Artificial Intelligence and Data Science Free Resources

Disclaimer: The topics need not be done in order

1. Foundations of Machine Learning

Courses

- [Machine Learning Specialization](#)
- [Essential Mathematics for Machine Learning – IITR – NPTEL](#)

Books

- [Deep Learning: Ian Goodfellow, Yoshua Bengio, and Aaron Courville](#)

2. Core Machine Learning Concepts

Courses

- [Stanford CS229](#)
- [MIT 6.036](#)

3. Data Science Fundamentals

Introduction to Data Science

- NumPy and Pandas
    - [Pandas Tutorials - YouTube](#)
    - [NumPy and Pandas Tutorial | Data Analysis With Python | Python Tutorial for Beginners | Simplilearn](#)

- [Data Analysis with Python Course - Numpy, Pandas, Data Visualization](#)
- Data Visualization
    - [Seaborn Is The Easier Matplotlib](#)
    - [Cufflinks Tutorial](#)
- Machine Learning with Scikit-Learn
    - [Real-World Python Machine Learning Tutorial w/ Scikit Learn (sklearn basics, NLP, classifiers, etc)](#)

4. Deep Learning

Courses

- [Neural Networks and Deep Learning](#)
- [Neural Networks: Zero to Hero](#)
- [Intro to Deep Learning](#)
- [But what is a neural network? | Chapter 1, Deep learning](#)
- [Deep Learning – IITKGP – NPTEL](#)
- [MIT 6.S191](#)

Key Topics

- [Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization](#)
- [Structuring Machine Learning Projects](#)
- [Convolutional Neural Networks](#)
- [Sequence Models](#)

5. Advanced Topics in Machine Learning

Transformers

- [Introduction - Hugging Face NLP Course](#)
- [But what is a GPT? Visual intro to transformers | Chapter 5, Deep Learning](#)

- Vision Transformer (ViT)
- BERT 101 - State Of The Art NLP Model Explained
- BERT

Generative AI

- What is Generative AI | Introduction to Generative AI | Generative AI Explained | Simplilearn
- Ultimate Generative AI Course 2024: Tools, Use Cases & Concepts (Free Course)

Large Language Models (LLMs)

- LLM2 Foundation Models from the Ground Up | Primer
- How might LLMs store facts | Chapter 7, Deep Learning
- Building LLMs | Stanford CS229

Foundation Models

- Foundation Models: An Explainer for Non-Experts
- What are Foundation Models? - Generative AI

6. Artificial Intelligence

- Harvard CS50's Artificial Intelligence with Python – Full University Course

7. Reinforcement Learning

- Introduction to Reinforcement Learning – Prof Balaraman Ravindran – NPTEL
- Stanford CS234 - Dr Emma Brunskill
- UCL Lectures on RL – Prof David Silver
- Deep Reinforcement Learning – HuggingFace

Additional Resources

Online Platforms

- [Kaggle Learn](#)
- [HuggingFace](#)

Youtube Channels

- Basic
    - [DeepLearningAI](#)
    - [Andrej Karpathy](#)
    - [GPT Learning Hub](#)
- Advanced, Interdomain
    - [Automated Reasoning - UCLA](#)
    - [Two Minute Papers](#)
    - [Eigen Steve - Physics Oriented](#)
    - [Computational Linguists UIUC](#)

Documentations

- [NumPy](#)
- [Pandas](#)
- [Matplotlib](#)
- [Seaborn](#)
- [Cufflinks](#)
- [Matplotlib](#)
- [Scikit-Learn](#)
- [PyTorch](#)
    - [learnpytorch.io](#)
    - [Playlist](#)
- [Tensorflow](#)
- [Gymnasium](#)
- [OpenAI Spinning Up in Deep RL](#)
- [OpenSpiel](#)
- [PettingZoo](#)