

# Amazon SageMaker Studio for Data Scientists

AWS Classroom Training

## Course description

Amazon SageMaker Studio helps data scientists prepare, build, train, deploy, and monitor machine learning (ML) models quickly by bringing together a broad set of capabilities purpose-built for ML. This course prepares experienced data scientists to use the tools that are part of SageMaker Studio to improve productivity at every step of the ML lifecycle.

- Course level: Advanced
- Duration: 3 days

## Activities

This course includes presentations, demonstrations, practice labs, discussions, and a capstone project.

## Course objectives

In this course, you will learn to:

- Accelerate the preparation, building, training, deployment, and monitoring of ML solutions by using Amazon SageMaker Studio.

## Intended audience

This course is intended for:

- Experienced data scientists who are proficient in ML and deep learning fundamentals. Relevant experience includes using ML frameworks, Python programming, and the process of building, training, tuning, and deploying models.

## Prerequisites

We recommend that all students complete the following AWS course prior to attending this course:

- AWS Tech Essentials (1-day AWS instructor led course)

We recommend students who are not experienced data scientists complete the following two courses followed by 1-year on-the-job experience building models prior to taking this course:

- The Machine Learning Pipeline on AWS (4-day AWS instructor led course)
- Deep Learning on AWS (1-day AWS instructor led course)

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## Course outline

### Module 1: Amazon SageMaker Setup and Navigation

- Launch SageMaker Studio from the AWS Service Catalog.
- Navigate the SageMaker Studio UI.
- Demo 1: SageMaker UI Walkthrough
- Lab 1: Launch SageMaker Studio from AWS Service Catalog

### Module 2: Data Processing

- Use Amazon SageMaker Studio to collect, clean, visualize, analyze, and transform data.
- Set up a repeatable process for data processing.
- Use SageMaker to validate that collected data is ML ready.
- Detect bias in collected data and estimate baseline model accuracy.
- Lab 2: Analyze and Prepare Data Using SageMaker Data Wrangler
- Lab 3: Analyze and Prepare Data at Scale Using Amazon EMR
- Lab 4: Data Processing Using SageMaker Processing and the SageMaker Python SDK
- Lab 5: Feature Engineering Using SageMaker Feature Store

### Module 3: Model Development

- Use Amazon SageMaker Studio to develop, tune, and evaluate an ML model against business objectives and fairness and explainability best practices.
- Fine-tune ML models using automatic hyperparameter optimization capability.
- Use SageMaker Debugger to surface issues during model development.
- Demo 2: Autopilot
- Lab 6: Track Iterations of Training and Tuning Models Using SageMaker Experiments
- Lab 7: Analyze, Detect, and Set Alerts Using SageMaker Debugger
- Lab 8: Identify Bias Using SageMaker Clarify

### Module 4: Deployment and Inference

- Use Model Registry to create a model group; register, view, and manage model versions; modify model approval status; and deploy a model.
- Design and implement a deployment solution that meets inference use case requirements.
- Create, automate, and manage end-to-end ML workflows using Amazon SageMaker Pipelines.
- Lab 9: Inferencing with SageMaker Studio
- Lab 10: Using SageMaker Pipelines and the SageMaker Model Registry with SageMaker Studio

### Module 5: Monitoring

- Configure a SageMaker Model Monitor solution to detect issues and initiate alerts for changes in data quality, model quality, bias drift, and feature attribution (explainability) drift.
- Create a monitoring schedule with a predefined interval.

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- Demo 3: Model Monitoring

### Module 6: Managing SageMaker Studio Resources and Updates

- List resources that accrue charges.
- Recall when to shut down instances.
- Explain how to shut down instances, notebooks, terminals, and kernels.
- Understand the process to update SageMaker Studio.

### Capstone

- The Capstone lab will bring together the various capabilities of SageMaker Studio discussed in this course. Students will be given the opportunity to prepare, build, train, and deploy a model using a tabular dataset not seen in earlier labs. Students can choose among basic, intermediate, and advanced versions of the instructions.
- Capstone Lab: Build an End-to-End Tabular Data ML Project Using SageMaker Studio and the SageMaker Python SDK