

12-Week Self-Study Roadmap: AI + Cloud (AWS-Specific)

A structured 12-week roadmap designed for self-paced learners aiming to build strong foundations in AI, Machine Learning, and AWS Cloud integration.

Week 1–2: Python & Data Handling

- Master Python for data analysis – focus on NumPy, Pandas, and Matplotlib.
- Understand data cleaning, transformation, and visualization.
- Mini Project: Analyze any public dataset using Pandas + Matplotlib.
- Resources: Kaggle Python course, freeCodeCamp Data Analysis.

Week 3–4: Core Machine Learning

- Learn Supervised & Unsupervised learning with Scikit-Learn.
- Understand regression, classification, and clustering.
- Mini Project: Build a simple house price predictor or spam classifier.
- Resources: Krish Naik's ML Playlist, Hands-On ML (Ch. 2–5).

Week 5–6: Model Evaluation & Feature Engineering

- Dive into feature scaling, encoding, and model evaluation metrics.
- Use GridSearchCV for hyperparameter tuning.
- Mini Project: Customer segmentation and model optimization.
- Resources: scikit-learn docs, StatQuest YouTube channel.

Week 7–8: Deep Learning with TensorFlow/Keras

- Understand neural networks, activation functions, and optimizers.
- Build CNNs for image classification and LSTMs for text data.
- Mini Project: Digit recognizer (MNIST) or sentiment analysis model.
- Resources: TensorFlow tutorials, CodeBasics Deep Learning series.

Week 9: AWS Fundamentals for AI/ML

- Learn core AWS services – EC2, S3, IAM, and Lambda.
- Understand how to host data, train, and deploy ML models on AWS.
- Resources: AWS Skill Builder (Free Courses) – Cloud Practitioner, S3 & EC2 Hands-on.

Week 10: AWS SageMaker for Machine Learning

- Introduction to SageMaker for model training and deployment.
- Practice creating, training, and deploying ML models using SageMaker notebooks.
- Mini Project: Deploy your trained scikit-learn model on SageMaker.
- Resources: AWS SageMaker documentation, YouTube: AWS ML Tutorials.

Week 11: MLOps & Automation

- Understand the basics of MLOps and CI/CD for ML.
- Learn how to use Docker for model containerization.
- Explore AWS CodePipeline or GitHub Actions for automated deployment.
- Mini Project: Automate deployment of a model API using Docker + AWS.

Week 12: Capstone Project & Portfolio

- Build a complete end-to-end ML project hosted on AWS.
- Examples: Image classifier hosted on S3 + SageMaker API.
- Document your project on GitHub and create a write-up on Notion/LinkedIn.
- Resources: Streamlit, Flask, and AWS Deployment Guides.

Tips for Success:

- Spend at least 1–2 hours daily or 10–12 hours weekly.
- Focus on hands-on projects – 70% practice, 30% theory.
- Keep all your projects on GitHub as a portfolio.
- Use AWS Free Tier for cloud experimentation.
- Follow creators like Krish Naik, CodeBasics, and AWS Educate for up-to-date tutorials.

By the end of 12 weeks, you'll be comfortable building, deploying, and managing AI/ML models on AWS — ready for real-world projects or internships.