

# SAS Industry-Ready Bootcamp

SAS AI For Machine Learning Engineers

Total Duration: 148 Hours

Want to transition from traditional statistical modeling to the machine learning world. Knowledge of statistics relevant to machine learning will prepare you to become a data scientist. Learn to prepare, develop, compare, and deploy advanced analytics models to make better decisions on big data.

## Basic Qualifications:

**Final year/Graduate/Master's degree:** Final Year/Graduate/Master's Degree in computer science, data science, statistics, or a related field is advantageous.

### Pre-requisite:

- Before attending this course, participants should have at least an introductory-level familiarity with statistics and machine learning concepts
- Participants should be familiar with data mining concepts and predictive models

## Instructor-Led Content (90 Hours)

The Modeling Life Cycle for Data Scientists	
<ul style="list-style-type: none"> <li>• Introduction to Data Science                             <ul style="list-style-type: none"> <li>• Introductory concepts</li> <li>• Analytical Life cycle</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Unsupervised Models                             <ul style="list-style-type: none"> <li>• Introduction to unsupervised models</li> <li>• Hierarchical clustering</li> <li>• K-means clustering</li> <li>• Self-organizing maps</li> <li>• Market basket analysis</li> <li>• Path analysis</li> <li>• Network analysis</li> <li>• Text analytics</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Preparing the Data for Modeling                             <ul style="list-style-type: none"> <li>• Analytical challenges to predictive modeling</li> <li>• Feature engineering</li> </ul> </li> </ul>	
<ul style="list-style-type: none"> <li>• Supervised Models                             <ul style="list-style-type: none"> <li>• Introduction to supervised machine learning models</li> <li>• Regression</li> <li>• Decision trees</li> <li>• Neural networks</li> <li>• Support vector machines</li> <li>• Factorization machines</li> <li>• Ensemble models</li> <li>• Two-stage models</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Model Assessment                             <ul style="list-style-type: none"> <li>• Introduction to model assessment, model ops, and special topics</li> </ul> </li> </ul>

Statistics You Need to Know for Machine Learning	
<ul style="list-style-type: none"> <li>• Statistics and Machine Learning                             <ul style="list-style-type: none"> <li>• Relevance of statistics in big data and machine learning</li> <li>• Terminology and vocabulary</li> <li>• Introduction to SAS Viya and SAS Studio</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Predictive Modeling Using Logistic Regression                             <ul style="list-style-type: none"> <li>• Introduction to predictive modeling</li> <li>• Categorical associations</li> <li>• Logistic regression model</li> <li>• Model deployment</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Fundamental Statistical Concepts                             <ul style="list-style-type: none"> <li>• Introduction to statistical analysis</li> <li>• Descriptive statistics</li> <li>• Inferential statistics</li> </ul> </li> </ul>	

<ul style="list-style-type: none"> <li>• Explanatory Modeling Using Linear Regression <ul style="list-style-type: none"> <li>• Correlation and simple Linear regression</li> <li>• Multiple regression and model selection</li> <li>• Model diagnostics</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Statistical Foundations of Machine Learning <ul style="list-style-type: none"> <li>• Overview of machine Learning</li> <li>• Data pre-processing for machine Learning models</li> <li>• Model evaluation, estimation, and post-training tasks</li> </ul> </li> </ul>
<b>Machine Learning Using SAS Viya</b>	
<ul style="list-style-type: none"> <li>• Getting Started with Machine Learning and SAS Viya <ul style="list-style-type: none"> <li>• Machine Learning in business decision making</li> <li>• Supervised prediction: preparing the data and building the initial model</li> <li>• A closer Look at SAS Viya</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Neural Networks <ul style="list-style-type: none"> <li>• Building a default neural network model</li> <li>• Modifying the model: network architecture</li> <li>• Modifying the model: network Learning and optimization</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Data Preprocessing and Algorithm Selection <ul style="list-style-type: none"> <li>• Exploring the data and replacing incorrect values</li> <li>• Extracting features</li> <li>• Transforming inputs</li> <li>• Selecting features</li> <li>• Best practices in data preparation</li> <li>• Selecting an algorithm</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Support Vector Machines <ul style="list-style-type: none"> <li>• Building a default support vector machine model</li> <li>• Modifying the model: methods of solution</li> <li>• Modifying the model: kernel function</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Decision Trees and Ensembles of Trees <ul style="list-style-type: none"> <li>• Building a default decision tree model</li> <li>• Modifying the model: tree structure</li> <li>• Modifying the model: recursive partitioning</li> <li>• Modifying the model: pruning</li> <li>• Building and modifying ensembles of trees</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Model Assessment and Deployment <ul style="list-style-type: none"> <li>• Model assessment and comparison</li> <li>• Model deployment</li> </ul> </li> <li>• Additional Nodes <ul style="list-style-type: none"> <li>• Exploring additional nodes in Model Studio</li> </ul> </li> </ul>

<b>Managing Models in SAS Viya</b>	
<ul style="list-style-type: none"> <li>• Why Manage Models? <ul style="list-style-type: none"> <li>• The analytical Life cycle</li> <li>• Key user roles</li> <li>• Managed model Life cycle</li> <li>• Development operations pipeline</li> <li>• Model operations</li> <li>• Model operations environment</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Model Deployment <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Publishing models</li> <li>• Defining a CAS publishing destination</li> <li>• Scoring deployment</li> <li>• Creating a Model Performance report</li> <li>• Scheduling a performance job</li> <li>• Model retraining (self-study)</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Working with Projects and Models <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Project setup</li> <li>• Import models and model properties</li> <li>• Working with Python models</li> <li>• Working with R models</li> <li>• Evaluate models</li> <li>• Import, enable, and use a workflow</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Scoring SAS Visual Text Analytics Models (Self-Study) <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Scoring SAS Visual Text Analytics models</li> </ul> </li> </ul>

<b>ModelOps: Governing AI and Machine Learning</b>	
<ul style="list-style-type: none"> <li>• Introduction to ModelOps <ul style="list-style-type: none"> <li>• Introduction to ModelOps</li> <li>• Current state of models</li> <li>• Objectives of ModelOps</li> <li>• DevOps principles and values background</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Model Risk and Governance <ul style="list-style-type: none"> <li>• SAS Model Risk Management</li> </ul> </li> </ul>

- The Analytics Life Cycle

- A blueprint for ModelOps
- ModelOps initiation phase
- DataOps and model building
- The Register, Document, Validate, and Test phases
- Deploying models
- Monitoring performance


- SAS Container Runtime and Administration Concepts

- SAS Container Runtime
- SAS Model Manager administration concepts

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## Workshop and Self-Paced Learning (68 Hours)

In addition to the above mentioned duration, each track will have an additional module for you to learn at your own pace.

	<ul style="list-style-type: none"> <li>• <b>Data Literacy Essentials &amp; Practice</b> Learn what is data, what does it mean to be data literate, and why is it important in today's world?</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Generative AI Using SAS®</b> Learn about different types of GenAI and see examples of how SAS can enhance your efforts to make the most of these techniques</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>SAS Analytics getting Started</b> Learn the skills you need to acquire to use SAS Viya's functionality in the fields of Predictive Modeling, Time Series, Forecasting and Optimization.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Responsible Innovation and Trustworthy AI</b> This course focuses on foundational knowledge and skills to consider the issues related to responsible innovation and trustworthy AI</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>SAS® Programming for R Users</b> Learn to apply R skills in SAS Environment</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Modern Data Science with SAS Viya Workbench and Python</b> SAS Viya Workbench will help you explore how to access, transform, and analyze data from cloud object storage and data Lakehouses, then build machine learning models in both SAS and Python</li> </ul>

### Global Certification Mapping:

#### 1. Statistics You Need to Know for Machine Learning

**Global Certification:** SAS Certified Specialist: Statistics for Machine Learning

#### 2. Machine Learning Using SAS Viya

**Global Certification:** SAS Certified Specialist: Machine Learning Using SAS Viya

#### 3. Managing Models in SAS Viya + ModelOps: Governing AI and Machine Learning

**Global Certification:** SAS Certified ModelOps Specialist



84% said a SAS certification improved their performance and advanced their careers.

- Coursera Survey conducted by SAS, 2020



### Super Specialization for SAS AI For Machine Learning Engineers

Course Name	Prerequisite	Duration
<ul style="list-style-type: none"> <li>• Time series Modeling Essentials</li> <li>• Forecasting Using Model Studio in SAS Viya</li> </ul>	Statistics You Need to Know for Machine Learning	4 Days
<ul style="list-style-type: none"> <li>• SAS Viya and Python Integration for Machine Learning</li> </ul>	Experience writing Python programs for data analytics	1 Day
<ul style="list-style-type: none"> <li>• SAS Viya and R Integration for Machine Learning</li> </ul>	Experience writing R programs for data analytics	1 Day



#### Amazing Careers in Analytics

There's more than one path to the job you've always wanted. These stories of individual career journeys prove it.

## For Individual Learning & Training Partner Alliance Contact



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