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# CS2810 Homepage

Math of Data Models

Spring 2022

## Schedule & Notes

[all google colab python examples](#)

Idx	Day	Date	Topic	HW# (class idx) (due)[max late]	Class notes
1	Mon Tue	Jan 17*/18	Data Models Intro Linearity Gauss Jordan Elimination		<a href="#">↓ sec1</a> <a href="#">↓ sec2</a> <a href="#">↓ sec3</a>
2	Thu Fri	Jan 20/21	RREF Vector algebra Solution space of system		<a href="#">↓ sec1</a> <a href="#">↓ sec2&amp;3</a>
3	Mon Tue	Jan 24/25	Singular / homogenous matrix Vector Geometry: (length, angle, dot)	HW 1 (1-3) (Wed Feb 2)[2]	<a href="#">↓ sec1</a> <a href="#">↓ sec2&amp;3</a>
4	Thu Fri	Jan 27/28	Is Machine Learning Good? Linear Perceptron		<a href="#">↓ sec1</a> <a href="#">↓ sec2&amp;3</a> <a href="#">↓ sec2&amp;3_ica</a>
5	Mon Tue	Jan 31 Feb 1	Linear Perceptron		<a href="#">↓ sec1</a> <a href="#">↓ sec2&amp;3</a> perceptron
6	Thu Fri	Feb 3/4	Matrix Multiplication Matrix Transforms	HW 2 (4-6) (Sun Feb 13)[1]	<a href="#">↓ sec1</a> <a href="#">↓ sec2</a> <a href="#">↓ sec3</a>

7	Mon Tue	Feb 7/8	Span Linear Independence		<a href="#">↓ sec1</a> <a href="#">↓ sec2</a> <a href="#">↓ sec3</a>
8	Thu Fri	Feb 10/11	Projections Line of best fit Polynomial of best fit		<a href="#">↓ sec1</a> <a href="#">↓ sec2</a> <a href="#">↓ sec3</a> <a href="#">line_best_fit</a> <a href="#">calc_lin_alg</a>
9	Mon Tue	Feb 14/15	Inverses Change of basis	HW 3 (7-9) (Sun Feb 21)[1]	<a href="#">↓ sec1</a> <a href="#">↓ sec2</a> <a href="#">↓ sec3</a>
10	Thu Fri	Feb 17/18	<b>Quiz 1 (HW 1-2)</b> Dynamical system (intro)		<a href="#">↓ sec2</a> <a href="#">↓ sec3</a>
11	Mon Tue	Feb 21*/22	Eigenvectors Dynamical system	HW 4 (10-11) (Sun Feb 27)[2]	<a href="#">sec1_lec_canvas</a> <a href="#">↓ sec1_lec11.zip</a> <a href="#">↓ sec2</a> <a href="#">↓ sec3</a>
12	Thu Fri	Feb 24/25	Begin Prob & Stats: Expectation & Variance Linearity of Expectation		<a href="#">↓ sec1</a> <a href="#">↓ sec2&amp;3</a>
13	Mon Tue	Feb 28 Mar 1	Independence Law of large numbers Binomial / Poisson Distribution	HW 5 (12-13) (Sun Mar 6)[2]	<a href="#">↓ sec1</a> <a href="#">↓ python_examples.py</a> <a href="#">↓ sec2</a> <a href="#">↓ sec3</a> <a href="#">law_large_num_demo</a> <a href="#">prob_stats_calc</a>
14	Thu Fri	Mar 3/4	<b>Quiz 2 (HW 3-4)</b>		
15	Mon Tue	Mar 7/8	Estimators Bias Bessel's correction	HW 6 (14-15) (Sun Mar 20)[2]	<a href="#">↓ sec1</a> <a href="#">↓ sec2</a> <a href="#">↓ sec3</a> <a href="#">sec2&amp;3_bessel</a>
16	Thu Fri	Mar 10/11	Mini-Project Day (Line of Best Fit, Perceptron, dynamical system)		<a href="#">sec1</a> <a href="#">sec1_bessel</a> <a href="#">↓ sec2&amp;3</a> <a href="#">mini_proj1</a> <a href="#">↓ mini_proj1_csv</a>
		Break			
17	Mon Tue	Mar 21/22	Normal distribution Central Limit Theorem Cumulative Distribution Function		<a href="#">↓ sec1</a> <a href="#">↓ pdf_cdf_sec1.ipynb</a> <a href="#">↓ pdf_cdf_sec1.html</a> <a href="#">↓ sec2</a> <a href="#">↓ sec3</a> <a href="#">cdf_sec2&amp;3</a> <a href="#">central_limit_theorem</a>

18	Thu Fri	Mar 24/25	Hypothesis testing P-value	HW 7 (17-19) (Sun Apr 3)[2]	<a href="#">↓ sec1</a> <a href="#">↓ sec2</a> <a href="#">↓ sec3</a>
19	Mon Tue	Mar 28/29	T-tests One vs two sided tests Experimental bias		<a href="#">↓ sec1</a> <a href="#">↓ sec2</a> <a href="#">↓ sec3</a> <a href="#">ttest_example_excel</a> <a href="#">↓ ttest_example.html</a> <a href="#">↓ ttest_example.ipynb</a>
20	Thu Fri	Mar 31 Apr 1	<b>Quiz 3 (HW 5-6)</b>		
20**	Mon Tue	Apr 4/5	Chi square test Multiple comparison correction		<a href="#">↓ sec1</a> <a href="#">↓ sec2</a> <a href="#">↓ sec3</a> <a href="#">↓ chisquare_example.html</a> <a href="#">↓ chisquare_example.ipynb</a>
21	Thu Fri	Apr 7/8	Covariance Covariance matrix	HW 8 (20-22) (Sun Apr 17)[2]	<a href="#">↓ sec1</a> <a href="#">↓ cov_corr_example.html</a> <a href="#">↓ cov_corr_example.ipynb</a> <a href="#">↓ sec2</a> <a href="#">↓ sec3</a>
22	Mon Tue	Apr 11/12	Correlation Independence Bayes Rule		<a href="#">↓ sec1</a> <a href="#">↓ sec2</a> <a href="#">↓ sec3</a>
23	Thu Fri	Apr 14/15	Bayes Nets 1		<a href="#">↓ sec1</a> <a href="#">bayes_example</a> <a href="#">↓ sec2</a> <a href="#">↓ sec3</a>
24	Mon Tue	Apr 18*/19	Bayes Nets 2	HW 9 (22-24) (Weds Apr 27)[2]	<a href="#">↓ sec1</a> <a href="#">↓ sec2</a> <a href="#">↓ sec3</a> <a href="#">↓ joint_ex.csv</a>
25	Thu Fri	Apr 21/22	Mini-Project Day: Hypothesis Testing Bayes Net		<a href="#">↓ sec1</a> <a href="#">↓ sec2&amp;3</a> <a href="#">mini_proj2</a>
26	Mon Tue	Apr 25/26	Finals Review		<a href="#">sec1</a> <a href="#">↓ sec2</a> <a href="#">↓ sec3</a>
	May 3	“Final” (Sec2&3)	<b>Quiz 4 (HW 7-9)</b> Ell Hall AUD (8-10am)		
	May 4	“Final” (Sec1)	<b>Quiz 4 (HW 7-9)</b> Snell Engineering Center 108 (1-3pm)		

	May 6	“Final” (sec3 option)	<b>Quiz 4 (HW 7-9)</b> Mugar Life Science Building 201 (8-10am)		
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Note that we'll take quiz-test 4 during the time slot given by the finals schedule.

\*denotes asynchronous lectures given to section 1 (university holiday on that day)

\*\* we lost our index sync from lessons 14 to 20 (pdfs are labelled with a different day than this table) we're repeating index 20 to get back on track without renaming anything to confuse folks. sorry about that!