Learning Strategies to score 55+ marks in GATE exam easily

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"Before we dive deep into the analysis of the subjects please look at the syllabus of GATE 2024."

SYLLABUS FOR GATE CS 2024

General Aptitude

Verbal Ability:

1. Basic English Grammar
   1. Tenses
   2. Articles
   3. Adjectives
   4. Prepositions
   5. Conjunctions
   6. Verb-Noun Agreement
   7. Other parts of Speech.
2. Basic Vocabulary
   1. Words
   2. Idioms and phrases
   3. In context reading and comprehension
   4. Narrative Sequencing.

Quantitative Aptitude:

1. Data Interpretation
   1. Data Graphs
      1. Bar Graphs
      2. Pie Charts
      3. Other Graphs representing data
   2. 2 and 3-dimensional plots
   3. Maps
   4. Tables.
2. Numerical Computation and estimation
   1. Ratios
   2. Percentages
   3. Powers
   4. Exponents
   5. Logarithms
   6. Permutation and Combination
   7. Series .
3. Mensuration and Geometry.
4. Elementary Statistics and Probability.

Analytical Aptitude:

1. Logic
    1. Deduction and Induction.
2. Analogy.
3. Numerical Relations and Reasoning.

Spatial Aptitude:

1. Transformation of Shapes
    1. Translation
    2. Rotation
    3. Scaling
    4. Mirroring
    5. Assembling and Grouping
    6. Paper folding, cutting, and patterns in 2 and 3 dimensions.

Section1: Engineering Mathematics

Discrete Mathematics:

1. Propositional and first order logic.
2. Sets, relations, functions, partial orders and lattices.
3. Monoids.
4. Groups.
5. Graphs: connectivity, matching, coloring.
6. Combinatorics: counting, recurrence relations, generating functions.

Linear Algebra:

1. Matrices, determinants, systems of linear equations, eigenvalues and eigenvectors, LU decomposition.

Calculus:

1. Limits, continuity, and differentiability.
2. Maxima and minima.
3. Mean value theorem.
4. Integration.

Probability and Statistics:

1. Random variables.
2. Uniform, normal, exponential, Poisson and binomial distributions.
3. Mean, median, mode and standard deviation.
4. Conditional probability and Bayes theorem.

Computer Science and Information Technology

Section 2: Digital Logic

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

Section 3: Computer Organization and Architecture

1. Machine instructions and addressing modes.
2. ALU, data-path and control unit.
3. Instruction pipelining, pipeline hazards.
4. Memory hierarchy
    1. Cache

2. Main memory
3. Secondary storage.
5. I/O interface (interrupt and DMA mode).

Section 4: Programming and Data Structures

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

Section 5: Algorithms

1. Searching, sorting, hashing.
2. Asymptotic worst-case time and space complexity.
3. Algorithm design techniques
    1. Greedy
    2. Dynamic programming
    3. Divide-and-conquer.
4. Graph traversals, minimum spanning trees, shortest paths.

Section 6: Theory of Computation

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

Section 7: Compiler Design

1. Lexical analysis, parsing, syntax-directed translation.
2. Runtime environments.
3. Intermediate code generation.
4. Local optimization.
5. Data flow analyses
    1. Constant propagation
    2. Liveness analysis
    3. Common subexpression elimination.

Section 8: Operating System

1. System calls, processes, threads, inter-process communication, concurrency, and synchronization.
2. Deadlock.
3. CPU and I/O scheduling.
4. Memory management and virtual memory.
5. File systems.

Section 9: Databases

1. ER-model.
2. Relational model
    1. Relational algebra
    2. Tuple calculus
    3. SQL.
3. Integrity constraints, normal forms.
4. File organization, indexing (e.g., B and B+ trees).
5. Transactions and concurrency control.

Section 10: Computer Networks

1. Concept of layering
    1. OSI
    2. TCP/IP Protocol Stacks.

　　2. Basics of packet, circuit and virtual circuit-switching.

　　3. Data link layer

　　　　1. Framing

　　　　2. Error detection

　　　　3. Medium Access Control

　　　　4. Ethernet bridging.

　　4. Routing protocols

　　　　1. Shortest path

　　　　2. Flooding

　　　　3. Distance vector

　　　　4. Link state routing.

　　5. Fragmentation and IP addressing, IPv4, CIDR notation, Basics of IP support protocols (ARP, DHCP, ICMP), Network Address Translation (NAT).

　　6. Transport layer

　　　　1. Flow control and congestion control,

　　　　2. UDP

　　　　3. TCP

　　　　4. Sockets.

　　7. Application layer protocols

　　　　1. DNS

　　　　2. SMTP

　　　　3. HTTP

　　　　4. FTP

　　　　5. Email.

The table below is prepared by our mentors after a thorough analysis of the last 20 previous year papers and come up with a plan to easily score 55+ marks in the GATE exam so that the aspirant following the schedule will get a chance in the top 20 premier universities.

Subject Name	Weightage	Chances of scoring in percentage% (assuming you dont do silly mistakes.)	Topics	Remarks
TOC & CD	10-12	90%	All	Tricky: Decidability and undecidability. 14 marks in GATE 2019
DLD	6-8	90%	All	Counters (synchronous and asynchronous). In GATE 2019 7 marks in total and no question from counters. Most probable topics are : Logic gates, complement system, Boolean algebra(K - Map)
Graph theory	3-4	90%	All	
Group theory + Algebraic structures	0-2	100%	All	
Recurrence relations and generating functions	1-3	80%	All	
linear algebra	2-3	100%	All	This is the easy part of Engineering Maths, least effort and no tricky question. In GATE 2019 3 marks

Aptitude	6-9	90%	All	If you wish to be in the top 100 this is a must, please don't neglect this. you need preparation. In GATE 2019 6 marks.
Permutations, Combinatorics and Probability	2-4	70%	All	In GATE 2019 2 marks.
Calculus	1-3	70%	All	In GATE 2019 1 marks.
Mathematical Logic	1-3	55%	All	Easy to score but can be tricky.
Data structures	5-8	85%	ALL except Hashing	Sometimes it can be tricky from Hashing. In GATE 2019 5 marks in total mostly covered from BST
Algorithms	8-11	65%	Easy topics: asymptotic notations, master theorem, sorting & searching, greedy(Huffman encoding, optimal merge pattern, graph traversals)	Tricky: Rest of the topics
Database	6-9	65%	Easy: Transactions & Concurrency control protocols, FD's, Normalizations, File systems	Tricky: SQL,RA, TRC, DRC, ER-diagram to Relation. There is a chance you can score more than the given percentage as questions asked in GATE are of medium level. In GATE 2019 8 marks in total. Two 2 marks questions from querying(RA, SQL). Rest of the questions are from FD, Concurrency and B,B+ trees. NOTE: Queries asked are bit easy to answer.
Operating System	8-9	65%	EASY: memory management, process scheduling, file management	Tricky: Inter-process communication, concurrency and synchronization, deadlocks can be tricky sometimes. In GATE 2019 8 marks in total. One question from demand paging, 2 from deadlock, 1 from process synchronization and 1 from disk scheduling. Out of them one difficult question from deadlock and one from synchronization.
C Programming	3-7	60%		Questions on pointers and arrays are confusing and there is chance of making silly mistakes. Recursion programming questions can be lengthy. In GATE 2019 11 marks in total. 4 marks on pointers , function calling ,array are difficult questions

Computer Networks	7-9	60%	Easy: Subnetting	Tricky: Transport layer is tricky. In GATE 2019 7 marks.
Computer Organization	5-8	50%	Easy: Addressing Modes, Floating point Arithmetic, Memory management, pipelining	Tricky: Interrupt handling. In GATE 2019 3 marks

✓ In the table above the Subject Name column defines the top down approach of studying the subjects. (For example start with TOC & CD followed by DLD and at the end Computer Organization.)

✓ The next column is the Weightage column which defines the marks weightage which can be expected from each subject/topics in the GATE Exam. The analysis of the same is done taking the last 20 years of GATE Questions Papers into consideration.

✓ The Third Column specifies the percentage which you can score easily. (For example TOC & CD has a weightage of around 10-12 marks then 90% of it is easily scorable, i.e., 9-11 marks can be scored)

✓ The Topics column specifies the easy topics which one should never miss them.

✓ The last column is for specifying the tricky topics where students generally does the mistakes or complex to learn. For a few subjects we have also mentioned the easy topics in this column and also the marks distribution of the particular/subject or topic on the basis of GATE 2019 Question Paper and some comments on those questions.

Below is the detailed analysis of the above content. (Please note if you get a clear picturization from the table please do not read this)

The strategy for achieving a (50-55)+ marks in GATE CS exam you can follow the following study pattern: (The strategy below is made after a lot of research and analysis)

1. Try to start with Theory of Computation and Compiler Design. It has a lot of topics to be covered but are also very easy once you are clear with the concept. This particular subject has a weightage of around 10-12 marks. Approximately 90% of this is easily scorable if you are clear with all the basic concepts. The only topic which seems to be very tricky in this subject is Decidability and Undecidability. This topic carries 1-2 marks. In GATE 2019 14 marks was the subject weightage.

2. The second most scoring subject is Digital Logic Design. The weightage of the same being 6-8 marks and 90% of it is easily scorable. The topic which seems to be tricky here is Synchronous and Asynchronous Counters. In GATE 2019 7 marks was covered from Digital Logic Design and the most probable topics here are Logic Gates, Complement System, Boolean Algebra (K-Map).

3. Now after the completion of the above two subjects one can start with Engineering and Discrete Mathematics. As the syllabus is huge for the subject we recommend to break it into topics and study accordingly

    a. Graph Theory is the most scoring among all having a weightage 3-4 marks and 90% of it easily scoring.

    b. Followed by Group Theory and Algebraic Structures having 0-2 marks of weightage and is 100% scoring.

    c. Then comes the Recurrence Relations and Generating Functions with 1-3 marks out of which 80% of them is scoring.

    d. Linear Algebra is the easiest part of Engineering Mathematics and very less effort is required for the same. In GATE 2019 3 marks was there.

4. Before completion of the Engineering and Discrete Mathematics now first complete the Aptitude which students generally skip or keep it for the end. But it is very important as this is very scoring. 15 marks is fixed for Aptitude + English. For English there is nothing to learn as such, it will be totally dependent upon the students knowledge of English. So we will keep English aside for the time being

and focus on Aptitude. The weightage for the same is 6-9 marks. 90% of it easily scorable.

If you wish to be in top 100 then preparation for Aptitude is also required, neglecting this will affect a lot. In Gate 2019 6 marks was from Aptitude.

5. Now after this again shift to Engineering and Discrete Mathematics.

   a. Start with Permutation, Combinatorics and Probability which has a weightage of 2-4 marks. 70% is scorable as we have topics like Bayes Theorem and Combinatorics from where we can get some tricky questions. 2 marks was there in GATE 2019.

   b. Followed by Calculus which has weightage of 1-3 marks. 70% of it is scorable. 1 mark question was there in GATE 2019.

   c. Lastly cover Mathematical Logic having a weightage of 1-3 marks. 55% of it is scorable. It is easily scorable but it is very tricky at times. Tricky portion is First Order Logic.

6. After the completion of above start with Data Structures having 5-8 marks. 85% is very easy to score. All topics are easy except Hashing. In GATE 2019 5 marks is there and mostly it is from BST.

7. Algorithms is the next which has 8-11 marks. 65% of it is scorable easily. Easy topics are Asymptotic Notations, Master Theorem, Sorting and Searching, Greedy (Huffman Encoding, Optimal Merge Pattern, Graph Traversal). Except these all the others are tricky topics.

8. Database has a weightage of around 6-9 marks. 65% of it can be scored with ease. The easy topics are Transactions & Concurrency control protocols, FD's, Normalizations, File systems. The tricky topics are SQL,RA, TRC, DRC, ER-diagram to Relation. There is a chance you can score more than the given percentage as questions asked in GATE are of medium level. In GATE 2019 8 marks in total. Two 2 marks questions from querying(RA, SQL). Rest of the questions are from FD, Concurrency and B,B+ trees. NOTE: Queries asked are bit easy to answer.

9. Operating System is the next and the weightage for the same is 8-9 marks. 65% of it is scorable easily by covering the following easier topics: memory management, process scheduling, file management. The tricky topics are Inter-process communication, concurrency and synchronization, deadlocks. In GATE 2019 we analysed that 8 marks in total. One question from demand paging, 2 from deadlock, 1 from process synchronization and 1 from disk scheduling. Out of them one difficult question from deadlock and one from synchronization.

10. C-Programming has 3-7 marks weightage. 60% of it is scorable. The tricky part is pointers and arrays. Recursion programming questions can be lengthy. In GATE 2019 11 marks in total.

11. In Computer Networks 7-9 marks is the weightage. 60% is scorable. Subnetting is considered to be very easy but basic should be very clear about that. Transport layer seems to be very tricky. 7 marks was covered in GATE 2019.

12. Computer Organization is the last subject with 5-8 marks weightage and only 50% of it is easy to score. The easy topics are Addressing Modes, Floating point Arithmetic, Memory management, pipelining and the tricky part is Interrupt Handling. In GATE 2019 3 marks was only there.

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