King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Dhahran, Saudi Arabia
STAT-413: Statistical Modelling (Term 232)

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Course Description: Simple and Multiple Linear Regression, Polynomial Regression, Splines; Generalized Linear Models, Generalized Additive Models; Hierarchical and Mixed Effects Models; Bayesian Modeling; Logistic Regression, Discriminant Analysis; Model Selection.

Course Objectives: Introduce statistical tools for modeling; develop models that learn from the observed data and implement statistical models based on the statistical analysis.

Textbook: An Introduction to Statistical Learning with Applications in R by R. Tibshirani
Applied Regression Analysis and Generalized Linear Models by John Fox
Foundations of Linear and Generalized Linear Models by A. Agresti

Assessment*

Activity	Weight
Class Participation (home works, quizzes, attendance, etc.)	10%
Project	15%
First Major Exam	20%
Second Major Exam	20%
Final Exam	35%

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 and major exams) 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.

Important Notes:
- ✓ Only University issued excuses will be accepted.
- ✓ ***Attendance*** on time is ***very*** important.
- ✓ Use of ***mobile*** is ***banned*** during the class.
- ✓ ***Homework*** problems will be assigned later.

Schedule

Week	Topics	Remarks
1	Statistical Learning: Introduction to R and other basic concepts	
2	Simple and Multiple Linear Regression: Parameter estimation, assessing the accuracy of the model as well as the parameters.	
3	Generalized Linear Models	
4	Generalized Linear Models	
5	Logistic Regression and Poisson regression	
6	Discriminant Analysis	
7	Polynomial Regression	
8	Splines	
9	Model Selection approaches and Resampling Methods	
10	Generalized Additive Models	
11	Generalized Additive Models	
12	Hierarchical and Mixed effects Models	
13	Hierarchical and Mixed effects Models	
14	Project Presentation	
15	Bayesian Modeling	