**Material in text to review for Midterm Exam**

Use the lecture material as a guide to material in textbook to review. The Chapter.Section numbering is consistent between 7th and 8th editions.

Introduction to Regression Analysis

2.1 Modeling a Response

2.2 Overview of Regression Analysis

2.3 Regression Applications

2.4 Collecting the Data for Regression

Simple Linear Regression

3.1 Introduction

3.2 The Straight-Line Probabilistic Model

3.3 Fitting the Model: The Method of Least Squares

3.4 Model Assumptions

3.5 An Estimator of σ2

3.6 Assessing the Utility of the Model: Making Inferences About

the Slope β1

3.7 The Coefficient of Correlation

3.8 The Coefficient of Determination

3.9 Using the Model for Estimation and Prediction

3.10 A Complete Example

CASE STUDY 1 Legal Advertising—Does It Pay?

Multiple Regression Models

4.1 General Form of a Multiple Regression Model

4.2 Model Assumptions

4.3 A First-Order Model with Quantitative Predictors

4.4 Fitting the Model: The Method of Least Squares

4.5 Estimation of σ2, the Variance of ε

4.6 Testing the Utility of a Model: The Analysis of Variance F-Test

4.7 Inferences About the Individual β Parameters

4.8 Multiple Coefficients of Determination: R2 and R2a

4.9 Using the Model for Estimation and Prediction

A Complete Second-Order Model with Two Quantitative X’s page 212/Eight Edition

4.13 A Test for Comparing Nested Models

4.14 A Complete Example

CASE STUDY 2 Modeling the Sale Prices of Residential

Properties in Four Neighborhoods

Principles of Model Building

5.1 Introduction: Why Model Building Is Important

5.2 The Two Types of Independent Variables: Quantitative and Qualitative

5.3 Models with a Single Quantitative Independent Variable

5.4 First-Order Models with Two or More Quantitative Independent Variables

5.5 Second-Order Models with Two or More Quantitative Independent Variables

Variable Screening Methods

6.1 Introduction: Why Use a Variable-Screening Method?

6.2 Stepwise Regression

6.3 All-Possible-Regressions Selection Procedure

6.4 Caveats

CASE STUDY 3 Deregulation of the Intrastate Trucking Industry

Some Regression Pitfalls

7.1 Introduction

7.2 Observational Data versus Designed Experiments

7.3 Parameter Estimability and Interpretation

7.4 Multicollinearity

Residual Analysis

8.1 Introduction

8.2 Regression Residuals

8.3 Detecting Lack of Fit

8.4 Detecting Unequal Variances

8.5 Checking the Normality Assumption

CASE STUDY 4 An Analysis of Rain Levels in California