

Date	Main topics	Class topic	Suggested reading	Modules	Assignments	Tests
8/21/2022	Introduction	Data science example; applications, curve fitting	Bishop 1.1; Hastie et al. 2.1-2.2	1,2		
8/23/2022	Probability and models	Terminology, probability review		3,4		Quiz1
8/28/2022		ML concepts, Minimum description length	Rissanen; Mohri et al. 2	5,6		
8/30/2022		Model complexity	detailed supplements	7A-7C	HW1 (probability)	Quiz2
9/4/2022	<b>Labor Day</b>					
9/6/2022		Kolmogorov complexity	Vitanyi	8		
9/11/2022	Scientific programming	Motivation for scientific programming	Cormen et al. 1, 2.1, 30	9,10		
9/13/2022		Computational complexity, algorithm design	Cormen et al. 5.4-5.5, 11.1-11.2	11-13	HW2 (models)	Quiz3
9/18/2022		Computing architectures		14,15		
9/20/2022		Data structures, graphs		16-17	HW3 (sorting)	Quiz4
9/25/2022		Trees, profiling		18-19		
9/27/2022	Optimization	Motivation for optimization, dynamic programming	DP in Cormen	20,21	HW4 (scientific programming)	Quiz5
10/2/2022		Linear programming, convex optimization		22,23		
10/4/2022		Integer programming, EM algorithm, discuss project		24,25		Test1
10/9/2022	<b>Fall break</b>					
10/11/2022	Machine learning 101	Classifiers (nearest neighbor, least squares)	Hastie et al. 2.1-2.5	26	HW5 (optimization) & project pr	Quiz6
10/16/2022		Decision theory, linear regression, clustering	Hastie et al 3, 14.3	27-29		
10/18/2022		Subset selection, shrinkage, decision trees	Hastie et al. 3.4, 4	30-32	HW6 (crop yield prediction)	Quiz7, Drop deadline October 19
10/23/2022		Linear classification, LDA, & QDA	Hastie et al. 4.3, 4.4	33,34		
10/25/2022		Logistic regression, basis expansions	Hastie et al. 5.1, 5.2	35,36	HW7 (classification)	Quiz8
10/30/2022		Kernel methods, support vector machines, <b>deep learning</b>	Hastie 12.1, 12.2	37,38		
11/1/2022	Sparse signal processing	Sparsity, bases		39,40	HW8 (clustering)	Quiz9
11/6/2022		Frames, wavelets	Notes by Mike Wakin	41,42		
11/8/2022		Multiresolution approximation	Notes by Mike Wakin	43		Test2
11/13/2022		Compressed sensing, sparse recovery		44-46		
11/15/2022		Performance limits	detailed supplements	47-49	HW9	Quiz10
11/20/2022	<b>New</b>	<b>Likely guest lecture</b>		New		
11/22/2022	<b>Thanksgiving</b>					
11/27/2022		AMP + example	detailed supplements + Matlab ex.	50		
11/29/2022	Dimensionality reduction	Principle components analysis		51	HW10	Test3
12/4/2022	<b>Spare</b>	<b>To be determined</b>			Final project videos & report	
12/13/2022	<b>No Final</b>				Peer grading due	