

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

STAT310: Linear Regression (201)

Instructor: **Esam Al-Sawi**

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Office Hours: UTR 1:00-2:00 pm OR by appointment

Textbook

Introduction to Linear Regression Analysis, by Montgomery, Peck and Vinning, 5th edition.

Course Objectives

Present the basics of regression analysis.

Learning Outcomes: At the end of the term a student should be able to

- ▶ Find and interpret least square estimates of parameters
- ▶ Thoroughly understand and use the single linear regression model
- ▶ Thoroughly understand, build and use the multiple linear regression
- ▶ Perform hypothesis tests and construct confidence intervals in linear regression models
- ▶ Test the appropriateness of models, and analyze data

Important Notes:

- It is the student's responsibility to observe the academic calendar for important dates.
- Only University issued excuses will be accepted and only within a week of return to class.
- Excessive Absences will earn you a DN in accordance with University rules.
- **Check Blackboard regularly for announcements**

Cheating

and Plagiarism:

This course is composed of individual assignments. It is important that your individual assignment/report/project be completed with your own efforts. KFUPM instructors follow "zero tolerance" approach with regard to cheating and plagiarism. During examinations (quizzes, major exams, lab tests,...) cheating or any attempt of cheating by use of illegal activities, techniques and forms of fraud will result in a "grade of F" in the course along with reporting the incident to the higher university administration

Course Activities:

#	Activity	Weight
1	Class Activities (participation, quizzes, attendance, bonus....)	10%
2	Assessment 1 (Report about (SLR))	10%
3	Assessment 2 (Report about (MLR))	15%
4	Assessment 3 (Report about (Ch4+Ch5))	15%
5	Midterm Exam	15%
6	Project	15%
7	Final Exam	20%
	Total	100%

Important Notes:

❖ **Lectures:**

Because of the current COVID-19 situation, all lectures will be conducted online using Blackboard Collaborate Ultra or/and Microsoft Teams.

So, You need

- *a computer (desktop / laptop) with a webcam and audio capabilities.*
- *to install Microsoft Teams on your mobile phone.*
- *good internet connection.*
- *a calculator with statistical functions.*
- *your book every class (soft/hard copy).*

❖ **Class attendance policy:**

- *Attendance on time is very important.*
- *Those who frequently face connection problems will not be considered present.*
- *The student must actively participate in the lecture to be considered present.*
- *Excessive unexcused absences (Eight) will result in a grade of DN in accordance with University rules.*

Tentative Syllabus

Week	Topics	Exceptions
1	Chapter 1 Introduction	
2-3	Chapter 2 Simple Linear Regression	
4-6	Chapter 3 Multiple Linear Regression	3.3.3 Special Case of Orthogonal Columns of X 3.3.4 Testing the General Linear Hypothesis
7-8	Chapter 4 Model Adequacy Checking	
9	Chapter 5 Transformation and Weighting to Correct Model Inadequacies	5.6 Regression Model with Random Effects
10	Chapter 6 Diagnostics for Leverage and Influence	
11	Chapter 7 Polynomial Regression Models	7.3 Nonparametric Regression
12	Chapter 8 Indicator Variables	8.3 Regression Approach to ANOVA
13	Chapter 9 Multicollinearity	
14	Chapter 10 Variable Selection and Model Building	
15	Project Presentations	