

GATE Syllabus 2024

GATE 2024 syllabus is the officially released PDF carrying essential topics for the upcoming exam in February 2024. All the topics in the syllabus are designed in a way to test the Recall, Analysis and Synthesis, Comprehension, and Application skills of the candidates. The GATE syllabus is an essential part of the preparation for the upcoming exam and will carry all the topics on which the exam paper will be based.

A deeper and clearer understanding of the GATE 2024 syllabus will help candidates plan their preparation strategy effectively. There are 29 disciplines mentioned in the GATE exam, and each individual branch has a specific syllabus released by the officials. The GATE syllabus 2024 can be downloaded from the link provided below:

GATE 2024 Syllabus PDF

The [GATE Exam](#) is conducted each year for 29 disciplines. Candidates can download the branch-wise individual GATE Syllabus 2024 PDF of all branches participating in the exam can be downloaded from the links provided below:

1. [Aerospace Engineering Syllabus](#)
2. [Agricultural Engineering Syllabus](#)
3. [Architecture & Planning Syllabus](#)
4. [Biotechnology Syllabus](#)
5. [Civil Engineering Syllabus](#)
6. [Syllabus of Chemical Engineering](#)
7. [GATE Syllabus for CSE PDF](#)
8. [Chemistry Syllabus](#)
9. [GATE Syllabus for ECE](#)
10. [Electrical Engineering](#)
11. [Ecology and Evolution](#)
12. [Geology](#)
13. [Instrumentation](#)
14. [GATE Syllabus for Mathematics](#)
15. [GATE Syllabus Mechanical](#)
16. [Mining Engineering](#)
17. [Metallurgical Engineering](#)
18. [Petroleum Engineering](#)
19. [Physics](#)
20. [Production and Industrial Engineering](#)
21. [Textile Engineering and Fibre Science](#)
22. [Statistics](#)
23. [Biomedical Engineering](#)
24. [XE \(Engineering Sciences\) Syllabus](#)
25. [Life Science Syllabus](#)
26. [Humanities and Human Sciences](#)
27. [Environmental Science and Engineering](#)
28. [Geomatics Engineering](#)
29. [Naval Architecture and Marine Engineering](#)

Discipline-wise GATE Exam Syllabus

The topic-wise breakdown of the GATE syllabus is provided here. Along with the [GATE notes](#), the syllabus is an important aspect of effective exam preparation. Knowing the topics covered in the exam syllabus will help candidates allot their time according to the importance of the topic. Below we have shared the subject-wise list of all the topics covered in the GATE exam syllabus.

GATE Syllabus CSE

There are various topics in the Computer Science Engineering syllabus, such as tuple calculus, Lexical analysis, SQL, etc. Check out all the important topics of the CSE syllabus for GATE below.

- Engineering Mathematics
- Digital Logic
- Computer Organization and Architecture
- Programming and Data Structures
- Algorithms Theory of Computation
- Compiler Design Operating System
- Databases Computer Networks

GATE 2024 Syllabus Mechanical

Mechanics of Materials, Theory of Machines, and Vibrations are some essential parts of the GATE Syllabus for Mechanical Engineering. Check out the important topics covered in the ME syllabus for GATE:

- Engineering Mathematics
- Applied Mechanics and Design
- Material, Manufacturing, and Industrial Engineering
- Fluid Mechanics and Thermal Science

GATE 2024 Syllabus ECE

The **GATE syllabus for ECE** comprises topics like Diode circuits, P-N junction, Maxwell's equations, etc. This discipline has 8 major topics, and the weightage of each chapter varies depending on the exam pattern. Check out all the important sections in the GATE ECE syllabus:

GATE Syllabus 2024 for ECE

Engineering Mathematics Networks, Signals, and Systems
Electronic Devices Control System
Electromagnetics Analog Circuits
Communication Digital Circuits

GATE 2024 Syllabus For Civil Engineering

There are various important topics in the Civil Engineering syllabus for GATE, like Solid Mechanics, Foundation Engineering, Soil Mechanics, etc. Check out all sections in the CE syllabus for GATE provided below:

- Engineering Mathematics
- Structural Engineering
- Geotechnical Engineering
- Water Resources Engineering
- Environmental Engineering
- Transportation Engineering
- Geomatics Engineering

GATE 2024 Syllabus For Electrical Engineering

Topics like Coulomb's Law, DC machines, Bode plots, etc., are some important topics of the GATE syllabus for Electrical Engineering. We have listed all the major sections of the GATE 2024 syllabus for EE below:

GATE Syllabus EE

Engineering Mathematics	Electrical Circuits
Electromagnetic Fields	Power Electronics
Signals and Systems	Electrical Machines
Power Systems	Electrical and Electronic Measurements
Analog and Digital Electronics	Control Systems

GATE Syllabus 2024 For Chemical Engineering

The GATE Chemical Engineering syllabus contains various important topics such as Heat Transfer, Chemical Reaction, Mass Transfer, and more. The questions in the exam were directly from the topics covered in the prescribed syllabus. All the important sections in the GATE 2024 syllabus for Chemical Engineering are provided below:

- Engineering Mathematics
- Process Calculations and Thermodynamics
- Fluid Mechanics and Mechanical Operations
- Heat Transfer
- Mass Transfer
- Chemical Reaction Engineering
- Instrumentation and Process Control
- Plant Design and Economics
- Chemical Technology

GATE Aptitude Syllabus

The [GATE General Aptitude syllabus](#) has Verbal Aptitude, Quantitative Aptitude, Analytical Aptitude, and Spatial Aptitude as the main sections of the syllabus. General Aptitude is a common subject for all branches. The weightage of the GATE exam syllabus for Aptitude is 15%.

GATE Syllabus 2024 For Various Subjects

There are 22 other disciplines in the GATE exam. We have explained the complete GATE syllabus for each in the coming sections. Check out the important topics covered in the GATE syllabus 2024 for the various disciplines:

GATE Syllabus For Biomedical Engineering

In the GATE syllabus for Biomedical Engineering, candidates must prepare topics like V-I relationships of the resistor, Bode plot, Transfer function, MOSFET Characteristics, MUX/DEMUX, and a lot more. Each chapter mentioned in the syllabus is important concerning the upcoming exam.

Check out the important topics covered in the GATE Biomedical Engineering syllabus:

GATE Biomedical Engineering Syllabus

Engineering Mathematics	Electrical Circuits
Signals and Systems	Analog and Digital Electronics
Measurement and Digital Electronics	Sensors and Bio instrumentations
Medical Imaging System	Biomaterials
Human Anatomy	Physiology Biomechanics

GATE Syllabus 2024 For Aerospace Engineering

Topics like Basic Fluid Mechanics, Airy's stress function, Turbomachinery, etc., are essential for the Aerospace Engineering syllabus for GATE. Check out the sections covered in the Aerospace Engineering Syllabus:

GATE Aerospace Engineering Syllabus 2024

Fourier Series	Decoupling of longitudinal and lateral-directional dynamics
Laplace Transforms	In-plane and out-of-plane
Elementary ideas of viscous flows, including boundary layers	Wind Tunnel Testing
Airy's stress function	Numerical methods for linear and nonlinear algebraic equations
Equilibrium and compatibility equations	Numerical integration and differentiation.
Theory of elasticity	Vibration of beams

Aerodynamic forces and moments,
stability control derivatives

Euler angle

Equations of motion

Dynamic stability

Measurement and visualization techniques

Orbit transfer

Longitudinal modes; lateral-directional
modes

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GATE Syllabus For Agriculture Engineering

The GATE Agriculture Engineering syllabus carries 7 major sections. Engineering Mathematics is the common section and carries 13% of the exam weightage for this discipline. Apart from General Aptitude, the rest of the exam paper will carry questions from Farm Machinery, Farm Power, Soil and Water Conservation Engineering, Irrigation and Drainage Engineering, Agricultural Processing Engineering, and Dairy and Food Engineering sections. These are the important sections of the GATE syllabus for Agriculture Engineering and will further various sub-sections individually.

GATE Syllabus 2024 For Architecture Planning

The GATE Syllabus 2024 for Architecture Planning is divided into Part A and Part B. For the candidates, Part A is mandatory. Part B is further divided into two parts, among which candidates must select one. Here we have mentioned a complete list of the topics covered in the Architecture Planning Syllabus.

- Architecture and Design
- Building Materials, Construction, and Management
- Building and Structures
- Environmental Planning and Design
- Urban Design
- Urban Planning and Housing
- Planning Techniques and Management
- Services, Infrastructure, and Transportation

GATE Biotechnology Syllabus

GATE Syllabus for Biotechnology carries Engineering Mathematics, General Biotechnology, Recombinant DNA Technology, Plant and Animal Biotechnology, and Bioprocess Engineering and Process Biotechnology as the main sections.

GATE Syllabus 2024 For Geology and Geophysics

The GATE syllabus for Geology and Geophysics contains three major sections: Common Section, Part A - Geology, and Part B - Geophysics. The Common section of the GATE exam syllabus of Geology and Geophysics has various important topics like the Earth and planetary system, the Structure and composition of the Earth, minerals,

the concept of isostasy, Structure and thickness, crust - composition, and Elements of hydrogeology and much more.

GATE syllabus for Geology and Geophysics

Part A: Geology

Geomorphology

Structural geology

Crystallography and mineralogy

Geochemistry

Igneous petrology

Sedimentology

Metamorphic petrology

Paleobiology

Stratigraphy

Resource geology

Global tectonics

Applied geology Hydrogeology

Basic principles of remote sensing Geophysical Inversion

Part B: Geophysics Syllabus

Solid-Earth Geophysics

Geodesy

Earthquake Seismology

Potential and Time-Varying Fields

Gravity Methods

Magnetic Methods

Electrical Methods

Electromagnetic Methods

Seismic methods

Geophysical signal processing

Geophysical Well Logging

Radioactive Methods

GATE Syllabus For Environmental Science Engineering

The GATE syllabus for Environmental Science Engineering carries various high-weightage topics such as Microbial metabolism, characteristics of diverse groups of microorganisms, Stereoisomerism in biomolecules, Structure, properties, water distribution, and more. We have provided a list of major topics included in the Environmental Science Engineering GATE Syllabus:

- Environmental Management and Sustainable Development
- Environmental Chemistry
- Environmental Microbiology
- Air and Noise Pollution
- Solid and Hazardous Waste Management
- Global and Regional Environmental Issues
- Water Resources and Environmental Hydraulics

- Water Wastewater Treatment and Management

GATE Syllabus 2024 For Instrumentation Engineering

The GATE syllabus for Instrumentation Engineering carries 8 major topics. Some topics covered in the GATE IN syllabus, such as Voltage and current sources, Gauss's Law, Kirchoff's laws, etc. Check out the sections covered in the Instrumentation Engineering GATE Syllabus listed below:

- Engineering Mathematics
- Electrical Circuits
- Control Systems
- Measurements
- Sensors and Industrial Instrumentation
- Analog and Digital Electronics
- Signals and Systems
- Communication and Optical Instrumentation

GATE Syllabus 2024 For Mathematics

The GATE syllabus 2024 for Mathematics (MA) comprises topics divided into chapters. The chapter-wise distribution of these topics is as given, and these topics further have subtopics under them. The weightage of different topics in the GATE syllabus for Mathematics varies based on the exam pattern.

GATE Syllabus for Mathematics

Calculus	Functional Analysis
Numerical Analysis	Linear Algebra
Partial Differential Equations	Topology
Rear Analysis	Algebra
Complex Analysis	Ordinary Differential Equations
Linear Programming	--

GATE Syllabus For Ecology and Evolution

The sections covered in the GATE syllabus for Ecology and Evolution are Ecology, Evolution, Mathematics and Quantitative Ecology, and Behavioural Ecology.

GATE Syllabus 2024 For Mining Engineering

MN is the code of Mining Engineering for the GATE exam. The topics covered in the GATE syllabus of this discipline are Engineering Mathematics, Geomechanics and Ground Control, Mine Development Surveying, Mining Methods and Machinery, Surface Environment, Mine Ventilation, Underground Hazards, Mine Economics, Mine Planning, and System Engineering.

GATE Physics Syllabus

Hamilton's formalisms, Poynting vector, Uncertainty principle, etc., are important topics covered in the GATE syllabus for Physics. A list of all the major sections covered in the PH syllabus is shown below:

- Mathematical Physics
- Nuclear and Particle Physics
- Classical Mechanics
- Electromagnetic Theory
- Atomic and Molecular Physics
- Solid State Physics and Electronics
- Quantum Mechanics
- Thermodynamics and Statistical Physics

GATE Syllabus For Metallurgical Engineering

The GATE 2024 syllabus for Metallurgical Engineering carries 6 major topics, which are further divided into chapters for the students to cover. There are various important topics covered in this subject of the GATE syllabus, such as Laws of thermodynamics, Mass transfer: Diffusion and Fick's laws, mass transfer coefficients, Dimensional analysis, Mineral Processing and Extractive Metallurgy, Physical Metallurgy, and a lot more.

GATE Syllabus 2024 For Production and Industrial Engineering

The GATE syllabus for Production and Industrial Engineering includes Engineering Mathematics, General Engineering, Manufacturing Processes, Quality and Reliability, Industrial Engineering, and Operation Research and Operational Management.

GATE Syllabus For Engineering Sciences (XE)

Engineering Mathematics is the first section of the XE paper and is compulsory for all XE candidates. This section carries the following topics in its GATE exam syllabus for XE.

- Linear Algebra
- Calculus
- Vector Calculus
- Ordinary Differential Equations
- Partial Differential Equations
- Complex variables
- Probability and Statistics
- Numerical Methods

The next section of the XE paper is decided by the candidates, who have to select two of the following sections for the GATE exam.

XE Paper Sections

XE-B (Fluid Mechanism
GATE Syllabus)

XE-C (GATE Material
Sciences Syllabus)

XE-D(Solid Mechanics GATE
Syllabus)

XE-E (Thermodynamics
GATE Syllabus)

XE-F (Polymer Science and
Engineering)

GATE Syllabus

Flow and Fluid Properties, Differential Analysis, Inviscid flow, Internal flow, Kinematics, Integral analysis, Dimensional analysis, Prandtl boundary layer equations
Structure and Imperfections

Thermodynamics and Kinetics

Properties of Materials

Processing of Materials

Characterization Techniques

Material types

Elements of Quantum Mechanics and Mathematics

Environmental Degradation
Flexural and shear stresses,

Uniform torsion

Bending moment and shear force in statically determinate beams

Transformation of stress

Simple stress and strain relationships

Simple bending theory

Buckling of the column, combined and direct bending stresses

Basic Concepts

Thermodynamics Relations, and

Ideal Gas Mixtures

Law of Thermodynamics

Thermodynamics Cycle

Chemistry of high polymers

Polymer processing

Polymer blends and composites

Polymer Technology

Polymer rheology

Synthesis and properties

Polymer testing

Polymer Characterization

Food Chemistry and Nutrition

XE-G (Food Technology)

Food Products Technology

Food Microbiology, and

Food Engineering

Atmospheric Sciences GATE Syllabus

Fundamental of Meteorology

Atmospheric Thermodynamics

Observation Techniques of the Atmospheric Properties

Fundamental equations

XE-H(Atmospheric and
Oceanic Sciences GATE
Syllabus)

Tropical Meteorology

Hydrostatic equilibrium

Atmospheric Electricity

Cloud Physics

Primitive equations of Numerical Weather Prediction

Synoptic weather forecasting

General Circulation and Climate Modelling

Ocean Science GATE Syllabus

Seawater Properties

T-S diagrams

Coastal processes and Estuary Dynamics

Coastal zone management

Wind-Driven Circulation

Ocean Observations

Ocean Tide and Waves and their properties

Global conveyor belt circulation

Momentum equation, mass conservation, Vorticity

Subtropical gyres

Current System in the Indian Ocean

Ocean and Wave Modeling, Ocean State Forecasting

Seawater

Marine Pollution

Data Assimilation

Ocean Turbulence

Primary and secondary production

GATE Syllabus 2024 For Humanities Social Science (XH)

Reasoning and Comprehension is the compulsory section of the GATE XH Syllabus. The major chapters covered in the GATE exam syllabus of the XH-B1 are Reading, Comprehension, Expression, Analytical reasoning, and Logical reasoning.

The next section of the XH paper will be any of the given sections shown in the table below. The syllabus for GATE for each topic is provided against each of them.

XH Paper Sections**GATE Syllabus 2024**

Statistics

Econometrics and Mathematical Economics

Microeconomics

XH-C1 (Economics
GATE Syllabus)

Macroeconomics

International Economics

Public Economics

Development Economics

Indian Economy

Multi-genre literature in English

Literature from India and, extending to some degree, the
larger Indian subcontinentXH-C2(GATE English
Syllabus)

Literary criticism and theory

Research approaches and methodologies

History of English literature and English literary studies

Critical and cultural intellectual traditions and approaches are
widely referred to and used in the discipline of English

Areal Typology, Universals, Cross-linguistic Features

Historical Linguistics

Sociolinguistics

XH-C3 (GATE
Linguistics Syllabus)

Methods of analysis

Language and Linguistics

Levels of Grammar and Grammatical Analysis

Applied Linguistics

XH-C4(Philosophy
GATE Syllabus)

Classical Indian Philosophy

Contemporary Western Philosophy
Contemporary Indian Philosophy
Classical and Modern Western Philosophy
Perception, Learning, Memory, and Forgetting
The biological and evolutionary basis of behavior
Personality
Development across the lifespan
Applications of Psychology
Motivation, Emotion, Stress, and Coping
Cognition: Thinking, Intelligence, and Language
Research Methods and Statistics
Psychometrics
Social psychology
Research Methodology and Methods,
Indian Society / Sociology of India,
Social Movements, and
Sociological Concepts,
Agrarian Sociology and Rural Transformation,
Family, Marriage, and Kinship,
Sociological Theory,
Sociology of Development.

XH-C5 (Psychology
GATE Syllabus)

XH-C6 (Sociology
GATE Syllabus)

GATE Syllabus For Life Science (XL)

The compulsory section of the GATE XL syllabus is Chemistry. This section carries Structure and Bonding, Atomic Structure and Periodicity, Chemistry of Biomolecules, s, p and d Block Elements, Chemical Equilibria, Electrochemistry, Reaction Kinetics,

Thermodynamics, and Structure-Reactivity Correlations and Organic Reaction Mechanisms.

The next section of the XL paper will be decided by the candidates, who have to select two papers from the given list. The GATE syllabus 2024 for each optional paper is provided against them.

XL Paper Sections GATE Syllabus

Biochemical Separation Techniques

Immune System

Organization of life, folding and function, and protein structure.

Photosynthesis, Enzyme kinetics include its regulation and inhibition, Metabolism of Nitrogen-containing compounds, Metabolic pathways and their regulation, Vitamins, and Coenzymes.

XH-Q (Biochemistry
GATE Syllabus)

Signal transduction

Cell structure and organelles; Biological membranes;

Hormones and neurotransmitters

DNA replication, transcription, and translation; Biochemical regulation of gene expression;

Transport across membranes

Recombinant DNA technology and applications.

Plant Anatomy

Plant Systematics

Physiology and Biochemistry

XL-R (Botany GATE
Syllabus)

Morphogenesis & Development

Plant Breeding and Genetic Modification

Plant Pathology

	Economic Botany
	Ecology and Environment
	Methods in Microbiology
	Historical Perspective
	Prokaryotic and Eukaryotic Cells: Structure and Function
	Microbial Growth
	Microbial Taxonomy and Diversity
XL-S (Microbiology GATE Syllabus)	Control of Microorganisms
	Chemotherapy/Antibiotics
	Microbial Genetics
	Microbial Metabolism
	Microbial Diseases and Host-Pathogen Interaction
	Microbial Ecology
	Genetics
	Evolution
	Ecology
	Animal Behavior
	Animal world
XL-T (Zoology GATE Syllabus)	Biochemistry and Molecular Biology
	Animal Anatomy and Physiology
	Parasitology and Immunology
	Development Biology
	Cell Biology
	Gene expression in Eukaryotes

	Food Products Technology
XL-U (Food Technology GATE Syllabus)	Food Engineering
	Food Chemistry and Nutrition
	Food Microbiology

Difference Between GATE Syllabus and IES Syllabus

IISc and 7 IITs conduct the GATE Exam, and the syllabus covers only the topics required for higher studies. In contrast, the UPSC conducts the [IES Exam](#) covering the complete Engineering syllabus and a few additional topics. Although there are various topics common for both exams, the difficulty level in the GATE exam syllabus differs from the topics in the IES syllabus. Let us see some important differences between the GATE syllabus and the IES syllabus in the table provided below:

Difference Between GATE Syllabus and IES Syllabus

GATE Exam Syllabus

GATE syllabus tests your problem-solving capability.

It is conducted for 29 branches.

The syllabus of the GATE technical section is divided into 8 subjects.

The GATE exam syllabus includes part of the Engineering Graduate Syllabus and Numerical and Verbal Ability.

IES Exam Syllabus

The IES Exam syllabus tests your conceptual capability.

It is conducted for only 4 branches of Engineering.

The [IES Exam Syllabus](#) of the technical section is divided into 12 subjects.

The syllabus includes a maximum of Engineering Graduate Syllabus and GS and Engineering Aptitude.

Preparation Tips for GATE Syllabus 2024

The immense pressure and growing competition make the GATE syllabus challenging for candidates to prepare for the exam. It is a well-known fact that we all learn from the experiences of others. Hence, we are providing the preparation tips acquired by Toppers to cover and prepare the GATE syllabus effectively to crack the 2024 exam:

- Understand the section-wise basics of the GATE Syllabus 2024.
- Know the weightage and marks of each topic.
- A study from the right resources and appropriate books according to the syllabus.
- Revise regularly and try to solve tough questions included in the syllabus of the GATE 2024 exam.
- Solve previous years' [GATE Question Papers](#).

Subject-wise Weightage of GATE Syllabus 2024

The GATE syllabus for every 29 disciplines carries a fixed subject-wise weightage for the exam. The complete description of the weightage of the syllabus for GATE is given in the table provided below:

Sections	Marks
General Aptitude	15 Marks (10 Questions)
Respective Selected Subject	85 Marks (55 Questions)

