STUDY IQ IAS

#UPSC #IAS

MATHEMATICS

OPTIONAL 2025

NOVEMBER BATCH

DAILY LIVE CLASS & TEST SERIES

ANKIT TIWARI

SENIOR FACULTY - MATHEMATICS

18th Nov' 24 **12:00 PM**

It is said that Optional determines the destiny of UPSC journey. It is the most important weapon to conquer this exam. To get into the final list, one must ace the optionals.

Mathematics Optional Batch 2025

StudyIQ is here with its Mathematics Optional Course. Let's start with understanding the Merits of Mathematics Optional.

Scoring optional: The subject is factual and logical rather than opinion-based or subjective, hence easy to score 300+ marks.

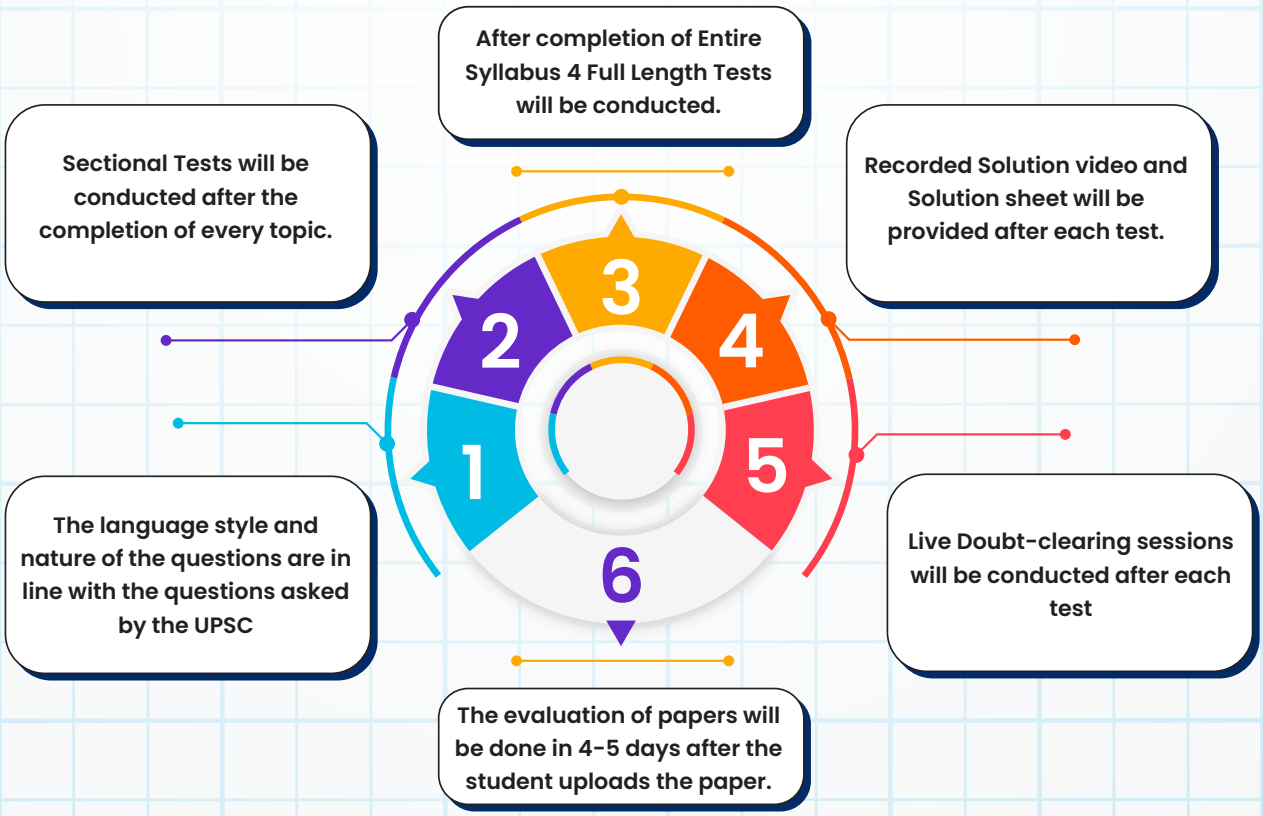
Breaks Monotonicity from GS preparation: Apart from the theorems and formulas, you don't have to memorize many things in this paper.

The syllabus of Maths Optional is static in nature and not linked to current affairs, hence no regular updation is required.

Features of the Course

- 600 hours of Live lectures spread over 6 months
- Comprehensive coverage of each and every topic
- More than 1500+ questions in form of practice sheets.
- Formula Sheets will be provided for each and every topic
- Previous Year Questions discussions from Civil Service Exam and Indian Forest Service
- Regular Doubt-clearing sessions by the faculty

Features of the Test Series



Note: During the first few days few orientation sessions will be conducted. The students will be informed regarding the timings of such session in advance.

Schedule of the Classes and Tests

Starting Few Classes will be at 11:00 AM

18th November - Orientation

Paper	Topic	Sub Topic
Paper 1	Analytic Geometry	• Introduction, Co-ordinate System • Conversion of Co-ordinate system • Planes 1 • Planes 2 • Planes 3 • Straight Lines 1 • Straight Lines 2 • Sphere 1 • Sphere 2 • Sphere 3 • Cone 1 • Cone 2 • Cylinder 1 • Cylinder 2 • Introduction to Conicoid • Paraboloid 1 • Paraboloid 2 • Ellipsoid 1 • Ellipsoid 2 • Hyperboloid 1 • Hyperboloid 2

Sectional Test on Algebra

Paper	Topic	Sub Topic
Paper 1	Ordinary Differential Equation	• Introduction to Differential Equation • Formulation of Differential Equation • Linear Differential equation • Integrating Factor • Orthogonal Trajectories • Higher order Differential Equations • Variation of Parameters • Clairaut's equation • Cauchy Euler Equation • Laplace Transform & Theorems • Inverse Laplace transform • Application of Laplace transform

Sectional Test on Ordinary Differential Equation

Paper	Topic	Sub Topic
Paper 1	Vector Analysis	• Introduction to Vector Calculus • Scalar & Vector fields • Differentiation of Vector Field of Scalar variables • Gradient & Vectors • Divergence & Curl • Higher Order derivatives, Vector identities • Vector equation • Curvature & Torsion • Serret & Fernet's Formulae • Gauss divergence theorem, Stokes theorem • Stokes theorem, Green's Identities

Sectional Test on Vector Analysis

Paper	Topic	Sub Topic
Paper 1	Dynamics & Statics	• Rectilinear motion, simple harmonic motion, motion in a plane, projectiles • Constrained motion • Work and energy, conservation of energy • Kepler's laws, orbits under central forces. • Equilibrium of a system of particles • Work and potential energy, friction, Common catenary • Principle of virtual work • Stability of equilibrium, equilibrium of forces in three dimensions.

Sectional Test on Dynamics & Statics

Paper	Topic	Sub Topic
Paper 2	Modern Algebra	• Introduction to Abstract Algebra • Groups 1 • Groups 2 • Sub groups, Normal groups • Cosets • Lagrange's theorem • Homomorphism of groups • Cyclic & Quotient groups • Basic Isomorphism theorem • Permutation groups • Cayley's theorem • Rings • Subrings & Ideals • Ideals & Homomorphism • Euclidean Ring, Polynomial ring • Integral domain, Principal ideal domain • Euclidean domain, Unique factorization domain • Finite & Quotient fields • Sylow theorem

Sectional Test on Modern Algebra

Paper	Topic	Sub Topic
Paper 2	Real Analysis	• Introduction to Real analysis • Real analysis • Sequences • Cauchy's sequence • Infinite & Alternating series • Convergence • Continuity & Differentiability • Riemann Integral 1 • Riemann Integral 2 • Improper Integrals 1 • Improper Integrals 2 • Fundamental Theorems • Integrability • Revision session

Sectional Test on Real Analysis

Paper	Topic	Sub Topic
Paper 2	Complex Analysis	• Introduction to Complex Numbers • Limits, Continuity & Differentiability • Analytic Functions • Cauchy Riemann's equation, Cauchy theorem • Cauchy Integral Formula • Power series representation, Singularities • Taylor, Laurent series • Contour Integration • Cauchy Residue theorem

Sectional Test on Complex Analysis

Paper	Topic	Sub Topic
Paper 2	Linear Programming Problem	• Introduction to Linear programming • Graphical method & Simplex method • Simplex method • Duality • Basic feasible solution • Optimal solution • Transportation & Assignment problems 1 • Transportation & Assignment problems 2

Sectional Test on Linear Programming Problem

Paper	Topic	Sub Topic
Paper 2	Partial Differential Equation	• Introduction to PDE • Formation of PDE & Family of surfaces in 3D • Solution of Quasi linear PDE • Cauchy's method • Higher order Homogenous PDE • Application of PDE • Vibration strings • Heat equation • Laplace equation • Canonical form

Sectional Test on Partial Differential Equation

Paper	Topic	Sub Topic
Paper 2	Numerical Analysis & Computer Programming	• Solution of Algebraic equation • Bisection & Regular falsi method • Newton Raphson, Gauss elimination • Gauss Jordan, gauss seidel method • Newton Interpolation, Lagrange's Interpolation • Simpson rule, Trapezoidal rule • Gaussian quadrature formula, Numerical solution of ODE • Euler's & Ranga Kutta method • Binary, Octal, Hexa decimal Number system • Conversion & Algebra of Binary numbers • Elements of Computer system & Concept of memory • Truth table, Boolean algebra • Representation of Integers, Algorithm & Flowcharts

Sectional Test on Numerical Analysis & Computer Programming

Paper	Topic	Sub Topic
Paper 2	Mechanics & Fluid Dynamics	• Introduction to Fluid • Euler's & Lagrange's equation • Kinematics of Fluid flow • Boundary condition • Stream line flow, Path of particles • Sources & Sinks • Method of Images • Axisymmetric flow • Vortex flow 1 • Vortex flow 2 • Navier's – Stokes equation • Introduction to Mechanics • Moment of Inertia • D Alembert's principle • Generalized co-ordinates • Lagrange's equation • Hamilton equation • Motion of body in 2D

Sectional Test on Mechanics & Fluid Dynamics

Paper	Topic	Sub Topic
Paper 1	Linear Algebra	• Introduction, Vector spaces over R & C • Linear Dependence & Independence • Sub Spaces & Bases • Dimensions, Matrix of linear transformation • Rank of Matrix • Nullity • Algebra of Matrices • Row & Column reduction • Echelon form, Rank of Matrices • Types of Matrices • Eigen values & Vectors • Solution of System of Linear equations • Characteristics Values & Vectors • Caley Hamilton theorem • Quadratic form

Sectional Test on Linear Algebra

Paper	Topic	Sub Topic
Paper 1	Calculus	• Introduction to Calculus, Functions • Limits & Continuity • Continuity & Differentiability • Mean Values theorem & problems • Taylor theorem, Indeterminate form • Maxima & Minima, Asymptotes • Curve tracing • Function of 2 or 3 variables • Partial derivatives • Lagrange's method of multiplier • Jacobian Functions • Introduction to Integral Calculus • Reimann's function • Indefinite Integral • Definite Integrals • Infinite & Improper Integrals • Double Integrals • Triple Integrals • Area & Surfaces • Surface & Volume

Sectional Test on Calculus

Test	Paper
25th Feb '25	Full Length Paper 1
25th Feb '25	Full Length Paper 2
25th Mar '25	Full Length Paper 1
10th Apr '25	Full Length Paper 2

*** Please note that this is a tentative schedule of the batch and the dates may vary.**

*** Initial few orientation classes will be held from 11:00-12:30. .**

Price: ~~₹28,000~~

₹16,999

Enrol Now

76-4000-3000

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