**Matrix Analysis**

**Course Code**

112130203

**Instructors**

Prof. Li Qiu and Prof. Jian Chen

**When & Where**

Fall, 2013 Monday, 18:30 - 20:55

Sept. 9(One Hour), Sept. 16, Sept. 23, Sept. 30, Oct. 14, Oct. 21, Oct. 28, and Nov. 4

Wednesday, 10:40 – 12:15

Sept. 18, Sept. 25, Oct. 9, Oct. 16, and Oct. 30

控制系工程中心（邵科馆旁边）501

**Course Outline**

1. Algebraic Structures
   1. Groups, Rings, and Fields
   2. Equivalence Relations
   3. Partial Order
2. Linear Spaces
   1. Linear Spaces and Linear Transformation
   2. Normed Linear Space
   3. Inner Product Space
3. Matrix Analysis
   1. Special Matrix Operations
   2. Matrix Eigenvalue Problem
   3. Matrix Factorizations
4. Special Topics
   1. Real Symmetric and Hermitian Matrices
   2. Kronecker Product and Hadamard Product
   3. Positive and Nonnegative Matrices
   4. Polynomial Matrices
   5. Matrix Inequalities
   6. Matrix Functions

**Textbook**

Li Qiu, Matrix Theory for System and Information Engineers

**References**

R. A. Horn and C. R. Johnson, Matrix Analysis, Cambridge University Press, Cambridge, UK, 1990.

C. D. Meyer, Matrix Analysis and Applied Linear Algebra, SIAM, 2000