

GATE Syllabus

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 syllabus 2023 will help candidates plan their preparation strategy effectively. There are 29 disciplines where the syllabus is considered an important step to prepare.

We have provided a complete list of all disciplines and their GATE syllabus pdf for candidates to download and prepare effectively. We have also provided a brief description of the branch-wise GATE syllabus 2023 to have a quick idea about the important topics that are required to be focused on priority.

Topic-wise GATE Syllabus

The topic-wise breakdown of the GATE syllabus is an important aspect of effective exam preparation. Knowing the topics covered in the exam's respective 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 syllabus.

GATE CSE Syllabus 2023

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 GATE CSE syllabus 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 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 GATE Civil Engineering syllabus provided below:

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

GATE Syllabus For Mechanical Engineering

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:

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

GATE 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 EE syllabus below:

GATE Electrical Engineering Syllabus

Engineering Mathematics

Electromagnetic Fields

Signals and Systems

Power Systems

Analog and Digital Electronics

Electrical Circuits

Power Electronics

Electrical Machines

Electrical and Electronic Measurements

Control Systems

GATE Syllabus 2023 For 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 upon the exam pattern. Check out all important sections in the GATE ECE syllabus:

GATE Syllabus 2023 for ECE

Engineering Mathematics

Electronic Devices

Electromagnetics

Communication

Networks, Signals, and Systems

Control System

Analog Circuits

Digital Circuits

[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 Aptitude syllabus in the GATE exam is 15%.

[GATE Syllabus 2023 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 Chemical Engineering syllabus 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 Syllabus 2023 For Other 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 2023 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

Signals and Systems

Measurement and Digital Electronics

Medical Imaging System

Human Anatomy

Electrical Circuits

Analog and Digital Electronics

Sensors and Bio instrumentations

Biomaterials

Physiology Biomechanics

GATE Syllabus 2023 For Aerospace Engineering

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

GATE Aerospace Engineering Syllabus 2023

Fourier Series

Laplace Transforms

Elementary ideas of viscous flows, including boundary layers

Airy's stress function

Equilibrium and compatibility equations

Theory of elasticity

Aerodynamic forces and moments, stability control derivatives

Euler angle

Equations of motion

Dynamic stability

Decoupling of longitudinal and lateral-directional dynamics

In-plane and out-of-plane

Wind Tunnel Testing

Numerical methods for linear and nonlinear algebraic equations

Numerical integration and differentiation.

Vibration of beams

Measurement and visualization techniques

Orbit transfer

Longitudinal modes; lateral-directional modes

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 as well. 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 2023 For Architecture Planning

The GATE Syllabus 2023 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 2023 For Geology and Geophysics

The GATE syllabus for Geology and Geophysics carries three major sections which are: Common Section, Part A - Geology, and Part B - Geophysics. The Common section of the GATE Geology and Geophysics syllabus has various important topics like Earth and planetary system, 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

Part B: Geophysics Syllabus

Solid-Earth Geophysics

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

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
Geophysical Inversion

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 2023 For Instrumentation Engineering

The GATE syllabus for Instrumentation Engineering carries 8 major 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 2023 For Mathematics

The GATE syllabus 2023 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

Numerical Analysis

Partial Differential Equations

Rear Analysis

Complex Analysis

Linear Programming

Functional Analysis

Linear Algebra

Topology

Algebra

Ordinary Differential Equations

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 2023 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 some 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 2023 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 2023 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 syllabus 2023 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 any two of the following given sections for the GATE exam.

| XE Paper Sections | GATE Syllabus |
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| XE-B (Fluid Mechanism GATE Syllabus) | Flow and Fluid Properties, Differential Analysis, Inviscid flow, Internal flow, Kinematics, Integral analysis, Dimensional analysis, Prandtl boundary layer equations |

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| <p>XE-C (GATE Material Sciences Syllabus)</p> | <p>Structure and Imperfections Thermodynamics and Kinetics Properties of Materials Processing of Materials Characterization Techniques Material types Elements of Quantum Mechanics and Mathematics Environmental Degradation</p> |
| <p>XE-D(Solid Mechanics GATE Syllabus)</p> | <p>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</p> |
| <p>XE-E (Thermodynamics GATE Syllabus)</p> | <p>Basic Concepts Thermodynamics Relations, and Ideal Gas Mixtures Law of Thermodynamics Thermodynamics Cycle</p> |
| <p>XE-F (Polymer Science and Engineering)</p> | <p>Chemistry of high polymers Polymer processing Polymer blends and composites Polymer Technology Polymer rheology Synthesis and properties Polymer testing Polymer Characterization</p> |
| <p>XE-G (Food Technology)</p> | <p>Food Chemistry and Nutrition Food Products Technology Food Microbiology, and Food Engineering</p> |
| <p>XE-H(Atmospheric and Oceanic Sciences GATE Syllabus)</p> | <p>Atmospheric Sciences GATE Syllabus Fundamental of Meteorology Atmospheric Thermodynamics Observation Techniques of the Atmospheric Properties Fundamental equations 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</p> |

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| | 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 |
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GATE Syllabus 2023 For Humanities Social Science (XH)

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

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

| XH Paper Sections | GATE Syllabus |
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| XH-C1 (Economics GATE Syllabus) | Statistics Econometrics and Mathematical Economics Microeconomics Macroeconomics International Economics Public Economics Development Economics Indian Economy |
| XH-C2(GATE English Syllabus) | Multi-genre literature in English Literature from India and, extending to some degree, the larger Indian subcontinent 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 |

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| XH-C3 (GATE Linguistics Syllabus) | Areal Typology, Universals, Cross-linguistic Features Historical Linguistics Sociolinguistics 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 |
| XH-C5 (Psychology GATE Syllabus) | Perception, Learning, Memory, and Forgetting The biological and evolutionary basis of behaviour Personality Development across the lifespan Applications of Psychology Motivation, Emotion, and Stress and Coping Cognition: Thinking, Intelligence, and Language Research Methods and Statistics Psychometrics Social psychology |
| XH-C6 (Sociology GATE Syllabus) | 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. |

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 any two papers from the given list. The GATE syllabus for each optional paper is provided against them.

| XL Paper Sections | GATE Syllabus |
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| <p>XH-Q (Biochemistry GATE Syllabus)</p> | <p>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. 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.</p> |
| <p>XL-R (Botany GATE Syllabus)</p> | <p>Plant Anatomy Plant Systematics Physiology and Biochemistry Genetics Morphogenesis & Development Plant Breeding and Genetic Modification Plant Pathology Economic Botany Ecology and Environment</p> |
| <p>XL-S (Microbiology GATE Syllabus)</p> | <p>Methods in Microbiology Historical Perspective Prokaryotic and Eukaryotic Cells: Structure and Function Microbial Growth Microbial Taxonomy and Diversity Control of Microorganisms Chemotherapy/Antibiotics Microbial Genetics Microbial Metabolism Microbial Diseases and Host-Pathogen Interaction Microbial Ecology</p> |
| <p>XL-T (Zoology GATE Syllabus)</p> | <p>Genetics Evolution Ecology Animal Behavior Animal world Biochemistry and Molecular Biology Animal Anatomy and Physiology Parasitology and Immunology Development Biology Cell Biology Gene expression in Eukaryotes</p> |

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