

Week 3		
W (09/05)	An Introduction to R	
M (09/07)	The Normal Distribution The general nature of a continuous distribution Normal distribution calculations: Standard Textbook Interval Calculations Relative Tail Probability Calculations	G&H Chapter 6
F (09/09)	Correlation and covariance Basic definitions and formulas Invariance properties	G&H 7.1–7.13 <i>KeyConcepts.pdf</i> handout, pages 1–13
Week 4		
M (09/12)	The laws of linear combination What is a linear combination” Identifying linear weights Linear rule for means Heuristic rule for variances and covariances	<i>KeyConcepts.pdf</i> handout, pages 13–18.
W (09/14)		
F (09/16)	<i>Microcomputer Lab 1</i> Some Fundamental R Statistical Skills	Lab 1 Handout Homework Assignment 1 (Due 09/26)
Week 5		
M (09/19)	Some basic applications of linear combination theory “Rich get richer” phenomenon Creating uncorrelated scores Linear Combination of uncorrelated variables Linear Regression Regression notation Basic algebra of regression Least squares linear regression Covariance of predicted scores and residuals Uses and Conceptualizations of Linear Regression Descriptive Predictive	G&H 8.1–8.13

W (09/21)	<p>“Correlational fallacies”</p> <ul style="list-style-type: none"> Correlation and causality No relation vs. no correlation Perfect correlation vs. equivalence Combining populations Restriction of range Leaving out explanatory variables 	
F (09/23)	<p><i>Microcomputer Lab 2</i></p> <p>Regression analysis: Poverty and Infant Mortality</p>	Lab 2 Handout
Week 6		
M (09/26)	<p>Conditional distribution theory</p> <ul style="list-style-type: none"> Bivariate frequency distributions Marginal distributions Conditional distributions Regression to the mean Conditional distribution calculations in the bivariate normal distribution 	Conditional Distribution Problems handout
W (09/28)	<p>Multiple Linear Regression – A Brief Introduction</p> <ul style="list-style-type: none"> Centering Data Interaction Effects 	
F (09/30)	<p><i>Microcomputer Lab 3</i></p> <p>Multiple Regression: Predicting Kids’ IQ Scores</p>	<p>Lab 3 Handout</p> <p>Homework Assignment 2 (Both of these are due on Monday, October 10)</p>
Week 7		
M (10/03)	<p>Set theory</p> <p>Discrete probability theory</p> <ul style="list-style-type: none"> Probabilistic experiments Sample spaces Simple events Compound events Three axioms Three fundamental theorems 	Sets handout
W (10/05)	<p>Probability theory (ctd)</p> <ul style="list-style-type: none"> Computing probability <ul style="list-style-type: none"> The general rule Special case: Equally likely elementary events Joint events Independence Conditional probability <ul style="list-style-type: none"> The concept The formal definition The coin in the box problem The “multiplicative rules” of probability <ul style="list-style-type: none"> General case Special case (independence) Probability of a sequence 	GH Chapter 9

	<p>The “keep it alive” strategy Poker hands Smoking tables Epidemiology</p> <p>Truncation of Coverage for Midterm Exam</p>	
F (10/07)	Fall Break – No class	
Week 8		
M (10/10)	Midterm Exam Review	
W (10/12)	Midterm Exam	
F (10/14)	Counting Rules and Combinatorics Theory The general path rule Permutations Permutations with selection Combinations	<i>Probability Theory Problems Handout</i> <i>Solutions to Probability Theory Problems Handout</i>
Week 9		
M (10/17)	Simple applications Counting the number of sets Poker hands revisited Pegboard problems in two colors Pegboard problems in multiple colors The binomial distribution The cumulative binomial Evaluating public opinion polls	
W (10/19)	Random variables Expected value of a random variable The algebra of expected values Expected value of a function of a discrete random variable Variance of a random variable Covariance and correlation for random variables Linear combination rules for random variables The binary random variable Normal approximation to the binomial	
F (10/21)	Microcomputer Lab 4 T-Tests: Theoretical Aspects (Due Monday 11/14)	<i>Lab 4 Handout</i>

Week 10		
M (10/24)	Parameters and statistics What is a “sampling distribution”? The notion of sampling error Principles of “good estimation” Unbiasedness Consistency Efficiency Sufficiency Maximum likelihood	GH Chapter 10
W (10/26)	Sampling distributions and hypothesis testing Parameter spaces and sample spaces Raw score rejection rules Error rates A Test on a Single Proportion Test statistics – The 1-Sample Z-test Standardized rejection rules 1-tailed and 2-tailed tests	GH Chapter 11 <i>Unified Approach</i> handout, pages 1–12
F 10/28	Bayes’ Theorem	
Week 11		
M 10/31	Standardized effect size, power, and sample size calculation for the 1-sample Z-test Student’s t distribution Statistical assumptions Tests on Means Independent Sample Case 1-sample test 2-sample test (independent)	Case Handouts 1,2 GH, Chapter 12
W 11/02	Generalized t -statistic on linear combination hypotheses Confidence Intervals on linear combinations of means	Case Handout 11
F 11/04	Lab 5, Creating and Using our Own Statistical Functions (Due Friday, 11/18)	<i>Lab 5 Handout</i>

Week 12		
M (11/07)	Dependent Sample Tests on Means test on two repeated measures or matched samples general test for linear combinations on dependent samples Hybrid (“Between-Within”) Tests	Unified Approach Handout, p12–14 Case Handout 3
W (11/09)	Tests on Proportions 1-Sample 2-Sample (independent) Confidence intervals A single proportion The difference between two proportions Tests and Confidence Intervals on Dependent Proportions McNemar’s Test	Case Handouts 4,5,6 GH Chapter 13 <i>Unified Approach</i> 14–18
F (11/11)	Lab 6 – <i>Writing Our Own R Functions for Correlational Tests</i> (Due Friday 12/02)	Lab 6 Handout
Week 13		
M (11/14)	Tests on Correlations 1-Sample 2-Sample (independent) 2-Sample (dependent) Confidence Intervals on Correlations	Case Handouts 7,8 Steiger (1980) GH 14.1-14.11 <i>Unified Approach</i> 19–23 Homework Assignment 3 Due 11/28
W (11/16)	The Chi-Square and <i>F</i> distributions Tests on Variances	GH 16.1-16.7 Case Handouts 9,10
F (11/18)	Review and Catch-Up	
Week 14		
	Thanksgiving Holidays – No Classes	
Week 15		
M 11/28	Tests on variances	Case Handouts 9,10
W 11/30	Analysis of Variance – An Introduction	GH 15 Analysis of Variance handout
F 12/02	Lab 7: <i>ANOVA with R</i> (Due Friday 12/09)	
Week 16		
A 12/05	Catch up, Review and Special Topics	
B 12/07	Catch up, Review, and Special Topics	
Week 17		
12/13	TUESDAY , Alternate Exam, 12 noon, Hobbs 107	
12/17	SATURDAY Official Final Exam, 9am, Hobbs 107	