

# Master of Science (M.Sc.) – Mathematics — Common Syllabus

Duration: 2 years (4 semesters) | Evaluation: Theory exams, Assignments, Viva, Project/Dissertation

## Course Structure

- Duration: 2 years (4 semesters).
- Each semester includes 4–5 core papers and electives.
- Credits: Typically 3–4 per paper.
- Evaluation: Written exams, internal assessments, and dissertation/project work.

## Semester I — Suggested Papers

- Algebra – I (Groups, Rings, Fields)
- Real Analysis – I (Sequences, Series, Continuity, Differentiation)
- Topology – I (Metric and Topological Spaces)
- Ordinary Differential Equations – I
- Elective / Practical Component

## Semester II — Suggested Papers

- Algebra – II (Linear Algebra, Vector Spaces, Matrices)
- Real Analysis – II (Measure and Integration Theory)
- Complex Analysis – I (Analytic Functions, Cauchy's Theorem)
- Partial Differential Equations – I
- Numerical Analysis / Elective Paper

## Semester III — Suggested Papers

- Functional Analysis – I (Normed Spaces, Banach and Hilbert Spaces)
- Complex Analysis – II (Residue Theorem, Conformal Mapping)
- Differential Geometry / Mechanics
- Probability Theory and Stochastic Processes
- Elective Paper / Seminar / Project

## Semester IV — Suggested Papers

- Functional Analysis – II (Spectral Theory, Operators on Hilbert Spaces)
- Topology – II (Advanced Topology, Algebraic Topology)
- Numerical Methods and Scientific Computing
- Project / Dissertation / Viva Voce
- Elective Paper (Optimization, Mathematical Modeling, or Cryptography)

## **Electives (Indicative List)**

- Mathematical Modeling and Simulation
- Graph Theory and Combinatorics
- Operations Research and Optimization
- Advanced Numerical Methods
- Fluid Dynamics
- Cryptography and Coding Theory
- Computational Linear Algebra

## **Notes:**

- This syllabus is based on the UGC model curriculum and major Indian university syllabi for M.Sc. Mathematics.
- Each paper typically carries 100 marks, with 70% external and 30% internal evaluation.
- Students are required to complete a dissertation or project in the final semester.
- Laboratory and computational components may be integrated with theoretical courses.

Prepared by: ChatGPT — Common M.Sc. Mathematics Syllabus Template

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