

[FUNDAMENTALS OF DATA SCIENCE]

Linear Algebra

Topics: Vectors, matrices, eigenvalues and eigenvectors, singular value decomposition.

3Blue1Brown's Essence of Linear Algebra

Data Science Math Skills by Duke University on Coursera

Calculus

Topics: Limits, derivatives, integrals, multivariable calculus.

3Blue1Brown's Essence of Calculus

MIT OpenCourseWare's Single Variable Calculus (18.01)

Probability

Topics: Probability theory, random variables, distributions, expectation, variance.

Khan Academy's Statistics and Probability

DataCamp's Introduction to Probability

Statistics

Topics: Descriptive statistics, inferential statistics, hypothesis testing, regression analysis.

Khan Academy's Statistics and Probability

Coursera's Statistics with Python Specialization by University of Michigan

Optimization

Topics: Gradient descent, convex optimization, Lagrange multipliers.

Coursera's Discrete Optimization by The University of Melbourne

Convex Optimization by Stephen Boyd (Stanford University)

[ADVANCE DATA SCIENCE :: FEW CONCEPTS]

Deep Learning

Topics: Neural networks, convolutional neural networks (CNNs), recurrent neural networks (RNNs), transfer learning.

Deep Learning Specialization by Andrew Ng on Coursera

Fast.ai's Practical Deep Learning for Coders

Natural Language Processing (NLP)

Topics: Text processing, word embeddings, language models, sequence-to-sequence models, transformers.

Natural Language Processing Specialization by DeepLearning.AI on Coursera

Hugging Face's NLP Course

Computer Vision

Topics: Image processing, object detection, image segmentation, image classification, generative models.

Convolutional Neural Networks by Andrew Ng on Coursera

PyImageSearch

Reinforcement Learning

Topics: Markov decision processes, Q-learning, policy gradients, deep reinforcement learning.

Reinforcement Learning Specialization by the University of Alberta on Coursera (covers foundational and advanced RL concepts)

Spinning Up in Deep RL by OpenAI (a practical introduction to deep reinforcement learning)

Machine Learning Interpretability and Ethics

Topics: Model explainability, fairness in machine learning, privacy, accountability.

Interpretable Machine Learning by Christoph Molnar (a book on interpretable machine learning)

Ethics and Data Science by Mike Loukides, Hilary Mason, and DJ Patil (a book on ethical considerations in data science)