



Centre for
Machine
Intelligence &
Data Science

MS by Research and PhD Admissions
2026-27

**SYLLABUS FOR
WRITTEN TEST**

MARCH, 2026

www.minds.iitb.ac.in



Test Structure

All eligible applicants for the MS by Research and PhD programs will have to undergo an online written test. The test will assess the applicant's foundations and knowledge in topics related to AI/ML.

The test (for both MS and PhD candidates) will be of **objective type only (i.e. Multiple-Choice-Qs and Fill-in-the-blanks)**.

Test Syllabus

The syllabus includes the following topics:

SUBJECT	TOPICS	REFERENCES
Calculus	Differentiation, Integration, Partial derivatives, Nested integration, Polar coordinates, etc.	<i>Calculus</i> , Gilbert Strang, 2nd edition (2010): Chapters 1-15. Companion web resource .
Linear algebra	Vectors, Linear equations, Vector spaces and subspaces, Orthogonality, Determinants, Eigenvalues and eigenvectors.	<i>Introduction to Linear Algebra</i> , Gilbert Strang, 3rd edition (2003): Chapters 1-6. Related web resource .
Probability	Basic probability, Random variables, Sampling, Parameter estimation, Regression.	<i>Introduction to Probability and Statistics for Engineers and Scientists</i> , Sheldon M. Ross, 5th edition (2014): Chapters 3, 4, 6, 7, 9.
Algorithms	Algorithms, Asymptotic notation, Divide and conquer, Sorting, Searching.	<i>Introduction to Algorithms</i> , Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, 3rd edition (2009): Chapters 1, 2, 3, 4, 6, 7, 12.
Machine Learning basics	Machine learning tasks, Overfitting, Parameter estimation, Gradient descent, etc.	<i>Deep Learning</i> , Ian Goodfellow, Yoshua Bengio, Aaron Courville, 2016: Chapter 5. On-line version .
Engineering core	Basic concepts from Civil, Chemical, Electrical, and Mechanical Engineering	Statics/dynamics, Mechanics of Materials, Materials science, Thermodynamics, Basic Electrical Engineering, Structures.

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