

SUBJECT TO CHANGE		CS 412 Machine Learning		
Instructor	Name	Reyyan Yeniterzi		
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	Office Hours	Please send an email to meet. Zoom Room: https://sabanciuniv.zoom.us/my/reyyan		
Time and Place	Lecture Hours	Wednesdays 16:40 -17:30 Zoom Thursdays 11:40 -13:30 Zoom		
	Recitation Hours	Fridays 12:40-14:30 Zoom		
Course Materials	Mandatory	-		
	Recommended	Ethem Alpaydın, Introduction to Machine Learning, 2e. The MIT Press, 2010. (online available at the IC) Tom Mitchell, Machine Learning, McGraw Hill, 1997. Christopher M. Bishop, Pattern Recognition and Machine Learning, Springer, 2011 (most comprehensive)		
Weekly Subjects	Week	Dates	Subject	
	1	24.02-25.02.2021	Introduction to Machine Learning, Machine Learning Concepts	
	2	03.03-04.03.2021	Decision Trees	
	3	10.03-11.03.2021	Nearest Neighbour Classifier	
	4	17.03-18.03.2021	Probability Review, MLE and MAP	
	5	24.03-25.03.2021	Bayesian Approaches	
	6	31.03-01.04.2021	Linear Regression	
	7	07.04-08.04.2021 (Withdrawal Period)	Linear and Logistic Regression	
	8	14.04-15.04.2021 (Withdrawal Period)	Bias and Variance, Preventing Overfitting	
	9	21.04-22.04.2021 (Withdrawal Period)	Performance Metrics	
	10	28.04-29.04.2021 (Withdrawal Period)	Neural Networks	
	11	05.05-06.05.2021	Deep Learning	
	12	12.05-13.05.2021 (Ramazan Feast)	Holiday - No Class	
	13	19.05-20.05.2021 (Commemoration of Atatürk, Youth and Sports Day)	Support Vector Machines	
	14	26.05-27.05.2021	Classifier Combination	
Assessment Methods	Type	Weight	Implementation Rule	Make-Up Rule
	Final Exam	35	Exam will be closed books and notes. It will be either online or in-person depending on the situation at the time. If we do an online exam we will apply the rules in the exam guideline. Please read it. For proctored exams, your webcam and microphone should be on during the exam. In the case of non-compliance	If you miss the final there will be a make up. Make up exam can be an oral exam.

			with this and other declared exam procedures, your exam will be void. Make sure to check that your webcam and microphone function properly before the exam. After the exam, some people can be chosen randomly for an oral exam with additional questions.	
	Quiz	30	Two short quizzes (15% each) will be performed during the lecture hours. These quizzes will be announced in advance. The same exam rules will be applied.	• If you miss one quiz, you can either ask for an oral make up or your total quiz grade will be calculated by multiplying the other quiz grade by 1.5. • If you miss two of them, an oral exam will be applied which will replace one of the missed quiz, there won't be a make up for the other one.
	Attendance	5	Attendance based on zoom attendance. You must attend the synchronous Zoom lectures, recitations, etc. and real-time online exams with your SU email account. Otherwise your attendance won't be counted.	No penalty will be applied if you miss two lectures. No make up for missed attendance.
	Take Home Exam - Individual	20	Four-five take home exams in total. Some of them will be written and some programming. These will be solved individually. Copying the work of others or from other sources is not permitted. Such a case will result in score -100.	In some exams late submissions are not accepted. In others late submission will be accepted with penalty. These description will be announced together with the exam description.
	Take Home Exam - Group	10	The purpose of this take home exam is to get hands on practical experience. You will work groups of four people. Copying the work of others or from other sources is not permitted. Such a case will result in score -100.	Late submissions are not accepted with penalty.
	TOTAL	100%		
Determining Letter Grade	• Final exam, take home exams will be counted for the last letter grade. • Letter grades will be assigned based on curve, considering the distribution of the grades in the class • Any one of the followings lead to failing the course: (1) overall total grade below 35 (over 100) (2) final exam grade below 30 (over 100)			
Other	Learning Objectives	• Understand the basic concepts, issues, assumptions and limitations in machine learning (e.g. overfitting, error measures, curse of dimensionality...).		

	• Have a working knowledge of the basic mathematics (probability, expectation, entropy, basic linear algebra, ...) and algorithms behind common machine learning techniques; together with their suitability in given situations. • Given a machine learning problem, be able to implement and evaluate one of the standard machine learning algorithms (e.g. decision trees, neural networks, SVMs) using Python.
Learning Outcomes	• Have a working knowledge of the basic mathematics (probability, expectation, entropy, basic linear algebra, ...) and algorithms behind common machine learning techniques; together with their suitability in given situations. • Have a solid understanding of the basic concepts, issues, assumptions and limitations in machine learning and how they apply to various machine learning techniques. • Given a machine learning problem, select, implement and evaluate one of the appropriate machine learning algorithms (e.g. decision trees, neural networks, SVMs) using Python.
Scholastic Honesty	Students are expected to abide by the rules of scholastic honesty. Any form of scholastic dishonesty is a serious academic violation and will result in a disciplinary action. Violations of scholastic honesty include, but are not limited to cheating, plagiarizing, fabricating information or citations, facilitating acts of dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students.
Flexibility	Circumstances may arise during the course that prevents the instructor from fulfilling each and every component of this syllabus; therefore, the syllabus is subject to change. Students will be notified prior to any changes.