

structured roadmap to become a **Data Scientist** in 2025, with added **free resources** and **learning tools** for each section:

Roadmap to Become a Data Scientist or AI Engineer in 2025

1. Data Scientist Path

Key Skills to Master:

1. **Advanced Machine Learning**
 - a. Concepts: Transformers, self-supervised learning, time series forecasting
 - b. Learn for free: *Google Machine Learning Crash Course*, *fast.ai*
2. **AutoML & Model Tuning**
 - a. Tools: H2O.ai, Google AutoML, AutoKeras
 - b. Learn for free: H2O documentation, YouTube tutorials
3. **Data Visualization & Explainability**
 - a. Tools: Tableau Public, Power BI (free desktop), Plotly, SHAP, LIME
 - b. Learn for free: *Coursera - Data Visualization with Python (IBM)*
4. **Cloud Computing & GPUs**
 - a. Platforms: Google Colab, AWS Free Tier, Azure Free
 - b. Learn for free: *Google Cloud Skills Boost*, *AWS Skill Builder*
5. **Unstructured Data & Multimodal Learning**
 - a. Data types: Text, image, video
 - b. Tools: OpenCV, NLTK, Hugging Face Transformers
 - c. Learn for free: Hugging Face Course, OpenCV Docs
6. **Specialized Areas**
 - a. Federated Learning, XAI, Responsible AI, Synthetic Data
 - b. Learn for free: YouTube, research papers, GitHub repos

Top Tools & Platforms:

- ML Frameworks: TensorFlow, PyTorch, JAX, XGBoost
- BI Tools: Power BI, Tableau Public, Superset

- Data Platforms: Snowflake, Databricks Community, Spark (Databricks notebooks)