

**Tandon School of Engineering, New York University**  
Department of Electrical and Computer Engineering

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**ECE-GY 5253: *Applied Matrix Theory***

Instructor:	Prof. Z. P. Jiang	Contact hours:	before/after class
	Phone: (646) 997-3646		or, by appointment
	zjiang@nyu.edu		Room 1001, Jay 370

**Course Outline**

<u>Week</u>	<u>Subject</u>
I	Elementary facts about matrices and determinants
II	Theory of linear equations
III	Eigenvalues and eigenvectors
IV-VI	Canonical forms and transformations
VII	The Jordan canonical form
VIII	<b>Midterm</b>
IX-X	Norms, location of eigenvalues, and singular value decomposition
XI	Matrix analysis of differential and difference equations
XII	Application to stability analysis of linear systems
XIII	Nonnegative matrices
XIV	Computational issues
XV	<b>Final</b> (mid-December, 2020)

**References:**

- (Recommended Text) R.A. Horn and C.R. Johnson, *Matrix Analysis*. 2nd edition. Cambridge Univ. Press, 2013. ISBN: 978-0-521-54823-6
- A. J. Laub, *Matrix Analysis for Scientists and Engineers*. SIAM, 2005.
- (Math.-oriented) F. R. Gantmacher, *The Theory of Matrices*. Vol. I & Vol. II, 1953.
- Class notes.

**Grading Policy:** Midterm: 35% ,      Final: 45%,      Homework: 20%

**TAs:** Won Yong Ha, Leilei Cui

*Note:* All lecture notes and weekly homework/ HW solutions will be posted at the course site at NYU Classes