

SYLLABUS

Maths and Stats:

Linear algebra: Vectors, System of Linear equations, Vector Spaces and Subspaces, Orthogonality, Determinants, Projections, Eigenvalues and Eigenvectors, Singular Value Decomposition

Reading material:

- Introduction to Linear Algebra, Gilbert Strang, 3rd edition (2003): Chapters 1-6. Related web resource
- Linear Algebra Done Right, Sheldon Axler, 3rd edition (2015).

Probability and Statistics: Basic probability, Random variables, Sampling, Parameter estimation, Regression, Moments, distance measures, Probability Distributions, etc.

Reading material:

- A First Course in Probability, Sheldon M Ross, 9th edition (2013).

Optimization: Convex Sets, Convex Functions, Convex Optimization Problems, Optimality Conditions, first order methods

Reading material:

- Convex optimization, Stephen Boyd and Lieven and Vandenberghe, Cambridge University press, 2004, Chapters 1 to 4.

Data Structure and Algorithms: Algorithms, Asymptotic notation, Divide and conquer, Sorting, Searching.

Reading materials:

- Introduction to Algorithms, Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, 3rd edition (2009).
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Machine Learning: Machine learning tasks, Types of learning, Bias Variance Trade-off, Overfitting, Underfitting, etc.

Reading materials:

- Deep Learning, Ian Goodfellow, Yoshua Bengio, Aaron Courville, 2016, Chapter 5
- Probabilistic Machine Learning, Kevin Murphy, 2022.
- Pattern Recognition and Machine Learning, Christopher Bishop.

Programming.

Aptitude:

As GATE Syllabus