

Course name: CENG463 Introduction to Machine Learning		Department: Computer Engineering						
Semester	Methods of Education							Credit (ECTS) 5
	Lecture hour	Recitation/ (Etud)	Lab (Online)	Project/ Field Study	Homework	Other	Total	
2021 – 2022 Fall	28	-	14	25	65	18	150	
Language	English							
Compulsory/Elective	E							
Prerequisites	-							
Face to Face Lecture	2							
Online	1							
Course Contents	<p>Week 1 – Brief Overview of Machine Learning and Scikit-Learn</p> <p>Week 2 – Non-parametric Methods (Non-parametric density estimation, Nearest neighbor method)</p> <p>Week 3 – Probabilistic Classifiers (Bayes classifier, Naive Bayes)</p> <p>Week 4 – Performance Metrics and Model Selection</p> <p>Week 5 – Linear Regression</p> <p>Week 6 – Polynomial Regression</p> <p>Week 7 – Regularized Linear Models (Ridge, LASSO)</p> <p>Week 8 – Logistic Regression & Discriminant Analysis</p> <p>Week 9 – Support Vector Machines (Support vector classifier, Kernels)</p> <p>Week 10 – Decision Trees (ID3, C4.5, C5.0, CART)</p> <p>Week 11 – Ensemble Learning (Bagging, Boosting, Random forests)</p> <p>Week 12 – Multi-class Classification (Linear & Logistic regression, k-NN, Naive Bayes, Decision trees)</p> <p>Week 13 – Dimensionality Reduction (PCA, Kernel PCA, Manifold learning)</p> <p>Week 14 – Unsupervised Learning Techniques (Clustering, Mixture of Gaussians)</p> <p>Week 15 – Review</p>							
Course Objectives	This course aims to teach machine learning methods and foundations.							
Learning Outcomes and Competences	Lectures will include supervised learning (classification, regression, inference) and unsupervised learning (clustering).							
Textbook and /or References	"Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems", Aurélien Géron, O'Reilly Media (2019).							
Assessment Criteria							%	
	Homework						40	
	Project						30	
	Final						30	
Instructors	Dr. Fatih Nar							