FUTURE TOPPER

Empowering CUET Aspirants

CUET 2027

Syllabus

Mathematics / Applied Mathematics

Subject Code: 319

Based on the Latest Official CUET (UG) 2026 Syllabus released by NTA

Section A1 – Common to both Mathematics and Applied Mathematics

1. Algebra

- Matrices and types of Matrices
- Equality of Matrices, Transpose of a Matrix, Symmetric and Skew Symmetric Matrix
- Algebra of Matrices
- Determinants
- Inverse of a Matrix
- Solving simultaneous equations using Matrix Method

2. Calculus

- Higher order derivatives up to second order
- Increasing and Decreasing Functions
- Maxima and Minima

3. Integration and its Applications

- Indefinite integrals of simple functions
- Evaluation of indefinite integrals
- Definite Integrals
- Application of Integration as area under the curve (simple curve)

4. Differential Equations

- Order and degree of differential equations
- Solving differential equations with variable separable

5. Probability Distributions

- Simple Probability

6. Linear Programming

- Graphical method of solution for problems in two variables
- Feasible and Infeasible regions
- Optimal feasible solution

Section B1 – Mathematics

Unit I: Relations and Functions

- Relations and Functions: Reflexive, symmetric, transitive and equivalence relations; one to one and onto functions.
- Inverse Trigonometric Functions: Definition, range, domain, principal value branches; graphs of inverse trigonometric functions.

Unit II: Algebra

- Matrices: Concept, notation, order, equality, types, zero matrix, transpose, symmetric and skew symmetric matrices; operations on matrices; invertible matrices.
- Determinants: Determinant of a square matrix (up to 3×3), minors, cofactors, area of a triangle; adjoint and inverse of a square matrix; solving system of linear equations.

Unit III: Calculus

- Continuity and Differentiability: Chain rule; derivatives of inverse trigonometric functions; implicit functions; exponential and logarithmic functions; logarithmic differentiation; parametric forms; second-order derivatives.
- Applications of Derivatives: Rate of change, increasing/decreasing functions, maxima and minima.
- Integrals: Integration as inverse of differentiation; integration by substitution, partial fractions and by parts; standard integral forms; fundamental theorem of calculus; definite integrals.
- Applications of Integrals: Area under simple curves, lines, circles, parabolas, and ellipses.
- Differential Equations: Definition, order and degree; general and particular solutions; separation of variables; homogeneous and linear differential equations.

Unit IV: Vectors and Three-Dimensional Geometry

- Vectors: Scalars and vectors; direction cosines and ratios; types of vectors; position vector; addition, scalar multiplication; dot product and cross product.
- Three-Dimensional Geometry: Direction cosines and ratios of a line; Cartesian and vector equations of a line; skew lines; shortest distance; angle between two lines.

Unit V: Linear Programming

- Introduction; constraints; objective function; graphical method; feasible and infeasible regions; optimal feasible solutions.

Unit VI: Probability

- Conditional probability; multiplication theorem; independent events; total probability; Baye's theorem.

Section B2 – Applied Mathematics

Unit I: Numbers, Quantification and Numerical Applications

- Modulo Arithmetic: Define modulus of an integer; apply arithmetic operations using modular arithmetic rules.
- Congruence Modulo: Define congruence modulo; apply the definition in various problems.
- Allegation and Mixture: Rule of allegation; mean price of a mixture.
- Numerical Problems: Solve real-life problems mathematically.
- Boats and Streams: Upstream and downstream; express as equations.
- Pipes and Cisterns: Time taken by two or more pipes to fill or empty a tank.
- Races and Games: Compare performance of two players w.r.t. time, distance.
- Numerical Inequalities: Basic concepts; writing and solving numerical inequalities.

Unit II: Algebra

- Matrices and types; equality, transpose, symmetric and skew symmetric matrices; algebra of matrices; determinants; inverse of a matrix; solving simultaneous equations.

Unit III: Calculus

- Higher Order Derivatives; Application of Derivatives; Marginal Cost and Marginal Revenue; Increasing/Decreasing Functions; Maxima and Minima; Integration; Indefinite and Definite Integrals; Application of Integration (Consumer Surplus – Producer Surplus); Differential Equations.

Unit IV: Probability Distributions

- Probability Distribution; Mathematical Expectation; Variance; Binomial Distribution; Poisson Distribution; Normal Distribution.

Unit V: Time Based Data

• Time Series; Components of Time Series; Time Series Analysis for Univariate Data; Secular Trend; Methods of Measuring Trend.

Unit VI: Inferential Statistics

• Population and Sample; Parameter and Statistics and Statistical Inferences; Central Limit Theorem; t-Test (one sample t-test for a small group sample).

Unit VII: Financial Mathematics

• Perpetuity and Sinking Funds; Calculation of EMI; Rate of Return and Nominal Rate of Return; Compound Annual Growth Rate; Linear Method of Depreciation; Valuation of Bonds.

Unit VIII: Linear Programming

• Introduction and terminology; Mathematical formulation of LPP; Types of LPP; Graphical method; Feasible and infeasible regions; Optimal feasible solution.

Important Notes

• This syllabus is based on the official CUET (UG) 2026 syllabus released by NTA.
• No official CUET 2027 syllabus has been released at the time of this publication.
• Students are advised to regularly check the NTA official website (nta.ac.in) for updates.
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