Title: GATE 2024 Syllabus: Download Latest GATE Syllabus PDF

Description: Get ready for GATE 2024 with ease! Download the latest GATE 2024 syllabus PDF to access the detailed subject-wise curriculum. Your key to success in the GATE Exam begins with the GATE 2024 syllabus.

Heading 2: GATE Syllabus 2024 (CSE, ECE, Electrical, Mechanical)

GATE 2024 Syllabus - The GATE Exam Syllabus 2024 is important since it gives students an understanding of the primary topics and concepts covered for the 2024 GATE exam. Qualifying GATE Exam 2024 is crucial for the students who wish to seek admission or financial assistance to Postgraduate Programs in Engineering. Therefore, knowing the GATE 2024 Syllabus will help the students to plan their studies accordingly and gain a good GATE 2024 scorecard. Candidates are advised to read the GATE 2024 Notification before filling the online Application form for GATE exam.

For student's convenience, we have compiled the **GATE 2024 Exam Syllabus for all Subjects**. So, keep scrolling and begin preparing for your subject.

GATE 2024 Syllabus PDF Subject-Wise

The PDF for the detailed subject-wise syllabus of GATE 2024 can be accessed from the institute conducting GATE 2024.

PAPER	CODE	Link

Aerospace Engineering	AE	
Agricultural Engineering	AG	
Architecture and Planning	AR	
Biotechnology	BT	
Bio - medical Engineering	BM	
Civil Engineering	CE	
Chemical Engineering	CH	
Computer Science & Information Technology	CS	
Chemistry	CY	
Electronics and Communication Engineering	EC	
Electrical Engineering	EE	
Engineering Sciences	XE	
Petroleum Engineering	PE	
Geomatics Engineering	GE	
Geology and Geophysics	GG	
Instrumentation Engineering	IN	
Life Sciences	XL	
Mathematics	MA	
Mechanical Engineering	ME	
Mining Engineering	MN	

Metallurgical Engineering	MT	
Naval Architecture & Marine Engineering	NM	
Physics	PH	
Production and Industrial Engineering	PI	
Textile Engineering & Fibre Science	TF	
Ecology and Evolution	EY	
Statistics	ST	
Environmental Science and Engineering	ES	
Humanities and Social Sciences	XH	
Data Science & Artificial Intelligence (NEW)	DA	

GATE Syllabus 2024 for General Aptitude

GATE Aptitude Syllabus is designed to check the ability of candidates to comprehend and command over English language, basic numerical skills, and logical reasoning skills. GATE Aptitude is a common subject for all testpapers. Questions in the General Aptitude Section will be asked from the following four sections.

- Verbal Aptitude
- Analytical Aptitude
- Spatial Aptitude
- Numerical Aptitude

GATE 2024 Verbal Aptitude Syllabus

Tenses	Adjectives

Articles	Words and Phrases
Vocabulary	Parts of speech
Idioms	Prepositions
Conjunctions	Verb-noun agreement
Comprehension & reading	Narrative sequencing
Sentence completion	Verbal analogies
Critical reasoning	Word groups

GATE 2024 Analytical Aptitude Syllabus

- Logic– Induction & Deduction
- Analogy
- Number relations & reasoning

GATE 2024 Spatial Aptitude Syllabus

Mirroring	Assembling
Rotation	Scaling
Translation	Paper folding & 2-D and 3-D patterns
Grouping	Papercutting

GATE 2024 Numerical Aptitude Syllabus

Elementary statistics & probability	Geometry
Data- Graphs (bar graph, histogram, pie chart, and other data graphs), 2- and 3-dimensional plots, Maps, and Tables	Data interpretation
Numerical reasoning	Numerical computation & estimation- ● Powers ● Series ● Exponents ● Percentages ● Permutations and Combinations ● Ratios ● Logarithms
Mensuration	

GATE Syllabus 2024 for CSE (Computer Science) - Topic-Wise Weightage

- GATE Syllabus for CSE is divided into three sections- General Aptitude, Engineering Mathematics and Core Discipline.
- The General Aptitude section carries 15 marks, Engineering Mathematics about 13 marks and 72 marks for the topics from Core Discipline.

Topic	Sub-Topics
Discrete Mathematics	Propositional and first order logic. Sets, relations, functions, partial orders and lattices. Monoids, Groups. Graphs: connectivity, matching, coloring. Combinatorics: counting, recurrence relations, generating functions

Digital Logic	Boolean algebra. Combinational and sequential circuits. Minimization. Number representations and computer arithmetic (fixed and floating-point)
Computer Organization and Architecture	Machine instructions and addressing modes. ALU, data-path and control unit. Instruction pipelining, pipeline hazards. Memory hierarchy: cache, main memory and secondary storage; I/O interface (interrupt and DMA mode)
Programming and Data Structures	Programming in C. Recursion. Arrays, stacks, queues, linked lists, trees, binary search trees, binary heaps, graphs
Algorithms	Searching, sorting, hashing. Asymptotic worst-case time and space complexity. Algorithm design techniques: greedy, dynamic programming and divide-and-conquer. Graph traversals, minimum spanning trees, shortest paths
Theory of Computation	Regular expressions and finite automata. Context-free grammars and push-down automata. Regular and contex-free languages, pumping lemma. Turing machines and undecidability.
Compiler Design	Lexical analysis, parsing, syntax-directed translation. Runtime environments. Intermediate code generation. Local optimization, Data flow analyses: constant propagation, liveness analysis, common subexpression elimination
Operating System	System calls, processes, threads, inter-process communication, concurrency and synchronization. Deadlock. CPU and I/O scheduling. Memory management and virtual memory. File systems
Databases	ER-model. Relational model: relational algebra, tuple calculus, SQL. Integrity constraints, normal forms. File organization, indexing (e.g., B and B+ trees). Transactions and concurrency control

Computer Networks	Concept of layering: OSI and TCP/IP Protocol Stacks; Basics of packet, circuit and virtual circuit-switching; Data link layer: framing, error detection, Medium Access Control, Ethernet bridging; Routing protocols: shortest path, flooding, distance vector and link-state routing; Fragmentation and IP addressing, IPv4, CIDR notation, Basics of IP support protocols (ARP, DHCP, ICMP), Network Address Translation (NAT); Transport layer: flow control and congestion control, UDP, TCP, sockets; Application layer protocols: DNS, SMTP, HTTP, FTP, Email

The table below shows the weightage of important topics from last year's GATE CSE Syllabus for last year. Candidates can refer to the table below to know the expected number of questions from each topic:

Topics	Year-wise Weightage of Important Topics (Marks)						
	GATE 2024 (Expected)	GATE 2021	GATE 2020	GATE 2019	GATE 2018	GATE 2017	GATE 2016
General Aptitude	15	15	15	15	15	15	15
Engineering Mathematics	13	6	5	6	7	8	10
Discrete Mathematics		11	10	7	12	7	4
Digital Logic	6	5	4	9	4	5	5

Computer Organization and Architecture	8	6	11	3	11	9	7
Programming and Data Structures	15	8	12	12	10	14	11
Algorithms	7	12	6	7	7	6	11
Theory of Computation	6	8	9	7	7	9	9
Compiler Design	4	8	4	6	6	4	4
Operating System	9	5	10	10	10	10	10
Databases	7	8	8	8	4	6	5
Computer Networks	10	8	6	10	7	7	9

GATE Syllabus 2024 for Mechanical Engineering - Topic Wise Weightage

GATE Syllabus for Mechanical Engineering (ME) is majorly divided into five sections with several sub-topics under each section:

- General Aptitude
- Engineering Mathematics
- Applied Mechanics and Design

- Fluid Mechanics and Thermal Sciences
- Materials, Manufacturing and Industrial Engineering.

General Aptitude section carries a weightage of 15 marks, Engineering Mathematics for 13 marks while the rest for other topics from the syllabus.

Candidates can check the previous year weightage of important topics from GATE Syllabus for ME for better preparation strategy.

Topics	Year-wise Weightage of Important Topics (Marks)										
	GATE 2024 (Expected)	GATE 2021		GATE 2020		GATE 2019		GATE 2018		GATE 2017	
	--	Slot 1	Slot 2	Slot 1	Slot 2	Slot 1	Slot 2	Slot 1	Slot 2	Slot 1	Slot 2
General Aptitude	14-15	15	15	15	15	15	15	15	15	15	15
Engineering Mathematics	15	13	16	12	13	13	13	13	13	13	14
Applied Mechanics and Design											
Engineering Mechanics	2-3	0	4	3	4	5	3	5	3	4	0

Subject	Range										
Mechanics of Materials/ Strength of Materials	9-10	9	5	9	9	9	9	9	9	12	8
Theory of Machines	9-10	8	6	7	7	8	12	10	8	4	11
Vibrations		6	2	3	1	3	2	3	0	3	3
Machine Design	4-5	3	4	3	2	5	1	0	3	4	5
Fluid Mechanics and Thermal Sciences											
Fluid Mechanics	6-7	4	9	7	8	5	6	10	7	9	8
Heat-Transfer	5-6	4	3	3	5	8	7	2	3	5	6
Thermodynamics	12-13	9	7	4	5	4	5	5	4	4	7
Applications		5	7	9	9	6	5	4	9	7	4
Materials, Manufacturing and Industrial Engineering											
Engineering Materials	1-2	0	1	2	1	0	3	1	1	0	2

Casting, Forming and Joining Processes; Machining and Machine Tool Operations; Metrology and Inspection; Production Planning and Control	14-15	16	16	14	15	14	15	18	19	16	10
Industrial Engineering; Operations Research; Computer Integrated Manufacturing	7-8	8	5	9	6	5	4	5	6	4	7

GATE Syllabus 2024 for Electrical Engineering - Topic-Wise Weightage

GATE Syllabus for Electrical Engineering is divided into 11 sections with various topics under each section:
- General Aptitude
- Engineering Mathematics

- Electric Circuits
- Electromagnetic Fields
- Signals and Systems
- Electrical Machines
- Power Systems
- Control Systems
- Electrical and Electronic Measurements
- Analog and Digital Electronics
- Power Electronics

The General Aptitude section from GATE Syllabus for EE carries 15 marks weightage while the rest topics cover 85 marks.

Candidates can check the previous year topic-wise weightage of GATE Syllabus for EE. This will help candidates know the section that have the highest marks weightage in the exam:

Topics	Year-wise Weightage of Important Topics (Marks)					
	GATE 2024 (Expected)	GATE 2021	GATE 2020	GATE 2019	GATE 2018	GATE 2017
General Aptitude	15	15	15	15	15	15
Engineering Mathematics	12-13	12	12	14	11	12
Electric Circuits: Network elements	9-10	11	8	11	8	9
Electromagnetic Fields	4-5	6	6	1	2	4
Signals and Systems	8-9	8	10	4	10	7
Electrical Machines	11-12	8	10	13	8	13

Power Systems	10-12	12	8	10	10	8
Control Systems	8-9	8	10	9	8	11
Electrical and Electronic Measurements	2-3	2	2	3	4	4
Analog and Digital Electronics	8-9	9	11	10	14	9
Power Electronics	8-9	9	8	10	10	8

GATE Syllabus 2024 for Instrumentation Engineering (Topic Wise Weightage)

GATE IN Topics	Sub-Topics Covered	Number of Questions	Weightage
General Aptitude	--	10	15%
Engineering Mathematics	Complex variable Probability density, limit, Determinant function	7	11%
Network Theory	--	3	4%

Digital Circuits	ATOD or D/A converter, flash type ADC, multiplexer	5	8%
Signals and Systems	Laplace transformer, Basic properties of signal	5	8%
Control Systems	Time response Analysis	4	6%
Measurements	AC, bridge	8	12%
Analog Circuits	Application of op-amp amplifier	5	8%
Communication	--	2	3%
Transducers	Pressure measurement, temperature measurement, resistive, capacitive and inductive transducer	5	8%
Optical Instrumentation	Laser, optical fiber, interferometer	3	5%
Process Control	PID controller	1	1%

GATE Syllabus 2024 for Civil Engineering - Topic-Wise Weightage

GATE Syllabus for Civil Engineering is divided into eight sections with several topics and sub-topics under each section:

- General Aptitude
- Engineering Mathematics
- Structural Engineering

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

Topics	Year-wise Weightage of Important Topics (Marks)					
	GATE 2024 (Expected)	GATE 2021	GATE 2020	GATE 2019	GATE 2018	GATE 2017
General Aptitude	15	15	15	15	14	15
Engineering Mathematics	13	13	11	11	11	13
Structural Engineering						
Engineering Mechanics	2	0	1	1	3	1
Solid Mechanics/ Strength of Material	5	3	4	3	6	5
Structural Analysis	4	6	6	4	2	7
Construction Materials and Management	3	1	1	1	3	1
Concrete Structures	7	5	5	5	7	5
Steel Structures	3	3	2	5	4	2

Geotechnical Engineering						
Soil Mechanics	12	15	14	16	14	13
Foundation Engineering						
Water Resources Engineering						
Fluid Mechanics	7	8	7	9	8	8
Hydraulics						
Hydrology	4	4	5	5	5	6
Irrigation						
Environmental Engineering						
Water and Waste Water Quality and Treatment	12	11	11	9	10	11
Air Pollution						
Municipal Solid Wastes						
Transportation Engineering						

Transportation Infrastructure	8	11	11	10	9	9
Highway Pavements						
Traffic Engineering						
Geomatics Engineering						
Geomatics Engineering	5	5	7	6	4	4

GATE Syllabus 2024 for Electronics and Communication Engineering

1. Networks
2. Signals and Systems
3. Electronic Devices and Circuits
4. Analog Circuits
5. Digital Circuits
6. Control Systems
7. Communications
8. Electromagnets

GATE Syllabus 2024 For Chemical Engineering- Topic-Wise Weightage

GATE Syllabus for Civil Engineering is divided into eight sections with several topics and sub-topics under each section:

- General Aptitude
- Engineering Mathematics
- Structural Engineering

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

Topics	Year-wise Weightage of Important Topics (Marks)					
	GATE 2024 (Expected)	GATE 2021	GATE 2020	GATE 2019	GATE 2018	GATE 2017
General Aptitude	15	15	15	15	14	15
Engineering Mathematics	13	13	11	11	11	13
Structural Engineering						
Engineering Mechanics	2	0	1	1	3	1
Solid Mechanics/ Strength of Material	5	3	4	3	6	5
Structural Analysis	4	6	6	4	2	7
Construction Materials and Management	3	1	1	1	3	1
Concrete Structures	7	5	5	5	7	5

Steel Structures	3	3	2	5	4	2

Geotechnical Engineering

Soil Mechanics						
Foundation Engineering	12	15	14	16	14	13

Water Resources Engineering

Fluid Mechanics						
Hydraulics	7	8	7	9	8	8
Hydrology						
Irrigation	4	4	5	5	5	6

Environmental Engineering

Water and Waste Water Quality and Treatment						
Air Pollution	12	11	11	9	10	11
Municipal Solid Wastes						

Transportation Engineering

Transportation Infrastructure						
Highway Pavements	8	11	11	10	9	9
Traffic Engineering						
Geomatics Engineering						
Geomatics Engineering	5	5	7	6	4	4

GATE 2024 Syllabus for Architecture Planning- Topic Wise Weightage

Topic	Weightage (Marks)
Architecture & Design	20-30
Building and Structures	25-30
Urban Planning and Housing	15-20
Planning Techniques and Management	10-15

GATE Syllabus for Data Science and Artificial Intelligence

GATE 2024 Data Science and AI Syllabus is divided into two sections- (i) General Aptitude and (ii) Core Discipline carrying a weightage of 15 marks and 85 marks. The core discipline includes seven subjects, namely, Probability and Statistics, Linear Algebra, Calculus and Optimization, Programming, Data Structures and Algorithms, Database Management and Warehousing, Machine Learning and AI.

Subject	Topics
Probability and Statistics	Counting (permutation and combinations), probability axioms, Sample space, events, independent events, mutually exclusive events, marginal, conditional and joint probability, Bayes Theorem, conditional expectation and variance, mean, median, mode and standard deviation, correlation, and covariance, random variables, discrete random variables and probability mass functions, uniform, Bernoulli, binomial distribution, Continuous random variables and probability distribution function, uniform, exponential, Poisson, normal, standard normal, t-distribution, chi-squared distributions, cumulative distribution function, Conditional PDF, Central limit theorem, confidence interval, z-test, t-test, chi-squared test.
Linear Algebra	Vector space, subspaces, linear dependence and independence of vectors, matrices, projection matrix, orthogonal matrix, idempotent matrix, partition matrix and their properties, quadratic forms, systems of linear equations and solutions; Gaussian elimination, eigenvalues and eigenvectors, determinant, rank, nullity, projections, LU decomposition, singular value decomposition.
Calculus and Optimization	Functions of a single variable, limit, continuity and differentiability, Taylor series, maxima and minima, optimization involving a single variable.
Programming, Data Structures and Algorithms	Programming in Python, basic data structures: stacks, queues, linked lists, trees, hash tables; Search algorithms: linear search and binary search, basic sorting algorithms: selection sort, bubble sort and insertion sort; divide and conquer: mergesort, quicksort;

	introduction to graph theory; basic graph algorithms: traversals and shortest path.
Database Management and Warehousing	ER-model, relational model: relational algebra, tuple calculus, SQL, integrity constraints, normal form, file organization, indexing, data types, data transformation such as normalization, discretization, sampling, compression; data warehouse modelling: schema for multidimensional data models, concept hierarchies, measures: categorization and computations.
Machine Learning	(i) Supervised Learning: regression and classification problems, simple linear regression, multiple linear regression, ridge regression, logisic regression, k-nearest neighbor, naive Bayes classifier, linear discriminant analysis, support vector machine, decision trees, bias-variance trade-off, cross-validation methods such as leave-one-out (LOO) cross-validation, k-folds cross-validation, multi-layer perceptron, feed-forward neural network; (ii) Unsupervised Learning: clustering algorithms, k-means/k-medoid, hierarchical clustering, top-down, boΣom-up: single-linkage, multiple-linkage, dimensionality reduction, principal component analysis.
AI	Search: informed, uninformed, adversarial; logic, propositional, predicate; reasoning under uncertainty topics - conditional independence representation, exact inference through variable elimination, and approximate inference through sampling.

GATE Previous Year Question Papers

GATE Exam Preparation is incomplete without solving GATE PYQ's. Attempting GATE Previous Year Questions let candidates know where they stand in the GATE 2024 Exam race. It helps them analyse their weaknesses and work upon them. Solving at least two previous years' GATE Papers will help candidates in preparing well for the exam.

You can download official GATE TestPapers by clicking on this link. [GATE Previous Years' Papers](#)

GATE 2024 Syllabus FAQs

Q. Will the GATE Syllabus 2024 change?

Ans. No changes are expected in GATE Syllabus 2024. Candidates can check paper-wise detailed GATE Syllabus 2024 using the links mentioned above.

Q. How long does it take to finish GATE Syllabus 2024?
Ans. From student to student, the time required to finish the GATE course varies substantially. But on average, finishing the curriculum and being ready for the GATE takes around 8 months for a recent graduate with a completely flexible schedule, and about 12 months for a student who is still in college.

Q. What question types are asked in the GATE Exam?
Ans. GATE Question Paper 2024 will comprise of three types of questions- MCQs (Multiple Choice Questions), MSQs (Multiple Select Questions) and NATs (Numerical Answer Type).

Q. Is General Aptitude syllabus common for all papers of GATE 2024?
Ans: Yes, GATE 2024 General Aptitude Syllabus is common for all 30 GATE papers. GA section holds a weightage of 15 marks in the question paper and consists of topics such as:
- Verbal Ability
- Quantitative Aptitude
- Analytical Aptitude
- Spatial Aptitude

Q. What is the ratio of theoretical and practical questions in GATE 2024?
Ans. GATE Paper generally follows the 80-20 law. This means that 80% of the questions will be problem-based and the remaining 20% theory-based. However, this ratio might differ each year depending on the latest trend.

Conclusion

We observe that the GATE Exam has an extensive syllabus and candidates have to prepare well in order to gain a good GATE scorecard. Understanding the syllabus and GATE paper pattern on a deeper level is the first step towards clearing the exam. Additionally, refer to the recommended books for GATE 2024 and practice Mock papers for GATE Exam.