COURSE OUTLINE and HOMEWORK ASSIGNMENTS – subject to minor changes:

L-1 Mon 22 Aug 0.1-3 What is numerical analysis? – 5,6,7
L-2 Wed 24 Aug 1.1:0.4 Bisection; Errors – 9,14,15
L-3 Fri 26 Aug 0.4 Computer Arithmetic – 13,21,22
L-4 Mon 29 Aug 0.5-7 Computer Arithmetic; Measuring Efficiency – 17,27,33
L-5 Wed 31 Aug 1.1,2 Bisection and Linear Interpolation – 2,5,11
L-6 Fri 2 Sep 1.3,5 Newton’s Method & Fixed-Point Iterations – 13,18,38
Mon 5 Sep Labor Day Holiday – no classes
L-7 Wed 7 Sep 1.5 Errors and Convergence – 22,23,24
L-8 Fri 9 Sep 1.5 Aitken Acceleration and Polynomial Roots – 40,41,42

Project One due Monday 12 September at 3PM
L-9 Mon 12 Sep 1.6:7,1 Multiple Roots; Golden Section – 25,26,27
L-10 Wed 14 Sep 2.1 Introduction to Linear Algebra – 4,5,6
L-11 Fri 16 Sep 2.2 Elimination Methods – 11,13,14
L-12 Mon 19 Sep 2.2 LU Decomposition – 15,17,18,27
L-13 Wed 21 Sep 2.2 Cholesky Decomposition; Cost of Elimination – 21,28,30
L-14 Fri 23 Sep 2.2,4 Improve Stability by Pivoting – 25,29,35
L-15 Mon 26 Sep 2.4 Pivoting; Norms – 45,64,66
L-16 Wed 28 Sep 2.4 Norms and Condition Numbers – 42,43,46

Project Two due Friday 30 September at 3PM
L-17 Fri 30 Sep 1.7 Multidimensional Newton’s Method – 46,47,48
L-18 Mon 3 Oct 3.1 Lagrange and Neville Interpolation – 1,6,8
L-19 Wed 5 Oct Review for Exam I
L-20 Fri 7 Oct Exam I on Chapters 0, 1, and 2
L-21 Mon 10 Oct 3.2 Divided Differences – 12,14,30
L-22 Wed 12 Oct 3.3-5 Splines – 33,35,37
L-23 Fri 14 Oct 3.6 Least Squares Approximation – 70,71,75
L-24 Mon 17 Oct 3.2 Conditioning and Errors – 59,60,61
L-25 Wed 19 Oct 4.1,2 Chebyshev Polynomials; Rational Approximations – 13,21,23

Project Three due Friday 21 October at 3PM
L-26 Fri 21 Oct 4.3 Fourier Series – 30,31,32
L-27 Mon 24 Oct 5.1 Interpolation for Derivatives and Integrals – 4,11,14
L-28 Wed 26 Oct 5.1 Richardson Extrapolation – 19,24,27
L-29 Fri 28 Oct 5.2 Newton-Cotes formulas; Composite Rules – 31,32,34
L-30 Mon 31 Oct 5.2 Romberg Integration – 35,37,40
L-31 Wed 2 Nov 5.6 Gaussian Quadrature – 71,73,75
L-32 Fri 4 Nov Review for Exam II
L-33 Mon 7 Nov Exam II on Chapters 3, 4, and 5
L-34 Wed 9 Nov 6.1,2 Taylor-Series and Euler Methods – 1,4,5,7

Project Four due Friday 11 November at 3PM
L-35 Fri 11 Nov 6.3,4 Runge-Kutta and Multistep Methods – 9,15,16
L-36 Mon 14 Nov 6.4 Predictor-Corrector Methods – 21,29,33
L-37 Wed 16 Nov 6.5,6 Higher-Order Equations and Systems – 40,43,44
L-38 Fri 18 Nov 6.7 The Shooting Method – 56,58,59
L-39 Mon 21 Nov 6.7 Finite Differences – 60,61,62
L-40 Wed 23 Nov 6.8 Characteristic-Value Problems – 72,74,76
Fri 25 Nov Thanksgiving Holiday – no classes
L-41 Mon 28 Nov Review of Chapters 0, 1, and 2

Project Five due Wednesday 30 November at 3PM
L-42 Wed 30 Nov Review of Chapters 3, 4, and 5
L-43 Fri 2 Dec Review of Chapter 6

Wednesday 7 December, 1:00–3:00PM: Final Exam – room to be announced.