

## Machine Learning Engineering on AWS

**Duration: 3 Days    Course Code: GK910029**

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### Overview:

Machine Learning (ML) Engineering on Amazon Web Services (AWS) is a 3-day intermediate course designed for ML professionals seeking to learn machine learning engineering on AWS. Participants learn to build, deploy, orchestrate, and operationalize ML solutions at scale through a balanced combination of theory, practical labs, and activities.

Participants will gain practical experience using AWS services such as Amazon SageMaker AI and analytics tools such as Amazon EMR to develop robust, scalable, and production-ready machine learning applications.

Course level: Intermediate

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### Target Audience:

This course is designed for professionals who are interested in building, deploying, and operationalizing machine learning models on AWS. This could include current and in-training machine learning engineers who might have little prior experience with AWS. Other roles that can benefit from this training are DevOps engineer, developer, and SysOps engineer.

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### Objectives:

- In this course, you will learn to do the following:
  - Explain ML fundamentals and its applications in the AWS Cloud.
  - Process, transform, and engineer data for ML tasks by using AWS services.
  - Select appropriate ML algorithms and modeling approaches based on problem requirements and model interpretability.
  - Design and implement scalable ML pipelines by using AWS services for model training, deployment, and orchestration.
  - Create automated continuous integration and delivery (CI/CD) pipelines for ML workflows.
  - Discuss appropriate security measures for ML resources on AWS.
  - Implement monitoring strategies for deployed ML models, including techniques for detecting data drift.
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### Prerequisites:

We recommend that attendees of this course have the following:

- Familiarity with basic machine learning concepts
  - Working knowledge of Python programming language and common data science libraries such as NumPy, Pandas, and Scikit-learn
  - Basic understanding of cloud computing concepts and familiarity with AWS
  - Experience with version control systems such as Git (beneficial but not required)
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## Content:

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|------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Day 1                                                      | Lab 2: Data Processing Using SageMaker Processing and the SageMaker Python SDK | Topic 8C: Choosing a model inference strategy                                                                |
| Module 0: Course Introduction                              | Day 2                                                                          | Topic 8D: Container and instance types for inference                                                         |
| Module 1: Introduction to Machine Learning (ML) on AWS     | Module 5: Choosing a Modeling Approach                                         | Lab 5: Shifting Traffic A/B                                                                                  |
| Topic 1A: Introduction to ML                               | Topic 5A: Amazon SageMaker AI built-in algorithms                              | Day 3                                                                                                        |
| Topic 1B: Amazon SageMaker AI                              | Topic 5B: Selecting built-in training algorithms                               | Module 9: Securing AWS Machine Learning (ML) Resources                                                       |
| Topic 1C: Responsible ML                                   | Topic 5C: Amazon SageMaker Autopilot                                           | Topic 9A: Access control                                                                                     |
| Module 2: Analyzing Machine Learning (ML) Challenges       | Topic 5D: Model selection considerations                                       | Topic 9B: Network access controls for ML resources                                                           |
| Topic 2A: Evaluating ML business challenges                | Topic 5E: ML cost considerations                                               | Topic 9C: Security considerations for CI/CD pipelines                                                        |
| Topic 2B: ML training approaches                           | Module 6: Training Machine Learning (ML) Models                                | Module 10: Machine Learning Operations (MLOps) and Automated Deployment                                      |
| Topic 2C: ML training algorithms                           | Topic 6A: Model training concepts                                              | Topic 10A: Introduction to MLOps                                                                             |
| Module 3: Data Processing for Machine Learning (ML)        | Topic 6B: Training models in Amazon SageMaker AI                               | Topic 10B: Automating testing in CI/CD pipelines                                                             |
| Topic 3A: Data preparation and types                       | Lab 3: Training a model with Amazon SageMaker AI                               | Topic 10C: Continuous delivery services                                                                      |
| Topic 3B: Exploratory data analysis                        | Module 7: Evaluating and Tuning Machine Learning (ML) models                   | Lab 6: Using Amazon SageMaker Pipelines and the Amazon SageMaker Model Registry with Amazon SageMaker Studio |
| Topic 3C: AWS storage options and choosing storage         | Topic 7A: Evaluating model performance                                         | Module 11: Monitoring Model Performance and Data Quality                                                     |
| Module 4: Data Transformation and Feature Engineering      | Topic 7B: Techniques to reduce training time                                   | Topic 11A: Detecting drift in ML models                                                                      |
| Topic 4A: Handling incorrect, duplicated, and missing data | Topic 7C: Hyperparameter tuning techniques                                     | Topic 11B: SageMaker Model Monitor                                                                           |
| Topic 4B: Feature engineering concepts                     | Lab 4: Model Tuning and Hyperparameter Optimization with Amazon SageMaker AI   | Topic 11C: Monitoring for data quality and model quality                                                     |
| Topic 4C: Feature selection techniques                     | Module 8: Model Deployment Strategies                                          | Topic 11D: Automated remediation and                                                                         |
| Topic 4D: AWS data transformation services                 | Topic 8A: Deployment considerations and target options                         |                                                                                                              |

Lab 1: Analyze and Prepare Data with Amazon SageMaker Data Wrangler and Amazon EMR

Topic 8B: Deployment strategies

troubleshooting

Lab 7: Monitoring a Model for Data Drift

Module 12: Course Wrap-up

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### Additional Information:

#### Activities

This course includes presentations, hands-on labs, demonstrations, and group exercises.

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### Further Information:

For More information, or to book your course, please call us on 00 971 4 446 4987

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