

MATH 338 (SYLLABUS)

Professor	Marcello Lucia Office 1S-226, marcello.lucia@csi.cuny.edu http://www.math.csi.cuny.edu/~mlucia/																						
Time and Place	Monday, Wednesday : 4:40–6:20pm, 2M–205																						
Office hours	Monday, Wednesday: 3:00–4:30pm, or by appointment.																						
Textbook	INTRODUCTION TO LINEAR ALGEBRA, by <i>Strang (5th Edition)</i> Wellesley-Cambridge Press & Co. (2016) ISBN: 978-0-9802327-7-6																						
Course Outline	This course aims to study linear systems of equations, and develop a theory to understand the structure of the related set of solutions. To reach this goal, we will discuss the <i>Gauss elimination method</i> and learn how to implement it using matrix notations. A deeper understanding will be achieved with the more abstract notions of <i>vector space</i> , <i>basis</i> and of <i>linear maps</i> . In order to simplify some computations, we will then discuss the <i>eigenvalues of a matrix</i> and see how it can be applied in many relevant problems in science.																						
Course Grade	The final course grade is determined as follows: <table><tr><td></td><td></td><td>Test 1</td><td>10%</td><td></td><td></td></tr><tr><td>Homework</td><td>5%</td><td>Test 2</td><td>15%</td><td>Final</td><td>45%</td></tr><tr><td></td><td></td><td>Test 3</td><td>25%</td><td></td><td></td></tr></table> The material on each exam is cumulative and based on the lectures given in class together with the HW. First test: Wednesday, September 30th Second Test: Monday, November 2nd Third Test: Wednesday, December 2nd To better understand some solutions written on a test, you may be asked to provide additional oral explanations during my office hours.							Test 1	10%			Homework	5%	Test 2	15%	Final	45%			Test 3	25%		
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Homework	5%	Test 2	15%	Final	45%																		
		Test 3	25%																				
Homework	To submit the HW, use “Webwork” that can be found on the CSI-Mathematics Website. Go to http://www.math.csi.cuny.edu/ and follow the links.																						
Integrity policy	In every university, College of Staten Island included, there is an integrity policy. You can find it on brightspace and you should look at it.																						
Cell phone	Cell phone must be switched off. No phone during my lectures.																						

Lesson Plan

Below, each lesson corresponds to a 100 minutes class.

The lesson may start with a 10-15 minutes student presentation on a topic that I will assign.

Lesson	Sections	Topics	Homework
1	1.1, 1.2	Vectors, Linear combinations, Dot Products	p.8, p.17
2	1.3, 2.1	Matrices, Linear equations	p.29, p.40
3	2.2, 2.3	Elimination, Row Equivalent matrices	p.52, p. 64
4	2.4	Matrix operations	p.76
5	2.5	Inverse matrices	p.90
6	2.6	Factorization $A=LU$	p.102
7	2.7	Transpose, permutations	p.115
8		Exam 1 (September 30th)	
9	3.1	Vector spaces	p.128
10	3.1	Vector spaces	p.128
11	3.2	Null space	p.140
12	3.3	Rank and solutions to $AX = b$	p.155
13	3.4	Independence, basis, dimension	p.174
14	3.5	Dimension of the four subspaces	p.189
15	4.1	Orthogonality of the four subspaces	p.200
16	4.2	Projections	p.214
17		Exam 2 (November 2nd)	
18	4.3	Least squares approximations	p.227
19	4.4	Orthogonal Bases and Gram-Schmidt	p.240
20	5.1	Determinants	p.252
21	5.2	Permutation and cofactors	p.264
22	5.3	Cramer's rule, inverses	p.281
23	6.1	Eigenvalues	p.295
24	6.2	Diagonalizing a matrix	p.311
25		Exam 3 (December 2nd)	
26	6.4.	Symmetric matrices,	p.343
27	6.5	positive definite matrices	p.357
28	8.1, 8.2	Linear Transformations <i>Last Day of Class (Dec. 14th)</i>	p.406 and p.417

You must do as much as possible HW from the book.

The pages indicated above only give the first page of the problems related to the section covered.

The HW on Webwork must be submitted every Sunday.