

Machine Learning Syllabus

1. Instructor contact information:

Instructor Name: Read Alharbi

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2. *Course Objectives*

Understand and utilize the concepts of machine learning for data science. Focus on tools for multivariate data analysis and how to handle uncertain data with probability models.

Upon completion of this course, the student will be able to:

- Identify relevant real-world problems as instances of canonical machine learning problems
- Design and implement effective strategies for data preprocessing
- Explain and utilize concepts of machine learning for data science and electrical engineering
- Compare and contrast evaluation metrics
- Foresee and mitigate human-based liabilities of machine learning algorithms
- General level of competency in critical questioning and analysis
- Students will know how to make connections between different fields of machine learning

3. *Required Software:*

A laptop with Python 3.4.3 or later and [Anaconda](#) installed will be required.

4. *Course Schedule:*

Introduction to some mathematical terms needed in machine learning.

Introduction to Machine Learning problems and methods

Linear Regression & Generalization

Implementation of Linear Regression from scratch using mathematical equations.

Maximum Likelihood, Maximum A-Posteriori, Regularization and Bayesian Prior

Implementation of MLE and MAP from scratch.

Equivalence Probabilistic Generative Models.

Implementation of specific Probabilistic Generative Model from scratch.

Gaussian Mixture Models

Non-parametric approaches; K-means and K-Nearest Neighbors.

Implementation of K-mean and K-Nearest Neighbors from scratch.

Curse of Dimensionality

Principal Components Analysis
Manifold Learning; Multidimensional Scaling and ISOMAP.
Implementation of PCA, MDS and ISOMAP from scratch.

5. Common Questions:

- Where can I post my questions regarding any lesson?

Using our website: www.akadyma.com then post your question in the discussion board for the course, and answer to your question will be post within 48 hours. Another way is to mention the organization account in twitter regarding short questions: akadymatech

- Why I should ask questions in the website discussion board rather than the YouTube comments?

The YouTube comments are not suitable for explanations, show reasoning and discussion different point of view of the issue. In addition, the communication will be much easier with your college in the course to discuss issues together.

- Can we have online meeting with instructor to ask questions?

Yes, online discussion will be organized using zoom meeting. Pay attention to the twitter account for that. Twitter account: akadymatech

- How can I learn successfully machine learning using this course?

Understand the theory part behind the concept and then implement the lessons as you are going to see in the course before jumping to new topic

- Why this course is different other than online courses on the internet?

Our course was designed by professional in the field. The learning process used in this course is by understanding concept and then immediately implement that concept from scratch to get deep understanding of terms.

- What kind of implementation used in this course?

All tasks will be implemented using real example projects.