



# Practical Data Science with Amazon SageMaker

Course ID #: 7000-423-ZZ-Z

Hours: 7

## Course Content

### Course Description:

In this intermediate-level course, individuals learn how to solve a real-world use case with Machine Learning (ML) and produce actionable results using Amazon SageMaker. This course walks through the stages of a typical data science process for Machine Learning from analyzing and visualizing a dataset to preparing the data, and feature engineering. Individuals will also learn practical aspects of model building, training, tuning, and deployment with Amazon SageMaker. Real life use cases include customer retention analysis to inform customer loyalty programs.

### At Course Completion:

After completing this course, student will be able to:

- Prepare a dataset for training
- Train and evaluate a Machine Learning model
- Automatically tune a Machine Learning model
- Prepare a Machine Learning model for production
- Think critically about Machine Learning model results

### Target Student:

- Developers
- Data Scientists

### Topics:

#### Module 1: Introduction to Machine Learning

- Types of ML
- Job Roles in ML
- Steps in the ML pipeline

#### Module 2: Introduction to Data Prep and SageMaker

- Training and Test dataset defined
- Introduction to SageMaker
- Demo: SageMaker console
- Demo: Launching a Jupyter notebook

#### Module 3: Problem formulation and Dataset Preparation

- Business Challenge: Customer churn
- Review Customer churn dataset

#### Module 4: Data Analysis and Visualization

- Demo: Loading and Visualizing your dataset
- Exercise 1: Relating features to target variables
- Exercise 2: Relationships between attributes
- Demo: Cleaning the data



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## Module 5: Training and Evaluating a Model

- Types of Algorithms
- XGBoost and SageMaker
- Demo 5: Training the data
- Exercise 3: Finishing the Estimator definition
- Exercise 4: Setting hyperparameters
- Exercise 5: Deploying the model
- Demo: Hyperparameter tuning with SageMaker
- Demo: Evaluating Model Performance

## Module 6: Automatically Tune a Model

- Automatic hyperparameter tuning with SageMaker
- Exercises 6-9: Tuning Jobs

## Module 7: Deployment / Production Readiness

- Deploying a model to an endpoint
- A/B deployment for testing
- Auto Scaling
- Demo: Configure and Test Autoscaling
- Demo: Check Hyperparameter tuning job
- Demo: AWS Autoscaling
- Exercise 10-11: Set up AWS Autoscaling

## Module 8: Relative Cost of Errors