

## **20774 A: Perform Cloud Data Science with Azure Machine Learning**

### **Course Outline**

#### **Module 1: Introduction to Machine Learning**

This module introduces machine learning and discussed how algorithms and languages are used.

##### Lessons

- What is machine learning?
- Introduction to machine learning algorithms
- Introduction to machine learning languages

##### Lab : Introduction to machine Learning

- Sign up for Azure machine learning studio account
- View a simple experiment from gallery
- Evaluate an experiment

#### **Module 2: Introduction to Azure Machine Learning**

Describe the purpose of Azure Machine Learning, and list the main features of Azure Machine Learning Studio.

##### Lessons

- Azure machine learning overview
- Introduction to Azure machine learning studio
- Developing and hosting Azure machine learning applications

##### Lab : Introduction to Azure machine learning

- Explore the Azure machine learning studio workspace
- Clone and run a simple experiment
- Clone an experiment, make some simple changes, and run the experiment

#### **Module 3: Managing Datasets**

At the end of this module the student will be able to upload and explore various types of data in Azure machine learning.

##### Lessons

- Categorizing your data
- Importing data to Azure machine learning

- Exploring and transforming data in Azure machine learning

#### Lab : Managing Datasets

- Prepare Azure SQL database
- Import data
- Visualize data
- Summarize data

### **Module 4: Preparing Data for use with Azure Machine Learning**

This module provides techniques to prepare datasets for use with Azure machine learning.

#### Lessons

- Data pre-processing
- Handling incomplete datasets

#### Lab : Preparing data for use with Azure machine learning

- Explore some data using Power BI
- Clean the data

### **Module 5: Using Feature Engineering and Selection**

This module describes how to explore and use feature engineering and selection techniques on datasets that are to be used with Azure machine learning.

#### Lessons

- Using feature engineering
- Using feature selection

#### Lab : Using feature engineering and selection

- Prepare datasets
- Use Join to Merge data

### **Module 6: Building Azure Machine Learning Models**

This module describes how to use regression algorithms and neural networks with Azure machine learning.

#### Lessons

- Azure machine learning workflows
- Scoring and evaluating models

- Using regression algorithms
- Using neural networks

Lab : Building Azure machine learning models

- Using Azure machine learning studio modules for regression
- Create and run a neural-network based application

### **Module 7: Using Classification and Clustering with Azure machine learning models**

This module describes how to use classification and clustering algorithms with Azure machine learning.

Lessons

- Using classification algorithms
- Clustering techniques
- Selecting algorithms

Lab : Using classification and clustering with Azure machine learning models

- Using Azure machine learning studio modules for classification.
- Add k-means section to an experiment
- Add PCA for anomaly detection.
- Evaluate the models

### **Module 8: Using R and Python with Azure Machine Learning**

This module describes how to use R and Python with azure machine learning and choose when to use a particular language.

Lessons

- Using R
- Using Python
- Incorporating R and Python into Machine Learning experiments

Lab : Using R and Python with Azure machine learning

- Exploring data using R
- Analyzing data using Python

## **Module 9: Initializing and Optimizing Machine Learning Models**

This module describes how to use hyper-parameters and multiple algorithms and models, and be able to score and evaluate models.

### Lessons

- Using hyper-parameters
- Using multiple algorithms and models
- Scoring and evaluating Models

Lab : Initializing and optimizing machine learning models

- Using hyper-parameters

## **Module 10: Using Azure Machine Learning Models**

This module explores how to provide end users with Azure machine learning services, and how to share data generated from Azure machine learning models.

### Lessons

- Deploying and publishing models
- Consuming Experiments

Lab : Using Azure machine learning models

- Deploy machine learning models
- Consume a published model

## **Module 11: Using Cognitive Services**

This module introduces the cognitive services APIs for text and image processing to create a recommendation application, and describes the use of neural networks with Azure machine learning.

### Lessons

- Cognitive services overview
- Processing language
- Processing images and video
- Recommending products

Lab : Using Cognitive Services

- Build a language application
- Build a face detection application

- Build a recommendation application

### **Module 12: Using Machine Learning with HDInsight**

This module describes how use HDInsight with Azure machine learning.

Lessons

- Introduction to HDInsight
- HDInsight cluster types
- HDInsight and machine learning models

Lab : Machine Learning with HDInsight

- Provision an HDInsight cluster
- Use the HDInsight cluster with MapReduce and Spark

### **Module 13: Using R Services with Machine Learning**

This module describes how to use R and R server with Azure machine learning, and explain how to deploy and configure SQL Server and support R services.

Lessons

- R and R server overview
- Using R server with machine learning
- Using R with SQL Server