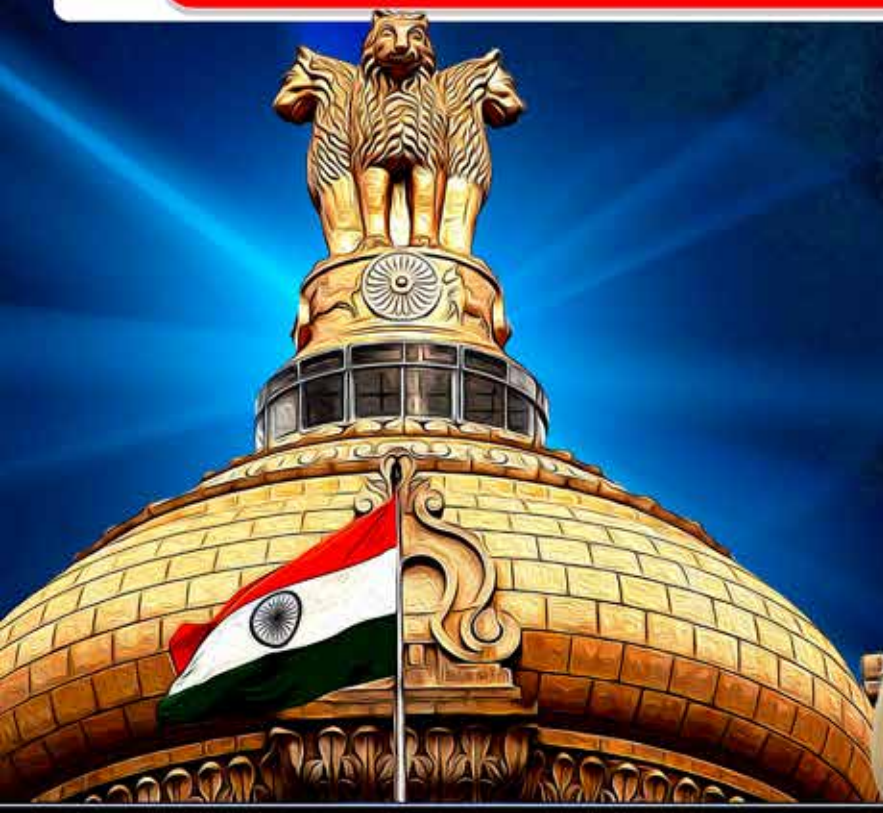
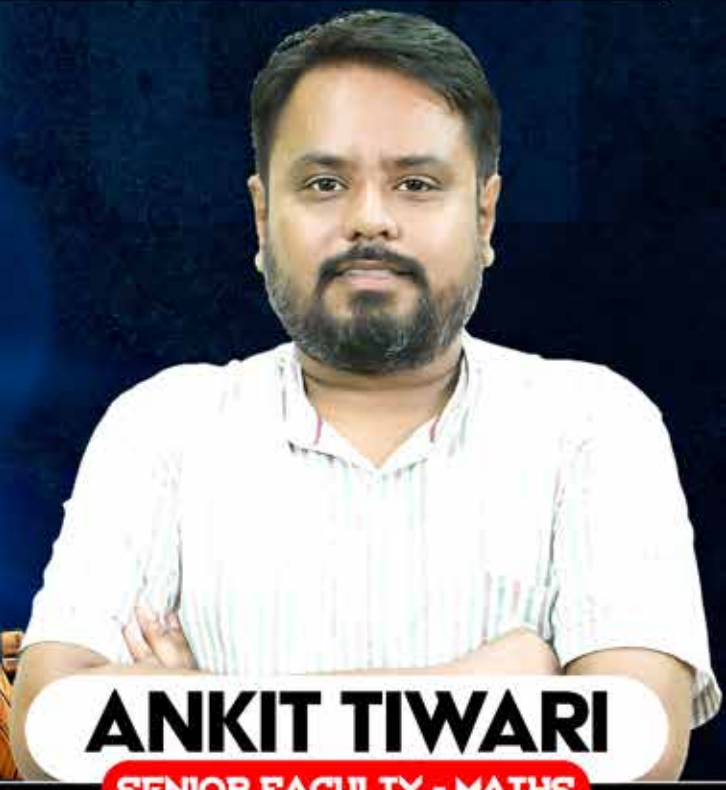
STUDY IQ IAS

# UPSC IAS
# MATHEMATICS
## OPTIONAL 2026
## NEW YEAR BATCH
### LIVE CLASSES & TEST SERIES





**ANKIT TIWARI**

SENIOR FACULTY - MATHS

**7th Jan' 25**

**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

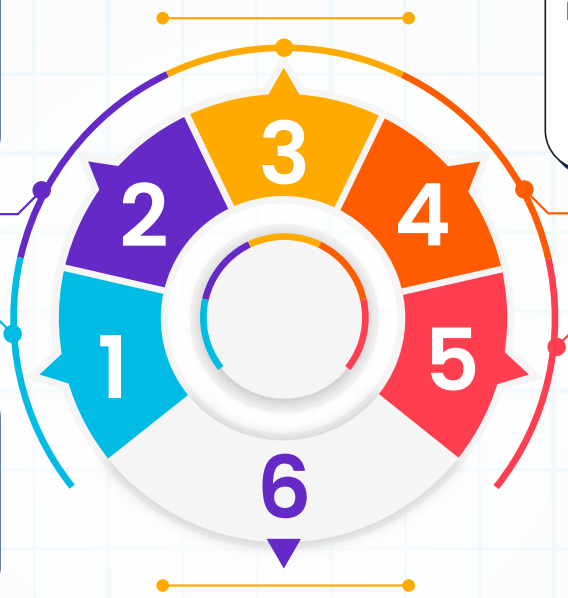
StudyIQ is here with its Mathematics Optional Course. Let's start with understanding the Merits of Mathematics Optional.

**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 Test Series




1. The language style and nature of the questions are in line with the questions asked by the UPSC
2. Sectional Tests will be conducted after the completion of every topic.
3. After completion of Entire Syllabus 4 Full Length Tests will be conducted.
4. Recorded Solution video and Solution sheet will be provided after each test.
5. Live Doubt-clearing sessions will be conducted after each test
6. The evaluation of papers will be done in 4-5 days after the student uploads the paper.

**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.**

| Features | Gold | Platinum |
| --- | --- | --- |
| 400+ hours of live lectures spread over 6 months | ✓ | ✓ |
| Live Doubt Clearing Sessions with Faculty | ✓ | ✓ |
| Recorded Lectures & Hand written Notes and Crux | ✓ | ✓ |
| Comprehensive Coverage of Every Topic with PYQ Discussion | ✓ | ✓ |
| Current affairs to keep the aspirants updated | ✓ | ✓ |
| Regular answer writing sessions with evaluation | ✗ | ✓ |
| One to one Mentorship 24*7 | ✗ | ✓ |
| Mains Test Series (Sectional & Full Length Test) | ✗ | ✓ |
| Optional Gyan Bhandar | ✗ | ✓ |
| Weekly Doubt Clearing Sessions with Faculty | ✗ | ✓ |
| Validity | 18 Months | 30 Months |

# Schedule of the Classes and Tests

## Starting Few Classes will be at 11:00 AM

**7th January - Orientation**

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

**Sectional Test on Algebra**

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

**Sectional Test on Ordinary Differential Equation**

| Paper | Topic | Sub Topic |
| --- | --- | --- |
| Paper 1 | Vector Analysis | • Introduction to Vector Calculus<br>• Scalar & Vector fields<br>• Differentiation of Vector Field of Scalar variables<br>• Gradient & Vectors<br>• Divergence & Curl<br>• Higher Order derivatives, Vector identities<br>• Vector equation<br>• Curvature & Torsion<br>• Serret & Fernet's Formulae<br>• Gauss divergence theorem, Stokes theorem<br>• 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<br>• Constrained motion<br>• Work and energy, conservation of energy<br>• Kepler's laws, orbits under central forces.<br>• Equilibrium of a system of particles<br>• Work and potential energy, friction, Common catenary<br>• Principle of virtual work<br>• 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<br>• Groups 1<br>• Groups 2<br>• Sub groups, Normal groups<br>• Cosets<br>• Lagrange's theorem<br>• Homomorphism of groups<br>• Cyclic & Quotient groups<br>• Basic Isomorphism theorem<br>• Permutation groups<br>• Cayley's theorem<br>• Rings<br>• Subrings & Ideals<br>• Ideals & Homomorphism<br>• Euclidean Ring, Polynomial ring<br>• Integral domain, Principal ideal domain<br>• Euclidean domain, Unique factorization domain<br>• Finite & Quotient fields<br>• Sylow theorem |

**Sectional Test on Modern Algebra**

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

**Sectional Test on Real Analysis**

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

**Sectional Test on Complex Analysis**

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

**Sectional Test on Linear Programming Problem**

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

**Sectional Test on Partial Differential Equation**

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

**Sectional Test on Numerical Analysis & Computer Programming**

| Paper | Topic | Sub Topic |
| --- | --- | --- |
| Paper 2 | Mechanics & Fluid Dynamics | • Introduction to Fluid<br>• Euler's & Lagrange's equation<br>• Kinematics of Fluid flow<br>• Boundary condition<br>• Stream line flow, Path of particles<br>• Sources & Sinks<br>• Method of Images<br>• Axisymmetric flow<br>• Vortex flow 1<br>• Vortex flow 2<br>• Navier's – Stokes equation<br>• Introduction to Mechanics<br>• Moment of Inertia<br>• D Alembert's principle<br>• Generalized co-ordinates<br>• Lagrange's equation<br>• Hamilton equation<br>• 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<br>• Linear Dependence & Independence<br>• Sub Spaces & Bases<br>• Dimensions, Matrix of linear transformation<br>• Rank of Matrix<br>• Nullity<br>• Algebra of Matrices<br>• Row & Column reduction<br>• Echelon form, Rank of Matrices<br>• Types of Matrices<br>• Eigen values & Vectors<br>• Solution of System of Linear equations<br>• Characteristics Values & Vectors<br>• Caley Hamilton theorem<br>• Quadratic form |

**Sectional Test on Linear Algebra**

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

contact@studyiq.com