propagation of electromagnetic waves in the atmosphere; Sky and space wave propagation, • Need for modulation, • Amplitude and Frequency Modulation, • Bandwidth of signals, • Bandwidth of Transmission medium, • Basic Elements of a Communication System (Block Diagram only).
Section B Unit 21: Experimental Skills	Familiarity with the basic approach and observations of the experiments and activities

JEE Mains 2021 Syllabus: Topicwise Weightage for Physics

Below is the previous years' JEE Main physics topics, number of questions asked and marks distribution in the exam.

Topics	No of Questions	Marks	Weightage
Electrostatics	1	4	3.33%
Current Electricity	3	12	10.00%
Capacitor	1	4	3.33%
Magnetic Effect of Current & Magnetism	2	8	6.67%
Alternating Current	2	8	6.67%
KTG & Thermodynamics	2	8	6.67%
SHM	1	4	3.33%
Sound Waves	1	4	3.33%
KInematics	1	4	3.33%
Work Power Energy	1	4	3.33%
Kinematics	1	4	3.33%
Laws of motion	1	4	3.33%

Work,Power and Energy	1	4	6.67%
Centre Of Mass	2	8	6.67%
Rotational Dynamics	2	8	6.67%
Modern Physics	2	8	6.67%
NLM	1	4	3.33%
Elasticity	1	4	3.33%
Wave Optics	2	8	6.67%
Error	1	4	3.33%
Circular Motion	1	4	3.33%
Electromagnetic Waves	1	4	3.33%
Semiconductors	1	4	3.33%
Communication System	1	4	3.33%
Total	30	120	100%

Best Books to cover JEE Main 2021 Official Syllabus (Physics)

- Advanced Physics (Author: Nelkon and Parker)
- Concepts of Physics Volume 1 and Volume 2 (Author: H.C. Verma)
- Feynman Lectures on Physics (Author: Feynman, Leighton and Sands)
- Fundamentals of Physics (Author: Halliday, Resnick and Walker)
- Objective Questions on Physics- Chapterwise Solved Papers (Author: D.C. Pandey)
- Problems in General Physics (Author: IE Irodov)
- Problems in Physics (Author: AA Pinsky)