**CENG463 Introduction to Machine Learning**

**Instructor:** Asst. Prof. Dr. Selma TEKİR

**E-mail, Phone:** [selmatekir@iyte.edu.tr](mailto:selmatekir@iyte.edu.tr), (232) 750 7886

**Assistants:** MSc. Erhan Sezerer, Ozan Polatbilek

**Office Hours:** TBD

# Lecture Notes:

There will be lecture notes as slides posted on the University’s Course Management System (http://cms.iyte.edu.tr). They will be posted every week as the course progresses. You are responsible from the material and exercises given there.

# Reference Books:

There is no textbook. There are several books that you can consult:

* + Christopher Bishop, Pattern Recognition and Machine Learning. Springer, 2006.(L,D)
  + Yoav Goldberg, Neural Network Methods in Natural Language Processing. Morgan & Claypool Publishers, 2017.
  + Ethem Alpaydın, Introduction to Machine Learning (2nd Edition). MIT Press, 2010.
    - Ethem Alpaydın, Yapay Öğrenme (Turkish edition of the book) Boğaziçi University Press, April 2011.(H)
  + Richard Duda, Peter Hart and David Stork, Pattern Classification, 2nd ed. John Wiley & Sons, 2001. (L)
  + Tom Mitchell, Machine Learning. McGraw-Hill, 1997.(L)

# Assignments:

There will be coding assignments. You are expected to complete them in **Python** and to submit a ‘working code’.

# Exams:

One midterm and one final exam will be conducted.

# Cheating, Plagiarism, etc.:

You’re expected to solve the questions in the assignments and exams **individually**. Do not copy others' assignments. The more you rely on others to complete or to correct your assignments, the worse you do in the exams. Any copying of assignments and answers in the exam will be penalised according to the university policy.

# Grading:

Midterm 30%, Final 40%, Assignments 30%

# (Tentative) Weekly Schedule

1. Introduction
2. Bayesian Decision Theory
3. Gaussian Distributions and Maximum Likelihood Estimation
4. Linear Regression (also with multiple variables)
5. Logistic Regression
6. Non-parametric Classification Approaches
7. Model Selection Procedures, Tuning Model Complexity, High Bias, High Variance, Experiment Design
8. Dimensionality Reduction and Principal Component Analysis
9. Summary and Examination
10. Parametric Clustering
11. Non-parametric Clustering: Hierarchical Approach
12. Support Vector Machines
13. Neural Networks-I
14. Neural Networks-II