

**King Fahd University of Petroleum and Minerals**  
**Department of Mathematics**  
**MATH587: Advanced Applied Regression (Term 212)**

**Instructor:** Dr. Muhammad Riaz

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**Office Hours:** 4:00-5:00 pm (MS Teams)+ by appointment

**MATH 587 Advanced Applied Regression**

**(3-0-3)**

Least square method and properties. Simple and multiple linear regression with matrix approach. Development of linear models. Residual analysis. Polynomial models. Use of dummy variables in multiple linear regression. Analysis of variance approach. Selection of 'best' regression equation. Concepts of mathematical model building. Non-linear regression and estimation. Extensive use of computer packages.

**Prerequisites:** Graduate Standing, Consent of the Instructor

**Textbook(s):**

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

**Supplementary Books/Material:**

- Introduction to Linear Regression Analysis by Montgomery, Peck and Vinning, 5th edition, Wiley (2012).
- Agresti. Foundations of Linear and Generalized Linear Models, Wiley (2015).
- An Introduction to Statistical Learning with Applications in R by G. James, D. Witten, T. Hastie and R. Tibshirani, Springerlink 2013.

**Software:** MINITAB. ( Click here to download: <https://bit.ly/3IR6CuB> )

**Assessment**

Activity	Weight
Classwork	20%
Midterm Exam ( <b>Week 7-8(tentative)</b> )	25%
Project	20%
Final Exam (Comprehensive) ( <b>As per registrar office announcement</b> )	35%

**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.

**Attendance Notes:** In accordance with University rules, 20% unexcused absences will automatically result in a grade of DN.

**Missing an Exam:** In case a student misses an exam for a legitimate reason (such as medical emergencies), he/she must bring an official excuse from Students Affairs. Otherwise, he will get zero in the missed exam.

**Tentative list of Course Contents**

Topics	Title
0	Introduction to Statistics and approaches of statistical analysis
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
12	Advanced modelling methods