

Applied Linear Algebra

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Timetable: 16 hours. Class meets on Tuesday and Thursday, from 14:30 to 16:30. First lecture on Tuesday, April 9, 2013, last lecture on May 7, 2013. Room Pe (Dept. of Information Engineering, Via Gradenigo 6/a, Padova)

Course requirements: A good working knowledge of basic notions of linear algebra, as presented e.g. in [1]. Proficiency in MATLAB is essential.

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

Aim: We study concepts and techniques of linear algebra, which are important for applications and computational issues. A wide range of exercises and problems will be presented such that a practical knowledge of tools and methods of linear algebra can be acquired.

Course contents:

- *Kronecker products*
- *Linear matrix equations (Sylvester equations, Lyapunov equations)*
- *Systems of linear difference and differential equations with applications (e.g. damped linear vibrations)*
- *Structured matrices (e.g. stochastic and doubly stochastic matrices)*

References:

- [1] E. Gregorio and L. Salce. *Algebra Lineare*. Edizioni Libreria Progetto, Padova, 2005.
- [2] A.J. Laub. *Matrix Analysis for Scientists and Engineers*, SIAM, Philadelphia, 2005,
- [3] C.D. Meyer. *Matrix Analysis and Applied Linear Algebra*, SIAM, Philadelphia, 2000.