

Applied Linear Algebra

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Timetable: 16 hours. First lecture on March, Monday 21st 4:30 am. Second Lecture on March, Wednesday 23rd, 2.30 pm. All other 6 lectures on Wednesday (2.30 pm) and Friday (10.30 am) starting from March, Wednesday 30th 2016 (Dept. of Information Engineering, Via Gradenigo 6/a, Padova)

Course requirements: A good working knowledge of basic notions of linear algebra as for example in [1]. Some proficiency in MATLAB.

Examination and grading: Grading is based on homeworks or a written examination or both.

Aim: We study concepts and techniques of linear algebra that are important for applications with special emphasis on the topics *low rank approximation* and *matrix equations and inequalities*. A wide range of exercises and problems will be an essential part of the course and constitute homework required to the student.

Course contents:

- Review of some basic concepts of linear algebra and matrix theory
- The singular value decomposition and applications
- Krylov subspaces
- Matrix equations and matrix inequalities
- Sylvester and Lyapunov equations, Riccati equation, linear matrix inequalities (LMIs)

References:

[1] Gilbert Strang's linear algebra lectures, from M.I.T. on You Tube

[2] Notes from the instructors