

DIVISION OF APPLIED MATHEMATICS, BROWN UNIVERSITY
Calendar, Introduction to Computing Sciences
20914 – APMA 0160 – S01, Spring 2008

Section numbers refer to Van Loan’s textbook. On a given day we will strive to cover material drawn either from the indicated sections or supplemental notes, but this plan is subject to further revision. Lecture notes for each day will be posted online. First version, 23 January 2008.

JANUARY

23 We	Course description and guidelines.	
25 Fr	Section 1.1 (basic MATLAB)	matlab1.
28 Mo	Section 1.3 (programming MATLAB)	matlab2.
30 We	Section 1.2 (array indexing and graphics)	matlab3.

FEBRUARY

01 Fr	Supplemental notes (vectors, matrices, and norms)	linalg1.
04 Mo	Supplemental notes (introduction to linear systems)	linalg2.
06 We	Supplemental notes (triangular systems and Gaussian elimination)	linalg3.
08 Fr	Section 2.1 (introduction to interpolation)	interp1.
11 Mo	Section 2.1 (the Vandermonde matrix)	interp2.
13 We	Sections 2.2 & 2.4 (polynomial interpolation: the Newton method)	interp3.
15 Fr	Supplemental notes (polynomial interpolation: the Lagrange method)	interp4.
18 Mo	Long weekend, no class.	
20 We	Section 2.3 (accuracy of polynomial interpolation)	interp5.
22 Fr	Section 3.1 (piecewise-linear interpolation)	interp6.
25 Mo	Section 3.2 (cubic Hermite interpolation)	interp7.
27 We	Section 3.3 (cubic splines I and first project assigned)	interp8.
29 Fr	Section 3.3 (cubic splines II)	interp9.

MARCH

03 Mo	Loose ends or special topic	interp10.
05 We	Section 4.1 (Newton–Cotes rules for numerical quadrature)	quad1.
07 Fr	Section 4.1 (error for Newton–Cotes rules)	quad2.
10 Mo	Section 4.2 (composite rules)	quad3.
12 We	Section 4.3 (adaptive quadrature)	quad4.
14 Fr	Section 4.4 (Gaussian quadrature)	quad5.
17 Mo	Section 4.4 (Gaussian quadrature)	quad6.
19 We	Midterm exam.	
21 Fr	Loose ends or special topic	quad7.

24 Mo	Spring recess, no class.
26 We	Spring recess, no class.
28 Fr	Spring recess, no class.
31 Mo	Supplemental notes (finite-difference methods for numerical differentiation) diff1.

APRIL

02 We	Supplemental notes (finite-difference methods) diff2.
04 Fr	Supplemental notes (spectral methods) diff3.
07 Mo	Section 8.0-8.1 (bisection for nonlinear equations) root1.
09 We	Section 8.1 (Newton's method) root2.
11 Fr	Section 8.1 (Newton/secant method) root3.
14 Mo	Supplemental notes (hybrid methods) root4.
16 We	Sections 6.1 & 6.2 (triangular and tridiagonal systems) intlinalg1.
18 Fr	Section 6.3 (Gaussian elimination and LU decomposition) intlinalg2.
21 Mo	Section 6.3 (Gaussian elimination and LU decomposition) intlinalg3.
23 We	Section 7.1 (least squares) intlinalg4.
25 Fr	Section 7.1 (least squares) intlinalg5.
28 Mo	Section 9.1 (forward and backward Euler methods) numode1.
30 We	Section 9.1 (systems of ODE and Runge Kutta method) numode2.

MAY

02 Fr	Loose ends or special topic numode3.
05 Mo	Last day of class. Loose ends & course evaluations.
10 Sa	Final examination. Saturday, 10 May, 9:00 AM.