ADA University
School of Business

1. Course Information

- DNSC 3603, Data Science, 6 credits
- Spring Semester 2025, Tuesday-Thursday 10:00-11:15
- Instructor Name and E-mail: Professor of Information Systems Hulisi Ogut, hogut@ada.edu.az
- Office , Office Hours and Phone: D313, Tuesdays 11:30-12:30,489
- Position in curriculum: Technical Elective for 4th year Bachelor of Science in Finance (BSF) students.
- Pre-requisite:

2. Course Description

This course covers modern statistical and machine learning methods for working with small and big data. Some of major topics in this class are classification, regression, forecasting, clustering and dimensionality reduction techniques. The Python programming language will also be used to teach the essential skills for data wrangling, application and deployment of techniques.

3. Course Learning objectives

2.

#	Course Objective	Assessment	Contributes to Program Objectives
1	To appreciate the enhanced data rich environment of today's global economy and get exposed to the related business intelligence service opportunities that exist.	Homeworks, Midterm and Final Exam	Apply quantitative reasoning skills to make data-driven business decisions.

2	To provide a practical understanding of the key methods of classification, prediction, reduction and exploration that are at the heart of data science. To decide when to use which technique.	Homeworks, Midterm and Final Exam	Apply quantitative reasoning skills to make data-driven business decisions.
3	To implement major techniques using software and become smart/skeptical consumers of statistical techniques.	Homeworks, Midterm and Final Exam	Apply quantitative reasoning skills to make data-driven business decisions.
4	Solve a data driven problem by analyzing data science tools and making data-driven business decisions.	Homeworks, Midterm and Final Exam	Apply quantitative reasoning skills to make data-driven business decisions.

4. Course Literature

Kaggle Courses https://www.kaggle.com/learn/python
https://www.kaggle.com/learn/pandas
https://www.kaggle.com/learn/intro-to-machine-learning
https://www.kaggle.com/learn/intermediate-machinelearning
https://www.kaggle.com/learn/time-series
https://www.kaggle.com/learn/feature-engineering
https://www.kaggle.com/learn/data-cleaning

Aurélien Géron, Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems. 3rd Edition.

Data Mining for Business Intelligence: Concepts, Techniques, and Applications in Python
https://www.dataminingbook.com/book/python-edition

Rob J Hyndman and G. Athanasopoulos, Forecasting Principles and Practice (3rd ed),
https://otexts.com/fpp3/

5. Assessment

HomeWorks and Cases: 25%
Midterm Exam :32%
Final Exam :40%
Attendance: 3%

If homework submission is late, 5% will be deducted from the homework grade for each day.
makeup exam will be given only If medical documents are provided,

6. Grading Scale

The following scale will be used for assessing your work, as outlined by ADA BA Regulations. Your
final course grade is the sum of the points you score on each of the assignments (grading components)
multiplied by their relative weight.

Letter grade	%	Description
A	94 – 100%	Excellent to outstanding performance
A -	90 – 93%	Excellent performance in most respect
B +	87 – 89%	Very good performance
B	83 – 86%	Good performance
B -	80 – 82%	Good performance overall, but with some weaknesses
C +	77 – 79%	Satisfactory to good performance
C	73 – 76%	Satisfactory performance
C -	70 - 72%	Adequate evidence of learning
D +	67 - 69 %	Evidence of learning

D	60- 66 %	Some evidence of learning	
F	0 - 59%	Poor performance	

7. Tentative Course Schedule

Week	Chapter	Subjects	Books
1		Course Introduction+ Python Tutorial	Lecture Notes
2		Data Processing and Data Wrangling	Lecture Notes
3		Linear Regression and Regularization Techniques	Lecture Notes
4		Bias and Variance Tradeoff, Decision Trees +Bagging (Random Forest)	Lecture Notes
5		Boosting Techniques (XGBoost+CatBoost+ LightGBM) for classification and classification metrics	Lecture Notes
6		Boosting Techniques for Regression and Parameter Optimization	Lecture Notes
7		Other Classification and Regression Techniques (Logistic Regression, kNN, Naive Bayes)	Lecture Notes
8		Review+ Midterm	Lecture Notes
9		Other Classification and Regression Techniques (SVM, Neural Network)	
10		AutoML Tools (AutoGluon and PyCaret)	

11		PCA+ Data Reduction Techniques	Lecture Notes
12		Clustering+ Segmentation	Lecture Notes
13		Forecasting using Univariate Data	Lecture Notes
14		Forecasting (ARIMA, SARIMA and other techniques for multivariate data)	Lecture Notes
15		Review	

8. Student Code of Ethics

All students are required to uphold and embody the requirements and principles stated in the ADA Honor Code. You are responsible for reading the Honor Code in detail and obey it at all times during the course of your studies at ADA, as it is an institutional document which applies to all classes and other activities at ADA University.

9. Github Site of Class Material https://github.com/ogut77/DataScience