CAIP - Certified Artificial Intelligence Practitioner Training

Duration: **5 Day**

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Equip yourself with vendor-neutral, cross-industry knowledge of Artificial Intelligence (AI) concepts and skills, enabling you to select, train, and implement Machine Learning solutions.

Artificial intelligence (AI) and machine learning (ML) have become essential parts of the toolset for many organizations. When used effectively, these tools provide actionable insights that drive critical decisions and enable organizations to create exciting, new, and innovative products and services. This course shows you how to apply various approaches and algorithms to solve business problems through AI and ML, all while following a methodical workflow for developing data-driven solutions.

Who Should Attend?

The skills covered in this course converge on four areas—software development, IT operations, applied math and statistics, and business analysis. Students for this course should be looking to build upon their knowledge of the data science process so that they can apply AI systems, particularly machine learning models, to business problems.

The target student is likely a data science practitioner, software developer, or business analyst looking to expand their knowledge of machine learning algorithms and how they can help create intelligent decision-making products that bring value to the business.

A typical student in this course should have several years of experience with computing technology, including some aptitude in computer programming.

This course is also designed to assist students in preparing for the CertNexus® Certified Artificial Intelligence (AI) Practitioner (Exam AIP-210) certification.

Prerequisites

To ensure your success in this course, you should be familiar with the concepts that are foundational to data science, including:

- The overall data science and machine learning process from end to end: formulating the problem; collecting and preparing data; analyzing data; engineering and preprocessing data; training, tuning, and evaluating a model; and finalizing a model.
- Statistical concepts such as sampling, hypothesis testing, probability distribution, randomness, etc.
- Summary statistics such as mean, median, mode, interquartile range (IQR), standard deviation, skewness, etc.
- Graphs, plots, charts, and other methods of visual data analysis.

You must also be comfortable writing code in the Python programming language, including the use of fundamental Python data science libraries like NumPy and pandas.

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What You Will Learn

In this course, you will develop AI solutions for business problems. You will:

- Solve a given business problem using AI and ML
- Prepare data for use in machine learning
- Train, evaluate, and tune a machine learning model
- Build linear regression models
- Build forecasting models
- Build classification models using logistic regression and k -nearest neighbor
- Build clustering models
- Build classification and regression models using decision trees and random forests
- Build classification and regression models using support-vector machines (SVMs)
- Build artificial neural networks for deep learning
- Put machine learning models into operation using automated processes
- Maintain machine learning pipelines and models while they are in production

Training Outline

Lesson 1: Solving Business Problems Using AI and ML

- Topic A: Identify AI and ML Solutions for Business Problems
- Topic B: Formulate a Machine Learning Problem
- Topic C: Select Approaches to Machine Learning

Lesson 2: Preparing Data

- Topic A: Collect Data
- Topic B: Transform Data
- Topic C: Engineer Features
- Topic D: Work with Unstructured Data

Lesson 3: Training, Evaluating, and Tuning a Machine Learning Model

- Topic A: Train a Machine Learning Model
- Topic B: Evaluate and Tune a Machine Learning Model

Lesson 4: Building Linear Regression Models

- Topic A: Build Regression Models Using Linear Algebra
- Topic B: Build Regularized Linear Regression Models
- Topic C: Build Iterative Linear Regression Models

Lesson 5: Building Forecasting Models

- Topic A: Build Univariate Time Series Models
- Topic B: Build Multivariate Time Series Models

Lesson 6: Building Classification Models Using Logistic Regression and k-Nearest Neighbor

- Topic A: Train Binary Classification Models Using Logistic Regression

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- Topic B: Train Binary Classification Models Using k-Nearest Neighbor
- Topic C: Train Multi-Class Classification Models
- Topic D: Evaluate Classification Models
- Topic E: Tune Classification Models

Lesson 7: Building Clustering Models

- Topic A: Build k-Means Clustering Models
- Topic B: Build Hierarchical Clustering Models

Lesson 8: Building Decision Trees and Random Forests

- Topic A: Build Decision Tree Models
- Topic B: Build Random Forest Models

Lesson 9: Building Support-Vector Machines

- Topic A: Build SVM Models for Classification
- Topic B: Build SVM Models for Regression

Lesson 10: Building Artificial Neural Networks

- Topic A: Build Multi-Layer Perceptrons (MLP)
- Topic B: Build Convolutional Neural Networks (CNN)
- Topic C: Build Recurrent Neural Networks (RNN)

Lesson 11: Operationalizing Machine Learning Models

- Topic A: Deploy Machine Learning Models
- Topic B: Automate the Machine Learning Process with MLOps
- Topic C: Integrate Models into Machine Learning Systems

Lesson 12: Maintaining Machine Learning Operations

- Topic A: Secure Machine Learning Pipelines
- Topic B: Maintain Models in Production

Appendix A: Mapping Course Content to CertNexus® Certified Artificial Intelligence (AI) Practitioner (Exam AIP-210)

Appendix B: Datasets Used in This Course