

**MIDDLE EAST TECHNICAL UNIVERSITY
DEPT. OF COMPUTER ENGINEERING**

**CENG 574 STATISTICAL DATA ANALYSIS
Fall 2021**

Instructor Volkan Atalay
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Class Thursday 9:40-12:30 BMB-4 (*in-class*)
Office Hour Tuesday 14:40-15:40 (*office and online, by appointment only*)

Course web page address <http://blog.metu.edu.tr/vatalay/ceng-574-statistical-data-analysis/>

Course Objectives

The objective of this course is to introduce the concepts and techniques of clustering and multivariate and exploratory data analysis. This course offers an opportunity to perform data analysis by using data visualization, projection, and embedding.

Prerequisites Knowledge of programming, probability and linear algebra.

Main Reference Book

E. Alpaydın, *Introduction to Machine Learning*, 2nd Edition (2010) or 3rd Edition (2014), The MIT Press.
(Yapay Öğrenme, Turkish language edition, translated by the author, Boğaziçi Üniversitesi Yayınevi, 1st Edition 2011, 2nd Edition 2013, 3rd edition 2017)

Course Topics

1. Data representation, distance metrics and similarity measures
2. Linear and non-linear data projection methods, data embedding methods
3. Data clustering algorithms and methods
4. Evaluation of clustering algorithms and validation of clusterings
5. Applications of data clustering in various fields such as bioinformatics and data stream analysis

Grading

Assignment #1, #2, #3	2pts each	6
Assignment #4, #5, #6	10pts each	30
Assignment #7	6pts each	6
Report (paper) submission and presentation		18
Midterm		30
Attendance and class participation		10

Notes and Remarks

The students should prove to have been fully vaccinated or regularly tested against Covid-19 to participate in class.

The students should wear a mask at all times during the class.

The students should provide their own HES codes to the instructor and to the teaching assistant.

Assignments should be done on individual basis.

Dataset Analysis will be performed in a team setting of 2 persons.

R programming language will be used for the applied part of this course.

Late submission policy: You have a total of 4 days of late submission.

Academic Integrity Guide for Students:

<http://oidb.metu.edu.tr/system/files/Academic%20Integrity%20Guide%20for%20Students.pdf>