

Methods of Applied Mathematics

Fall Quarter Outline

Week	Seminar/Student Presentations	Lab	Linear Algebra	Differential Equations	Multivariable Calculus
1	Lecture: Stewart 9.1-9.2 Vectors	Intro to Mathematica	Lay 1.1-1.2 Row Reduction Workshop	B&D 1.1 Intro. to Differential Eqns.	Stewart 9.3 Dot Product
			Lay 1.3-1.4 Vector and Matrix Equations	B&D 1.2 Separation of Variables Workshop	Stewart 9.4-9.5 Cross Product, Lines and planes
2	Seminar: Math Experience pp. 1-119	Solving Differential Equations	1.5 Linear Systems Workshop	B&D 1.3-1.4 Slope Fields/Euler's Method	Stewart 10.1-10.2 Space Curves Mathematica Demo
			Lay 1.7-1.8 Linear Transformations	B&D 1.5-1.6 Existence and Uniqueness	Stewart 10.3 Arc Length and Curvature Workshop
3	Seminar: Math Experience pp. 122-200 Lay 1.6 Applications of Linear Systems B&D Lab 1.1 Memorization	Matrix Manipulations	Lay 2.1-2.3 Matrix Operations	B&D 1.7 Bifurcations	Stewart 10.4 Frenet Frame
			Test on Chapter 1	B&D 1.8-1.9 Linear Differential Eqns. Workshop	Stewart 9.6 and 10.5 Surfaces Mathematica Demo
4	Seminar: Math Experience pp. 272-359 Lay 1.9 Linear Models B&D Lab 1.3 Logistic with Harvesting	Visualizing Multivariable Functions	Lay 2.8-2.9 Subspaces, Dimension and Rank	Test on Chapter 1	Stewart 11.1-11.2 Multivariable Functions
			Lay 4 Vector spaces Workshop	B&D 2.1-2.2 First Order Systems Workshop	Test on Chapter 9 and 10 Stewart 11.3 Partial Derivatives
5	Seminar: Math Experience pp. 363-411 Lay 2.6 Leontief Model B&D Lab 1.5 Extinction of Pigeon	Solving Systems of Differential Equations	Lay 5.1-5.2 Eigenvalues/Eigenvectors	B&D 2.3-2.4 Analytic and Numerical Methods	Stewart 11.4 Tangent Planes
			Lay 5.3 Diagonalization Workshop	B&D 3.1-3.2 Linear Systems	Stewart 11.5-11.6 Directional Derivatives
6	Lay 2.7 Computer Graphics Lay 4.9 Markov Processes B&D Lab 2.2 Species Dynamics B&D Lab 2.3 Modified Damping	Gradients and Directional Derivatives	Lay 5.5 Complex Eigenvalues Workshop	B&D 3.3 Phase Planes	Stewart 11.7 Max and Min values
			Lay 3.1-3.2 Determinants	Test on Chapter 2	Test on Chapters 10 and 11
7	Lay 5.6 Discrete Dynamical Systems Lay 3.3 Cramer's Rule B&D Lab 2.4 Spring and Band B&D Lab 2.5 Shock Absorbers	Eigenvalues & Eigenvectors	Lay 6.1-6.2 Inner Product	B&D 3.4 Complex Eigenvalues	Stewart 11.8 Lagrange Multipliers
			Test on Chapter 2 and 5	B&D 3.5-3.7 2 nd Order Linear Diff. Eqns.	Stewart 12.1-12.3 Double Integrals
8	Lay 3.3 Areas and Volumes Lay 4.8 Applications to Difference Eqns B&D Lab 3.2 RLC Circuits B&D Lab 3.4 Parameter Space	TBA	Lay 6.3-6.4 Projections/Gram-Schmidt	B&D 3.8 3D Systems	Stewart 12.4 Polar Coordinates
			Lay 6.5 Least Squares Workshop	B&D 4.1-4.2 Forced Oscillations	Stewart 12.5-12.6 Applications Workshop
9	Lay 6.6 Applications to Linear Models Lay 5.8 Eigenvalue Estimates B&D Lab 4.2 Forced RLC Circuit B&D Lab 4.1 Two magnets	Least Squares	Lay 6.7-6.8 Inner Product Spaces	B&D 4.3 Resonance	Stewart 12.7 Volume Integrals
			Lay 7.1-7.2 Quadratic forms	B&D 4.4 Amplitude and Phase Workshop	Stewart 9.7 + 12.8 Cylindrical / Spherical
10	Lay 7.5 Image Processing Lay 6.8 Inner Product Applications B&D Lab 4.3 Tacoma Narrows B&D Lab 5.2 Higher Order Pendulum	No Lab Review for Exams	Lay 7.3 Constrained Optimization Review Workshop	B&D 5.1-5.2 Intro to Nonlinear Systems	Stewart 12.9 Change of Variables
			Cumulative Final Exam	Cumulative Final Exam	Cumulative Final Exam

