

Virginia Western Community College

ITD 140

Machine Learning I

Prerequisites

None

VCCS Course Description

Introduces students to artificial intelligence and machine learning. Examines basic theory, algorithms, and applications. Focuses on feature engineering and machine learning applications within the larger world of artificial intelligence. Part I of II.

Semester Credits: 3

Lecture Hours: 3

Required Materials

Textbook

None

Other Required Materials:

CompTIA AI Essentials ISBN: 978-1-64274-550-4

VCCS COURSE OUTCOMES

At the completion of this course, the student should be able to:

Describe and identify basic artificial intelligence approaches.

Identify and explain basic types of machine learning algorithms for both supervised and unsupervised machine learning.

Machine Learning

- Define and explain the purpose of machine learning

- Define and explain the purpose of artificial neural networks

Describe and differentiate between supervised and unsupervised learning techniques.

Supervised Learning

- Define and explain the purpose of supervised learning

- Identify supervised learning algorithms and when they should be used

- Define, explain and perform linear and multivariate regressions

- Define classification as a supervised learning prediction task

- Discuss when it is appropriate to use classification

- Apply classification on a dataset

Define, explain and apply decision tree learning

Neural Networks

Unsupervised Learning

Define and explain the purpose of unsupervised learning

Identify unsupervised learning algorithms and when they should be used

Clustering

Describe and apply basic dimensionality reduction

Describe and apply feature extraction and engineering techniques.

Feature Engineering

Define Feature Engineering, Imputation

Define and explain the purpose of cold- and hot-deck imputation

Define and apply mean substitution

Define raw features

Define and explain how to create derived features, and define:

Create and use numerical data

Define a qualitative variable as it applies to machine learning

Define a quantitative variable as it applies to machine learning

Define, create and use categorical data

Define, explain and apply one-hot encoding

Define and perform simple feature scaling

Define and perform normalization

Define and apply min-max scaling

Define loss functions

Note to Instructors

None

TOPICAL DESCRIPTIONS

- Overview of artificial intelligence approaches
- Supervised learning with example implementations
- Unsupervised learning with example implementations
- Feature extraction and engineering

[TITLE IX STATEMENT](#)

[ADA STATEMENT](#)