

# Regression Analysis (3)

(Effective Fall 2009)

**Prerequisite:** Math 251 and 310, Stat 325.

**Catalog Description:** Measuring the relationship among variables using standard regression techniques. Topics include simple, multiple and polynomial regression, model fitting, verification of model assumptions, and examination of residuals.

**Note:** This course prepares the students majoring in the mathematical sciences for careers involving Statistics. Since regression methods are widely used, this course should benefit students from many disciplines including business and agriculture.

**Learning Outcomes for Major:** This course addresses one or more of the student learning outcomes for the major.

Upon completion of his/her degree from the University of Tennessee at Martin with a major in mathematics, the graduate will be able to:

- i. apply mathematical concepts and principles to perform numerical and symbolic computations.
- ii. use technology appropriately to investigate and solve mathematical and statistical problems.
- iii. write clear and precise proofs.
- iv. communicate effectively in both written and oral form.
- v. demonstrate the ability to read and learn mathematics and/or statistics independently.

**Teaching Objectives:** The student will:

1. Have acquired the basic skills to model applied problems using regression techniques.
2. Be able to analyze simple, multiple, and polynomial regression models.
3. Be able to use the least squares method.
4. Be able to check the model assumptions for linear regression using residuals.

**Text(s):** Applied Linear Regression Models, Fourth Edition, Kutner, Nachtsheim & Neter, McGraw-Hill. ISBN: 0-07-301344-7.

**Outline:**

Chapter	Title (Sections)
1	Simple Linear Regression
2	Inferences in Regression and Correlation Analysis
3	Diagnostics and Remedial Measures
4	Simultaneous Inferences and Other Topics in Regression Analysis
5	Matrix Approach to Simple Linear Regression Analysis
6	Multiple Linear Regression
7	Multiple Regression - II
8	Regression Models for Quantitative and Qualitative Predictors
9	Building the Regression Model I: Model Selection and Validation
10	Building the Regression Model II: Diagnostics
	Additional Topics Chosen by the Instructor

**Disability  
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