## Course Description

Machine learning techniques are introduced including algorithms for implementing various stages of a machine learning system. Various stages include preprocessing, classification, clustering, regression analysis, and post processing. These stages can be implemented using statistical methods, non-parametric methods, neural networks, fuzzy inference systems, fuzzy neural systems.

## Class Time

This class is offered asynchronously online. While you control when you watch videos and work on assignments, be aware of course pacing and specific deadlines.

## Instructor Information

Dr. Robert P. Schumaker
Professor, Computer Science Dept.
rschumaker@uttyler.edu

## Office Hours

DM through Slack (preferred), Zoom, email
    If your inquiry is grade-related, please make a Zoom or physical appointment

## Textbook Information

Machine Learning with R (Lantz)
ISBN: 978-1-78829-586-4

## Course Objective

This course is designed with the following goals:

- Identify methods for data cleaning, replacing missing data, and normalization
- Develop models for supervised classification using discriminant functions, neural networks and fuzzy logic systems
- Develop clustering models using K-means clustering, neural networks and fuzzy logic systems
- Develop software to analyze data using decision trees

## Computer Account Access

Students will need a Patriot account and password for computer access. This information can be found at https://www.uttyler.edu/ccs

## Course Documents and Slides

This class will use Canvas for course documents, slides, quizzes and other class-related materials. Students are encouraged to check the website frequently during the course of the semester to keep up to date about course activity.

## Course Grading

Course evaluation will be based on the following:

| | |
|---|---|
| Quizzes (6 @ 20 points each, drop 1) | 100 |
| Total Points | 100 |

## Grading Scale

| | |
|---|---|
| A | 85.0 points or more |
| B | 70.0 to 84.999 points |
| C | 55.0 to 69.999 points |
| D | 40.0 to 54.999 points |
| F | 39.999 points or less |

## Course Policies

1. Quizzes – Quizzes will be given throughout the course and will test the student's mastery of the material. Missed quizzes cannot be made up without acceptable emergency-related documentation. The lowest quiz will be dropped.

## Tentative Course Schedule and Assignments

| Date | Concept | Readings | Quizzes |
|---|---|---|---|
| Aug 26-Sep 1 | Introduction to Machine Learning | Ch 1 | |
| | Introduction to R | Ch 2 | |
| Sep 2-8 | Clean and Analyze Data | | |
| | Clustering and kNN | Ch 3, 9 | Q1 |
| Sep 9-15 | Decision Trees | Ch 5 | |
| | Naive Bayes | Ch 4 | Q2 |
| Sep 16-22 | Linear Regression | Ch 6 | |
| | Polynomial and Multiple Regression | | Q3 |
| Sep 23-29 | Genetic Algorithms | | |
| | Neural Networks | Ch 7 | Q4 |
| Sep 30-Oct 6 | Support Vector Machines | | |
| | Market Basket Analysis | Ch 8 | Q5 |
| Oct 7-11 | Text Analytics | | |
| | Evaluating Models | Ch 10 | Q6 |