Graduate Course

"The Theory of Matrices"

V. Simoncini
Dipartimento di Matematica
Universita' di Bologna

Syllabus:

- Brief Survey on eigenvalues, eigenvectors, similarity
  transformations for Hermitian and non-Hermitian matrices.

- Unitary Matrices, Unitary Transformations.
  Normal matrices. QR factorization.

- Hermitian matrices. Cholesky factorization.
  Positive definite matrices and their properties.

- Canonical forms: Jordan form and Schur form. Some key properties.

- Singular value decomposition. Variational characterization of
  singular values.
  Inequalities involving eigenvalues and singular values.
  Field of values. Polar decomposition.

- Matrix equations and their basic properties.

- Matrix functions and their elementary properties.