GATE 2021

Organising Institute
Indian Institute of Technology Bombay

GRADUATE APTITUDE TEST IN ENGINEERING

GATE is a national examination jointly conducted by IISc Bangalore and seven IITs (Bombay, Delhi, Guwahati, Kanpur, Kharagpur, Madras, Roorkee) under the aegis of Ministry of Education (MoE), Government of India. GATE examination is a Computer Based Test (CBT).

Qualification in GATE examination is required for admission to Postgraduate Programs (Master's and Doctoral) with Ministry of Education (MoE) and other Government Scholarships/Assistantships, subject to fulfilling the admission criteria of the admitting institute.

The GATE score is also used by some PSUs for their recruitment and by several other universities in India and abroad for their admissions.

GATE 2021 score will remain valid for **THREE YEARS** from the date of announcement of results.

ELIGIBILITY

The following candidates are eligible to appear in GATE-2021:

A candidate who is currently studying in 3rd or higher years of any undergraduate degree program OR has already completed any government approved degree program in Engineering / Technology / Architecture / Science / Commerce / Arts.

Disclaimer: GATE is NOT an admission ensuring examination. Qualifying in GATE examination does NOT guarantee admission / scholarship. Admission to any institute is fully dependent on the admitting institute's criteria for educational qualification. Similarly, GATE qualification does not assure a Public Sector Undertaking (PSU) job, as it depends on the recruitment procedure of the concerned PSU. GATE committee is NOT liable for any legal obligations related to admission / job.

GATE PAPERS

The following are the GATE-2021 subject papers:

Aerospace Engineering (AE)	Instrumentation Engineering (IN)
Agricultural Engineering (AG)	Mathematics (MA)
Architecture and Planning (AR)	Mechanical Engineering (ME)
Biomedical Engineering (BM)	Mining Engineering (MN)
Biotechnology (BT)	Metallurgical Engineering (MT)
Civil Engineering (CE)	Petroleum Engineering (PE)
Chemical Engineering (CH)	Physics (PH)
Computer Science and Information Technology (CS)	Production and Industrial Engineering (PI)
Chemistry (CY)	Statistics (ST)
Electronics and Communication Engineering (EC)	Textile Engineering and Fibre Science (TF)
Electrical Engineering (EE)	Engineering Sciences (XE)
Environmental Science and Engineering (ES)*	Humanities and Social Sciences (XH)*
Ecology and Evolution (EY)	Life Sciences (XL).
Geology and Geophysics (GG)	

***Note: ES and XH are new papers introduced in GATE-2021.**

A candidate may appear either in ONE or TWO subject papers. For candidates who choose TWO papers, the combination must be from the approved list of combinations and subject to the availability of infrastructure and date.

IMPORTANT DATES

Dates of Examination

5th,6th,7th,12th,13th & 14th February 2021

Important note: Dates mentioned may change because of COVID-19 situation.

Application Timeline

Opening date of online registration / application portal:
Monday 14th September, 2020

Closing date of REGULAR online registration / application:
Wednesday 30th September, 2020

End of EXTENDED period for online registration / application (with late fee): **Wednesday 7th October, 2020**

Announcement of Results: **Monday 22nd March, 2021**

APPLICATION FEE (PER SUBJECT PAPER)

Gender / Category	Regular period	During the extended period (with late fee)
Female/SC/ST/PwD category candidates	₹750	₹1250
All other candidates	₹1500	₹2000

EXAMINATION CENTRES

GATE-2021 examination will be conducted in select cities and towns in India.

BAR CODE

All candidates must apply online at GATE Online Application Processing System (GOAPS).

For online application, information brochure and further details, visit the following URL:

https://gate.iitb.ac.in

Futher details can be obtained by accessing any of the GATE zonal web pages as well.

IISc Bangalore
gate.iisc.ac.in

IIT Bombay
gate.iitb.ac.in

IIT Delhi
gate.iitd.ac.in

IIT Guwahati
iitg.ac.in/gate-jam/

IIT Kanpur
gate.iitk.ac.in

IIT Kharagpur
gate.iitkgp.ac.in

IIT Madras
gate.iitm.ac.in

IIT Roorkee
iitr.ac.in/gate

GATE 2021

- GATE2021Website
- GATE2021 Information Brochure
- GATE2021 DATES

FAQ (BE CS Students) :

- Eligibility : NO age limit, NO attempt limit.
- 2 PAPERS : Any ONE or TWO.
    - Primary – CS (Compulsory : fees [female: 750/- , others: 1500/-])
    - Secondary – MA (Optional : fees [female: 750/- , others: 1500/-])
- Types or Questions
    - MCQ (1m or 2m : Negative Marking (deduction of 1/3rd of weighted marks)
    - MSQ (1m or 2m : NO Negative Marking)
    - NAT (1m or 2m : NO Negative Marking)
- GA : General Aptitude (10Q's [5Q's 1m each & 5Q's 2m each]=15m Compulsory Section) Click to check Syllabus of this sections.
- Subject (CS / MA)
    - CS Syllabus
    - MA Syllabus
- Paper1 CS :
    - GA Section (10Q's Total 15M)
        - 5Q's MCQ (1m each)
        - 5Q's MCQ (2m each)
    - CS Section (55Q's Total 85M)
        - 25Q's : some MCQ some MSQ (1m each)
        - 15Q's : some MCQ some MSQ (2m each)
        - 15Q's NAT(2m each)
- Paper2 MA:
    - GA Section (10Q's Total 15M)
        - 5Q's MCQ (1m each)
        - 5Q's MCQ (2m each)
    - MA Section (55Q's Total 85M)
        - 25Q's : some MCQ some MSQ (1m each)
        - 30Q's : some MCQ some MSQ some NAT(1m or 2m each)
- //3
- List Of Examinations in Cities
- Previous Year Papers
    - GATE 2020 CS && Answer Key ;; GATE 2020 MA && Answer Key
    - GATE 2019 CS && Answer Key ;; GATE 2019 MA && Answer Key
    - GATE 2018 CS && Answer Key ;; GATE 2018 MA && Answer Key
- //2
- CONTACT (Mon-Fri : 10AM-6PM): Chairperson, GATE Indian Institute of Technology Bombay, Powai, Mumbai 400 076 ; 022-25767068 ,022-25767022 ; gate2021 @ iitb.ac.in https://www.linkedin.com/in/gate-jam-3104201a9/

GATE 2021 CS : Computer Science and Information Technology

PRIMARY PAPER : COMPULSORY

Marks : 100M total (15m:GA , 85m : CS)

syllabus

GA : 15m

General Aptitude (15m)

- **Verbal Aptitude**
  - Basic English grammar: tenses, articles, adjectives, prepositions, conjunctions, verb-noun agreement, and other parts of speech
  - Basic vocabulary: words, idioms, and phrases in context
  - Reading and comprehension
  - Narrative sequencing
- **Quantitative Aptitude**
  - Data interpretation: data graphs (bar graphs, pie charts, and other graphs representing data), 2- and 3-dimensional plots, maps, and tables
  - Numerical computation and estimation: ratios, percentages, powers, exponents and logarithms, permutations and combinations, and series
  - Mensuration and geometry
  - Elementary statistics and probability
- **Analytical Aptitude**
  - Logic: deduction and induction
  - Analogy
  - Numerical relations and reasoning
- **Spatial Aptitude**
  - Transformation of shapes: translation, rotation, scaling, mirroring, assembling, and grouping
  - Paper folding, cutting, and patterns in 2 and 3 dimensions

CS : 85m

General Mathematics (15m)

- **Section1: Engineering Mathematics (15m)**
  - **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.
  - **Linear Algebra:**
    - Matrices, determinants, system of linear equations, eigenvalues and eigenvectors, LUdecomposition.
  - **Calculus:**
    - Limits, continuity and differentiability. Maxima and minima. Mean value theorem.
    - Integration.
  - **Probability and Statistics:**
    - Random variables.
    - Uniform, normal, exponential, poisson and binomial distributions.
    - Mean, median, mode and standard deviation.
    - Conditional probability and Bayes theorem.

Computer Science and Information Technology

• Section 2: Digital Logic

- Boolean algebra.
- Combinational and sequential circuits. Minimization.
- Number representations and computer arithmetic (fixed and floating point).

• Section 3: 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).

• Section 4: Programming and Data Structures.

- Programming in C.
- Recursion. Arrays, stacks, queues, linked lists, trees, binary search trees, binary heaps, graphs.

• Section 5: 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.

• Section 6: Theory of Computation.

- Regular expressions and finite automata.
- Context-free grammars and push-down automata.
- Regular and context-free languages, pumping lemma.
- Turing machines and undecidability.

• Section 7: Compiler Design.

- Lexical analysis, parsing, syntax-directed translation.
- Runtime environments.
- Intermediate code generation.
- Local optimisation, Data flow analyses: constant propagation, liveness analysis, common subexpression elimination.

Section 8: 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.

Section 9: 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.

Section 10: 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.

NOTE:-