

Psychology 312
Spring, 2012
Tentative Schedule of Activities

Date	Topic(s)	Reading & Homework
Week 1		
Mon 01/09	Course Introduction Administrative Details Overview of Multivariate Methods	Harlow, Chapters 1–2 [[LH01.pdf , LH02.pdf]] Rencher, Chapter 1 [[AR01.pdf]] Homework Assignment 1 , Due in one week. I will ask you to present your answers to the class.
Wed 01/11	Mathematical Prerequisites The Algebra of Variances and Covariances Linear Transformations Linear Combinations Mean of a Linear Combination Variance of a Linear Combination Covariance of Two LCs Introduction to Matrix Algebra Types of Matrices Matrix Addition Scalar Multiples Scalar Products Matrix Multiplication	Handout Chapter 3, The Scalar Algebra of Variances and Covariances, [[Covariances.pdf]] p. 31–51 Handout, Chapter 4, Introduction to Matrix Algebra p. 53–60 [[Matrix.pdf]] Homework Assignment 2 Due Monday 01/23 I will ask you to present your answers to the class.
Week 3		
Wed 01/18	Introduction to Matrix Algebra (ctd) Transposition Linear Combinations Sets of Linear Combinations Extracting Rows and Columns	<i>Chapter 4, Introduction to Matrix Algebra</i> <i>p. 57–75</i> R-intro Handout, p. 1–22

Week 4		
Mon 01/23	Matrix Algebra of Sample Statistics Covariance Matrices Correlation Matrices	<i>Chapter 4, Introduction to Matrix Algebra</i> <i>p. 75-80</i> Homework Assignment 3 , Due Monday 02/06. I may ask you to present your answers to the class.
Wed 01/25	Review of Univariate Expected Value Algebra Random Vectors and Random Matrices Matrix Expected Value Algebra Covariance Algebra for Sets of Linear Combinations	
Week 5		
Mon 01/30	Introduction to R Matrix Manipulation in R Eigenvalues and Eigenvectors Eckart-Young decomposition of a symmetric Matrix Symmetric Powers of a Symmetric Matrix Matrix Factorization and Random Number Generation Creating Data with Exact Attributes Creating Samples from a Population with Known Attributes Defining our own matrix functions	<i>Chapter 4, Introduction to Matrix Algebra</i> <i>p. 82-84</i> Download <i>R Utility Functions</i> and documentation from the R Code and Support Materials section of the website. Homework Assignment 4 , Due Wednesday 02/15. I may ask you to present your answers to the class.
Wed 02/01	Regression Analysis Basics of Linear Regression and Multiple Regression Algebra Linear Regression in R – Practical Aspects	<i>Chapter 5, The Algebra of Linear Regression and Partial Correlation.</i> Gelman & Hill, Ch. 3 Gelman & Hill, Ch. 4 Weisberg, Ch. 1 Weisberg, Ch. 2
Week 6		
Mon 02/06	Projection Operators and the Geometry of Multiple Regression Fallacies of Stepwise Regression	Wickens Ch 1-4 (Optional)
Wed 02/08	Constrained Multiple Regression Systems Multivariate Regression Systems with Latent Variables	Homework Assignment 5, Due Wednesday 02/22