King Fahd University of Petroleum and Minerals
Department of Mathematics
STAT-510: Regression Analysis (Term 221)

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Office Hours: will be announced later

Course Description: Simple linear regression and multiple regressions with matrix approach. Development of linear models. Inference about model parameters. Residuals Analysis. Analysis of variance approach. Selection of the best regression equation. Using statistical packages to analyze real data sets.

Course Objective: The main objective of course is to
- present linear and nonlinear regression models
- explain different methods of parameters estimation and inference
- demonstrate the use statistical package(s) to analyze datasets

Course Learning Outcomes: By the end of this course, students will be able to:
- Develop linear and nonlinear regression models
- Perform residuals analysis and inference about model parameters
- Build models using several model building approaches
- Use statistical packages to analyze real data sets
- Use the fitted regression model for prediction/forecasting

Textbook: M.H. Kutner, C.J. Nachtsheim, J. Neter and W. Li (2005). Applied Linear Statistical Models. Fifth Edition, McGraw-Hill International.

Supplementary Books:
Linear Regression Models - Applications in R by John P. Hoffman, Chapman & Hall/CRC (2021).
Introduction to Linear Regression Analysis by Montgomery, Peck and Vinning, 6th edition, Wiley (2021).

Assessment*

Activity	Weight
Classwork (project, home works, quizzes, assignments, attendance, bonuses, etc.)	20%
First Major Exam	25%
Second Major Exam	25%
Final Exam (Comprehensive)	30%

Important Notes:

Blackboard: All contacts or announcements between the instructor and the students are supposed to be through Blackboard, so the student must check his Blackboard at least once a day.

Academic Integrity: All KFUPM policies regarding ethics and academic honesty apply to this course.

Cheating and Plagiarism: This course is composed of individual assignments. It is important that your individual assignment be completed with your own efforts instead of copying it from your fellow student. 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.

Attendance Notes:

➢ A DN grade will be awarded to any student who accumulates more than 20% unexcused absences or more than 33% excused and unexcused absences of lectures and labs.

➢ Attendance on time is very important. Mostly, attendance will be checked within the first five minutes of the class. Entering the class after that, is considered as one late, and every two times late equals to one absence.

Tentative list of Course Contents to be covered:

Chapter	Title
1	Linear Regression with One Predictor Variable
2	Inferences in Regression and Correlation Analysis
3	Diagnostics and Remedial Measures
4	Simultaneous Inference 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 Qualitative Predictors
9	Building the Regression Model I: Model Section and Validation
10	Building the Regression Model II: Diagnostics
11	Building the Regression Model III: Remedial Measures