

## **Section 1: Engineering Mathematics**

**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, LU decomposition.

**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.

# GRE Syllabus

The Graduate Record Examination (GRE) score is used as a criterion for admission into graduate-level courses across the globe. The GRE exam tests the candidate's aptitude among three segments- Quantitative Reasoning, Verbal Reasoning and Analytical Writing. The Quantitative and Verbal sections can be scored in the range of 130-170 marks with one mark increment for each correct answer. Analytical Writing is scored between 0-6 with intervals of 0.5 marks.

The total test takes 3 hours and 45 minutes. The Analytical Writing segment always comes first and it takes 30 minutes for each of the two questions. The Verbal Reasoning segment is divided into two sections of 20 questions each and 30 minutes is allotted to per section. The Quantitative Reasoning segment is similar to the Verbal section in structure, but gives you 35 minutes per section.

## The GRE Exam Syllabus

1. **Analytical Writing:** This section has two types of questions viz, Analyze an Issue and Analyze an Argument. This section is designed to test the candidate's ability to think critically and articulate the points to support their ideas in a clear and structured manner.

(i) Analyze an Issue: In this question, the candidate is asked to take a view on the issue given, and elaborate on why they've taken that position. This tests the critical thinking ability of the candidate.

(ii) Analyze an Argument: While the candidate is asked to take a side in Analyze an Issue, here they're presented with one. The candidate's job is to evaluate the position taken by the author. This tests the logical thinking ability of the candidate.

2. **Verbal Reasoning.** This section has three types of questions. It measures the candidate's ability to draw assumption from incomplete data, understand the meanings of words and understand the structure of a text. This section requires the candidate to have a healthy vocabulary.

(i) **Reading Comprehension:** The passages for this part is taken from everyday academic topics. The length of the paragraph can range from one to five. The candidate has to read, understand and answer the questions either in multiple-choice format or selecting in-sentence.

(ii) **Text Completion:** This involves a paragraph of the length of 5 sentences, where there can be one to three blanks. The candidate has to pick the correct option and there is no marks for partially correct answers.

**(iii) Sentence Equivalence:** There will be one sentence given with one blank. The candidate has to choose two options out of the six, such that the meaning of the sentence is similar for both the options.

**3. Quantitative Reasoning:** This section tests the high school math aptitude of the candidate. There are no tough problem solving topics like calculus or trigonometry. The candidates can make use of the on-screen calculator available.

The topics involved are:

1. Arithmetic: Percent, Ratio, Rate, Sequence, Factorization, Decimal Representations.
2. Algebra: Exponents, Algebraic Expressions, Relations And Functions, Quadratic Equations, Inequalities, Coordinate Geometry, Graphs, Intercept, Slopes.
3. Geometry: Circles, Triangles, Types Of Triangles, Cylinder, Quadrilateral, Polygons, Concurrent And Similar Figures, Area, Perimeter, Volume, Pythagoras Theorem.
4. Data Analysis: Mean, Median, Mode, Standard Deviation, Quartiles And Percentiles, Line, Bar, Pie Graphs, Probability, Conditional Probability, Random Variables, Permutations And Combinations.

Now that you know the syllabus for the ETS GRE exam, feel free to follow this [1-month study plan](#) to help you structure your preparation.

Section	GRE Syllabus
Verbal Reasoning	<b>Basic sentence structure, verb tense, idioms and idiomatic expression, pronoun agreement, subject-verb agreement, modifiers, parallelism, great vocabulary</b>
Quantitative Reasoning	<b>Number, percentage, profit and loss, ratio and proportion, simple and compound interest, speed distance and time, permutation and combination, linear equation, quadratic equation, set theory, statistics, powers and roots, probability, work and time, geometry, co-ordinate geometry, mensuration</b>
AWA	<b>Basic sentence structure</b>

Byjus will be glad to help you in your GRE preparation journey. You can ask for any assistance related to GRE from us by just giving a missed call at **08039513255**, or you can drop an SMS. You can write to us at [gre@byjus.com](mailto:gre@byjus.com).

