

# Syllabus for 18.06 Linear Algebra, Fall 2015

MWF 11-12 Room 54-100

The three midterm exams (closed book) will be held in Walker (50-340).

|                             |   |       |                                       |           |
|-----------------------------|---|-------|---------------------------------------|-----------|
| Lect 01                     | W | 09/09 | The Geometry of Linear Equations      | 1.1-2.1   |
| Lect 02                     | F | 09/11 | Elimination with Matrices             | 2.2-2.3   |
| Lect 03                     | M | 09/14 | Matrix Operations and Inverses        | 2.4-2.5   |
| Lect 04                     | W | 09/16 | $LU$ and $LDU$ Factorization          | 2.6       |
| Lect 05                     | F | 09/18 | Transposes and Permutations           | 2.7       |
| Lect 06                     | M | 09/21 | Vector Spaces and Subspaces           | 3.1       |
| Lect 07                     | W | 09/23 | The Nullspace: Solving $Ax = 0$       | 3.2       |
| Lect 08                     | F | 09/25 | Rectangular $PA = LU$ and $Ax = b$    | 3.3-3.4   |
| Lect 09                     | M | 09/28 | Row Reduced Echelon Form              | 3.3-3.4   |
| Lect 10                     | W | 09/30 | Basis and Dimension                   | 3.5       |
| Lect 11                     | F | 10/02 | Quiz Review                           |           |
| *****                       | M | 10/05 | Exam 1: Chap 1-3.5                    |           |
| Lect 12                     | W | 10/07 | The Four Fundamental Subspaces        | 3.6       |
| Lect 13                     | F | 10/09 | Graphs and Networks                   | 8.2       |
| —                           | M | 10/12 | —COLUMBUS DAY—                        |           |
| Lect 14                     | T | 10/13 | Orthogonality                         | 4.1       |
| Lect 15                     | W | 10/14 | Projections and Subspaces             | 4.2       |
| Lect 16                     | F | 10/16 | Least Squares Approximations          | 4.3       |
| Lect 17                     | M | 10/19 | Gram-Schmidt and $A = QR$             | 4.4       |
| Lect 18                     | W | 10/21 | Properties of Determinants            | 5.1       |
| Lect 19                     | F | 10/23 | Formulas for Determinants             | 5.2       |
| Lect 20                     | M | 10/26 | Applications of Determinants          | 5.3       |
| Lect 21                     | W | 10/28 | Eigenvalues and Eigenvectors          | 6.1       |
| Lect 22                     | F | 10/30 | Diagonalization                       | 6.2       |
| Lect 23                     | M | 11/02 | Markov Matrices                       | 8.3       |
| Lect 24                     | W | 11/04 | Quiz Review                           |           |
| *****                       | F | 11/06 | Exam 2: Chap 1-5, 8.2                 |           |
| Lect 25                     | M | 11/09 | Differential Equations                | 6.3       |
| —                           | W | 11/11 | —VETERAN's DAY—                       |           |
| Lect 26                     | F | 11/13 | Complex Matrices, Hermitian Matrices  | 10.2      |
| Lect 27                     | M | 11/16 | FFT, Fourier Series                   | 8.5, 10.3 |
| Lect 28                     | W | 11/18 | Positive Definite Matrices            | 6.5       |
| Lect 29                     | F | 11/20 | Linear transformations                | 7.1–7.2   |
| Lect 30                     | M | 11/23 | Sparse matrices and iterative methods | 9.3       |
| Lect 31                     | W | 11/25 | Singular value decomposition          | 6.7       |
| —                           | F | 11/27 | —THANKSGIVING—                        |           |
| Lect 32                     | M | 11/30 | Quiz Review                           |           |
| *****                       | W | 12/02 | Exam 3: Chap 1-8                      |           |
| Lect 33                     | F | 12/04 | Google PageRank, image compression    |           |
| Lect 34                     | M | 12/07 | Roundoff error and condition numbers  | 9.2       |
| Lect 35                     | W | 12/09 | Course Review                         |           |
| ===== Final Exam Week ===== |   |       |                                       |           |