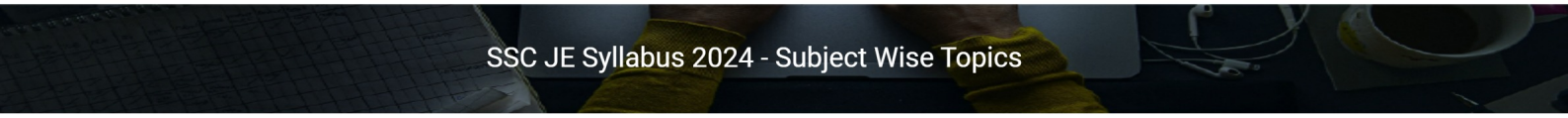
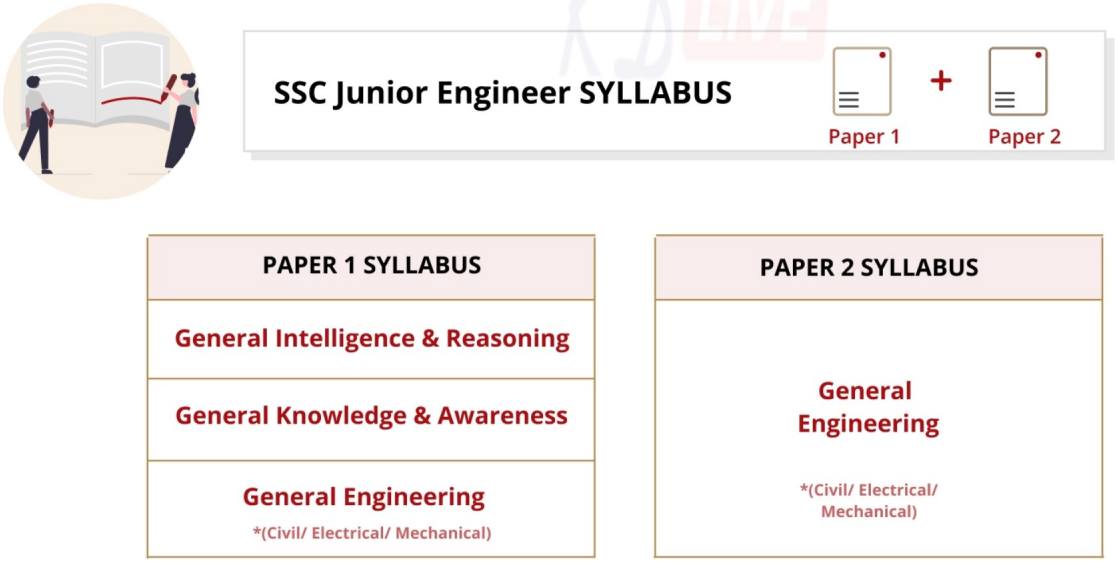


SSC conducts the SSC JE exam to recruit candidates for the posts of Junior Engineer (Civil, Mechanical, and Electrical) for various organizations and offices of the Government of India. This year, SSC released the notification for SSC JE recruitment 2024 on March 28, 2024. To successfully clear this recruitment process, you must thoroughly cover the SSC JE syllabus 2024. In this blog, we have detailed the SSC JE syllabus 2024, outlining the topics and exam pattern comprehensively.

So, buckle up and let's dive into the SSC JE syllabus 2024!

SSC JE Syllabus 2024 - Exam Overview

The SSC JE Computer Based Examination will be conducted in two papers: Paper I and Paper II. Paper I includes three subjects: General Intelligence and Reasoning, General Awareness, and General Engineering. Paper II is solely based on General Engineering. You will be required to attempt the General Engineering part (i.e., Part-A, Part-B, or Part-C) in both Paper I and Paper II, based on your selected Stream/Subject of Educational Qualification in the online application form. Let's now take a minute to review the subjects covered in the SSC JE Syllabus 2024 before getting into the specifics.



[Source: KD Live]

SSC JE 2024 Exam Pattern - Paper I

First, we will guide you through the SSC JE exam pattern, followed by an in-depth look at the SSC JE syllabus 2024. Below, we have included an image from the official notification that outlines the exam pattern for SSC JE Paper I:

Papers	Mode of Examination	Subject	Number of Questions /Maximum Marks	Duration
Paper-I	Computer Based Examination	(i) General Intelligence and Reasoning	50/ 50	2 Hours (2 hours and 40 minutes for the candidates who are eligible for scribe as per **Para-9.1, 9.2 and 9.3**)
		(ii) General Awareness	50/ 50	
		(iii) Part-A: General Engineering (Civil & Structural) or Part-B: General Engineering (Electrical) or Part-C: General Engineering (Mechanical)	100/ 100	

[Source: ssc.gov.in]

- Paper I will consist solely of objective type, multiple-choice questions. The questions will be set in both Hindi and English.
- There will be a negative marking of 0.25 marks for each wrong answer in Paper I.
- The total duration of the exam will be 2 hours.
- In Paper I, there will be a total of 200 questions with a maximum achievable score of 200.

Now that you are familiar with the exam pattern, let's delve into the detailed SSC JE syllabus 2024 for Paper I.

SSC JE Syllabus 2024 for General Intelligence & Reasoning

The detailed breakdown of the SSC JE syllabus 2024 for General Intelligence & Reasoning is as follows:

- Analogies
- Similarities and Differences
- Space Visualization
- Problem Solving
- Analysis
- Judgment
- Decision Making
- Visual Memory
- Discriminating Observation
- Relationship Concepts
- Arithmetical Reasoning
- Verbal and Figure Classification
- Arithmetical Number Series
- Non-Verbal Series

SSC JE Syllabus 2024 for General Awareness

In this section, the questions will be aimed at testing your general awareness of the environment around you and its application to society. They will also be designed to assess your knowledge of current events and everyday observations and experiences from a scientific perspective, as expected of any educated person. The test will include questions related to India and its neighbouring countries, especially concerning History, Culture, Geography, Economic Scene, General Polity, and Scientific Research. These questions will be designed so that you do not need to have specialized knowledge in any particular discipline.

Below we have provided a few topics covered under SSC JE syllabus 2024 for General Awareness:

- Ancient History
- Medieval History
- Modern History
- Geography
- Polity
- Physics
- Chemistry
- Biology
- Science and Technology
- Economics
- Art and Culture
- Current Affairs
- Static GK

SSC JE Syllabus 2024 for General Engineering

As you are already aware, Paper I of the General Engineering section includes three parts: Part A (Civil & Structural), Part B (Electrical), and Part C (Mechanical). Below, we have provided the topics included in each of these parts.

Part - A (Civil Engineering)

- Building Materials
- Estimating
- Costing and Valuation
- Surveying
- Soil Mechanics
- Hydraulics
- Irrigation Engineering
- Transportation Engineering
- Environmental Engineering
- Structural Engineering: Theory of Structures, Concrete Technology, RCC Design, Steel Design.

Part - B (Electrical Engineering)

- Basic concepts
- Circuit law
- Magnetic Circuit
- AC Fundamentals
- Measurement and Measuring instruments
- Electrical Machines
- Fractional Kilowatt Motors and single-phase induction Motors
- Synchronous Machines
- Generation
- Transmission and Distribution
- Estimation and Costing
- Utilization and Electrical Energy
- Basic Electronics.

Part - C (Mechanical Engineering)

- Theory of Machines and Machine Design
- Engineering Mechanics and Strength of Materials
- Properties of Pure Substances
- 1st Law of Thermodynamics, 2nd Law of Thermodynamics
- Air Standard cycles for IC Engines
- IC Engine Performance
- IC Engines Combustion
- IC Engine Cooling & Lubrication
- Rankine cycle of System
- Boilers
- Classification
- Specification
- Fitting & Accessories
- Air Compressors & their cycles
- Refrigeration cycles
- Principle of Refrigeration Plant
- Nozzles & Steam Turbines
- Properties & Classification of Fluids
- Fluid Statics
- Measurement of Fluid Pressure
- Fluid kinematics
- Dynamics of Ideal Fluids
- Measurement of Flow rate
- Basic Principles
- Hydraulic Turbines
- Centrifugal Pumps
- Classification of Steel.

Now that you are fully aware of the SSC JE syllabus 2024 for Paper I, let's move on to providing you with all the information regarding Paper II.

SSC JE 2024 Exam Pattern - Paper II

Now that you are aware of the SSC JE syllabus 2024 for Paper I, let's move on to learn about Paper II. Knowing the structure of the exam helps in planning your study schedule effectively. You can allocate time and resources to each section according to its weight and difficulty level. Thus, understanding the SSC JE Exam Pattern for Paper II is very crucial. We have provided a snip of the SSC JE exam pattern below for your reference:

Papers	Mode of Examination	Subject	Number of Questions /Maximum Marks	Duration
Paper-II	Computer Based Examination	Part-A: General Engineering (Civil & Structural) or Part-B: General Engineering (Electrical) or Part-C: General Engineering (Mechanical)	100/ 300	2 Hours (2 hours and 40 minutes for the candidates who are eligible for scribe as per **Para 9.1, 9.2 and 9.3**)

[Source: ssc.gov.in]

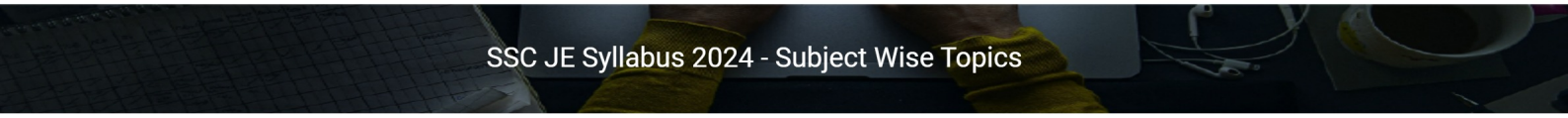
- Paper II involves objective-type multiple-choice questions and is a Computer-Based Exam.
- The medium of examination is available in both Hindi and English.
- There is a negative marking of 1 mark for each incorrect answer in Paper II.
- Paper II includes a total of 100 questions, with a maximum score of 300 marks.
- Paper II will have a duration of 2 hours.

Now that you are aware of the exam pattern, how about we walk you through the SSC JE syllabus 2024 for Paper II in detail?

SSC JE Syllabus 2024 for Civil Engineering

We have detailed the SSC JE syllabus 2024 for Civil Engineering below:

- **Building Materials:** Physical and Chemical properties, classification, standard tests, uses and manufacture/quarrying of materials e.g., building stones, silicate-based materials, cement (Portland), asbestos products, timber and wood-based products, laminates, bituminous materials, paints, varnishes.
- **Estimating, Costing and Valuation:** estimate, glossary of technical terms, analysis of rates, methods and unit of measurement, Items of work – earthwork, Brick work (Modular & Traditional bricks), RCC work, Shuttering, Timber work, Painting, Flooring, Plastering, Boundary wall, Brick building, Water Tank, Septic tank, Bar bending schedule, Centre line method, Midsection formula, Trapezodial formula, Simpson's rule, Cost estimate of Septic tank, flexible pavements, Tube well, isolates and combined footings, Steel Truss, Piles and pile-caps. Valuation – Value and cost, scrap value, salvage value, assessed value, sinking fund, depreciation and obsolescence, methods of valuation.
- **Surveying:** Principles of surveying, measurement of distance, chain surveying, working of prismatic compass, compass traversing, bearings, local attraction, plane table surveying, theodolite traversing, adjustment of theodolite, Levelling, Definition of terms used in levelling, contouring, curvature and refraction corrections, temporary and permanent adjustments of dumpy level, methods of contouring, uses of contour map, tachometric survey, curve setting, earthwork calculation, advanced surveying equipment.
- **Soil Mechanics:** Origin of soil, phase diagram, Definitions-void ratio, porosity, degree of saturation, water content, specific gravity of soil grains, unit weights, density index and interrelationship of different parameters, Grain size distribution curves and their uses Index properties of soils, Atterberg's limits, ISI soil classification and plasticity chart Permeability of soil, coefficient of permeability, determination of coefficient of permeability, Unconfined and confined aquifers, effective stress, quick sand, consolidation of soils, Principles of consolidation, degree of consolidation, pre-consolidation pressure, normally consolidated soil, e- log p curve, computation of ultimate settlement Shear strength of soils, direct shear test, Vane shear test, Triaxial test Soil compaction, Laboratory compaction test, Maximum dry density and optimum moisture content, earth pressure theories, active and passive earth pressures, Bearing capacity of soils, plate load test, standard penetration test.
- **Hydraulics:** Fluid properties, hydrostatics, measurements of flow, Bernoulli's theorem and its application, flow through pipes, flow in open channels, weirs, flumes, spillways, pumps and turbines.
- **Irrigation Engineering:** Definition, necessity, benefits, 2II effects of irrigation, types and methods of irrigation, Hydrology – Measurement of rainfall, run off coefficient, rain gauge, losses from precipitation – evaporation, infiltration, etc. Water requirement of crops, duty, delta and base period, Kharif and Rabi Crops, Command area, Time factor, Crop ratio, Overlap allowance, Irrigation efficiencies Different types of canals, types of canal irrigation, loss of water in canals Canal lining – types and advantages Shallow and deep to wells, yield from a well Weir and barrage, Failure of weirs and permeable foundation, Slit and Scour, Kennedy's theory of critical velocity Lacey's theory of uniform flow Definition of flood, causes and effects, methods of flood control, water logging, preventive measure Land reclamation, Characteristics of affecting fertility of soils, purposes, methods, description of land and reclamation processes Major irrigation projects in India.
- **Transportation Engineering:** Highway Engineering – cross-sectional elements, geometric design, types of pavements, pavement materials – aggregates and bitumen, different tests, Design of flexible and rigid pavements – Water Bound Macadam (WBM) and Wet Mix Macadam (WMM), Gravel Road, Bituminous construction, Rigid pavement joint, pavement maintenance, Highway drainage, Railway Engineering- Components of permanent way – sleepers, ballast, fixtures and fastening, track geometry, points and crossings, track junction, stations and yards Traffic Engineering – Different traffic survey, speed-flow-density and their interrelationships, intersections and



The SSC JE syllabus 2024 for Civil Engineering is quite extensive, isn't it? But don't worry—with consistency, discipline, and hard work, you can cover the entire SSC JE syllabus 2024 thoroughly. You've got this!

SSC JE Syllabus 2024 - Electrical Engineering

Below, you will find the SSC JE syllabus 2024 for Electrical Engineering:

- **Basic Concepts:** Concepts of resistance, inductance, capacitance, and various factors affecting them Concepts of current, voltage, power, energy and their units.
- **Circuit Law:** Kirchhoff's law, Simple Circuit solution using network theorems.
- **Magnetic Circuit:** Concepts of flux, mmf, reluctance, Different kinds of magnetic materials, Magnetic calculations for conductors of different configurations e.g., straight, circular, solenoidal, etc. Electromagnetic induction, self and mutual induction.
- **AC Fundamentals:** Instantaneous, peak, RMS and average values of alternating waves, Representation of sinusoidal wave form, simple series and parallel AC Circuits consisting of RL and C, Resonance, Tank Circuit Poly Phase system – star and delta connection, 3 phase power, DC and sinusoidal response of R-Land R-Circuit.
- **Measurement and Measuring Instruments:** Measurement of power (1 phase and 3 phase, both active and re-active) and energy, 2 wattmeter methods of 3 phase power measurement, Measurement of frequency and phase angle Ammeter and voltmeter (both moving oil and moving iron type), extension of range wattmeter, Multimeters, Megger, Energy meter AC Bridges Use of CRO, Signal Generator, CT, PT and their uses Earth Fault detection.
- **Electrical Machines:** (a) DC Machine – Construction, Basic Principles of DC motors and generators, their characteristics, speed control and starting of DC Motors Method of braking motor, Losses and efficiency of DC Machines (b) 1 phase and 3 phase transformers – Construction, Principles of operation, equivalent circuit, voltage regulation, OC and SC Tests, Losses and efficiency Effect of voltage, frequency and wave form on losses Parallel operation of 1 phase /3 phase transformers Auto transformers (c) 3 phase induction motors, rotating magnetic field, principle of operation, equivalent circuit, torque speed characteristics, starting and speed control of 3 phase induction motors Methods of braking, effect of voltage and frequency variation on torque speed characteristics Fractional Kilowatt Motors and Single-Phase Induction Motors: Characteristics and applications.
- **Synchronous Machines -** Generation of 3-phase emf armature reaction, voltage regulation, parallel operation of two alternators, synchronizing, control of active and reactive power Starting and applications of synchronous motors.
- **Generation, Transmission and Distribution:** Different types of power stations, Load factor, diversity factor, demand factor, cost of generation, inter-connection of power stations Power factor improvement, various types of tariffs, types of faults, short circuit current for symmetrical faults Switchgears – rating of circuit breakers, Principles of arc extinction by oil and air, HRC Fuses, Protection against earth leakage / over current, etc. Buchholtz relay, Merz-Price system of protection of generators & transformers, protection of feeders and bus bars Lightning arresters, various transmission and distribution system, comparison of conductor materials, efficiency of different system Cable – Different types of cables, cable rating and derating factor.
- **Estimation and costing:** Estimation of lighting scheme, electric installation of machines and relevant IE rules Earthing practices and IE Rules.
- **Utilization of Electrical Energy:** Illumination, Electric heating, Electric welding, Electroplating, Electric drives and motors

The SSC JE syllabus 2024 for Electrical Engineering might appear intimidating, but we have confidence in you!

SSC JE Syllabus 2024 - Mechanical Engineering

Below is the detailed SSC JE syllabus 2024 for Mechanical Engineering:

- **Theory of Machines and Machine Design:** Concept of a simple machine, four bar linkage and link motion, Flywheels and fluctuation of energy, Power transmission by belts – V-belts and Flat belts, Clutches – Plate and Conical clutch, Gears – Type of gears, gear profile and gear ratio calculation, Governors – Principles and classification, Riveted joint, Cams, Bearings, Friction in collars and pivots.
- **Engineering Mechanics and Strength of Materials:** Equilibrium of Forces, Law of motion, Friction, Concepts of stress and strain, Elastic limit and elastic constants, bending moments and shear force diagram, Stress in composite bars, Torsion of circular shafts, Bucking of columns–Euler's and Rankin's theories, Thin-walled pressure vessels.
- **Thermal Engineering:**
  - **Properties of Pure Substances:** p-v & P-T diagrams of pure substance like H2O, Introduction of steam table with respect to steam generation process; definition of saturation, wet & superheated status Definition of dryness fraction of steam, degree of superheat of steam H-s chart of steam (Mollier's Chart).
  - **1st Law of Thermodynamics:** Definition of stored energy & internal energy, 1st Law of Thermodynamics of cyclic process, Non-Flow Energy Equation, Flow Energy & Definition of Enthalpy, Conditions for Steady State Steady Flow; Steady State Steady Flow Energy Equation.
  - **2nd Law of Thermodynamics:** Definition of Sink, Source Reservoir of Heat, Heat Engine, Heat Pump & Refrigerator; Thermal Efficiency of Heat Engines & co-efficient of performance of Refrigerators, Kelvin – Planck & Clausius Statements of 2nd Law of Thermodynamics, Absolute or Thermodynamic Scale of temperature, Clausius Integral, Entropy, Entropy change calculation of ideal gas processes Carnot Cycle & Carnot Efficiency, PMM-2; definition & its impossibility.
  - **Air standard Cycles for IC engines:** Otto cycle; plot on P-V, T-S Planes; Thermal Efficiency, Diesel Cycle; Plot on P-V, T-S planes; Thermal efficiency. IC Engine Performance, IC Engine Combustion, IC Engine Cooling & Lubrication.
  - **Rankine cycle of steam:** Simple Rankine cycle plot on P-V, T-S, h-splanes, Rankine cycle efficiency with & without pump work Boilers; Classification; Specification; Fittings & Accessories: Fire Tube & Water Tube Boilers Air Compressors & their cycles; Refrigeration cycles; Principle of a Refrigeration Plant; Nozzles & Steam Turbines
- **Fluid Mechanics & Machinery:**
  - **Properties & Classification of Fluid:** ideal & real fluids, Newton's law of viscosity, Newtonian and Non-Newtonian fluids, compressible and incompressible fluids.
  - **Fluid Statics:** Pressure at a point.
  - **Measurement of Fluid Pressure:** Manometers, U-tube, Inclined tube.
  - **Fluid Kinematics:** Stream line, laminar & turbulent flow, external & internal flow, continuity equation.
  - **Dynamics of ideal fluids:** Bernoulli's equation, Total head; Velocity head; Pressure head; Application of Bernoulli's equitation

As we come to the end of our SSC JE Syllabus 2024 blog, remember that by practising daily, staying determined and staying consistent you can ace this exam. We hope that this blog has provided you with an in-depth analysis of SSC JE Syllabus 2024. A systematic strategy and careful planning are essential for every subject from Civil Engineering to General Intelligence and Reasoning. This blog's in-depth analysis acts as an informative guide for grasping different subjects and subtopics you should pay attention to. You can read our blogs on KD Live. Wishing you all the best for your SSC JE Exam!