# Information
## Math 338

**Professor** Marcello Lucia
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**Time and Place** Monday, Wednesday : 6:30–8:10pm, 1S-219

**Office hours** Monday: 4:40–5:30pm,
Wednesday: 4:40–5:30pm, 8:10–8:50pm.

**Textbook** Introduction to Linear Algebra, by *Strang (5th Edition)*
Wellesley-Cambridge Press & Co. (2016)
ISBN: 978-0-9802327-7-6
(**The book is mandatory**)

**Course Outline** This course aims to study linear systems, and develop a theory to understand the structure of the solutions. To reach this goal, we will introduce the concepts of matrix, vector space and of linear maps.

**Course Grade** The final course grade is determined as follows:

| | |
|---|---|
| **Homework** | 10% |
| **First Test** | 10% |
| **Second Test** | 30% |
| **Final** | 50% |

**First test**: Wednesday, February 26th
**Second Test**: Wednesday, April 23rd

**Homework** The HW must be submitted using "Webwork" that can be found on the mathematics Website of CSI. Go to `http://www.math.csi.cuny.edu/` and follow the links.

**Extra Credit** This class is difficult, but extra credits will be given as follows

| | |
|---|---|
| **Quiz 1, 02/19** | 10 points on Exam 1 |
| **Quiz 2, 04/09** | 10 points on Exam 2 |
| **Quiz 3, 05/12** | 20 points on Final |

**Integrity policy** Cheating .... Please refer to
`http://www.csi.cuny.edu/privacy/cuny_academic_integrity.pdf`

**Cell phone** Let us stay focused on the class !
Thus, cell phone must be switched off. No phone during my lectures.

**Lesson Plan**
Below, each lesson corresponds to a 100 minutes class.
There will be a break of 5 minutes after 50 minutes.
Some lesson will start with a 10 minutes student presentation taken from the textbook.

| 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 | Gauss Elimination, Elimination using matrices | p.52, p. 64 |
| 4 | 2.4 | Matrix operations | p.76 |
| 5 | | Row Echelon Form<br>Reduced Row Echelon Form | |
| **6** | | **Quiz 1 (02/19)** | |
| 7 | 2.5 | Inverse matrices | p.90 |
| **8** | | **Exam 1 (Wednesday, 02/26)** | |
| 9 | 2.6 | Factorization A=LU | p.102 |
| 10 | 2.7 | Transpose, permutations | p.115 |
| 11 | 3.1 | Vector spaces, Null Space | p.128, p.140 |
| 12 | 3.3 | Rank and solutions to AX = b | p.155 |
| 13 | 3.4 | Independence | p.174 |
| 14 | 3.4 | basis, dimension | p.174 |
| 15 | 3.5 | Dimension of the four subspaces | p.189 |
| 16 | 4.1 | Orthogonality of the four subspaces | p.200 |
| 17 | 4.2 | Projections | p.214 |
| 18 | 4.3 | Least squares approximations | p.227 |
| 19 | 4.4 | Orthogonal Bases and Gram-Schmidt | p.240 |
| **20** | | **Quiz 2 (04/09)** | |
| 21 | 5.1 | Determinants | p.252 |
| **22** | | **Exam 2 (Wednesday, 04/23)** | |
| 23 | 5.2 | Permutation and cofactors | p.264 |
| 24 | 6.1 | Eigenvalues | p.295 |
| 25 | 6.2 | Diagonalizing a matrix | p.311 |
| 26 | 6.4, 6.5 | Symmetric matrices, positive definite matrices | p.343 and p.357 |
| **27** | | **Quiz 3 (05/12)** | |
| 28 | 8.1, 8.2 | Linear Transformations<br>(Last Day of Class May 14th) | p.406 and p.417 |

You must to do as much as possible HW from the book.
The page indicated above gives only the first page of the problems related to the section covered.
The HW on Webwork must be submitted every Sunday.