King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Dhahran, Saudi Arabia
STAT-413: Statistical Modelling (Term 242)

Instructor: Emmanuel Afuecheta **Office:** 5-320
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Office Hours: Mon: 10am-12noon and Wed: 2pm- 4pm

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%

Important Notes: .

Excuse: Only an excuse issued by ***Deanship of Student Affairs*** will be accepted for not attending a class, a quiz or an exam.

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.

Important Notes:

- Students will be required to carry a scientific calculator ***with statistical functions*** to ***every class, quiz, and exam***.
- We will explain the R commands in the class and the student is free to do his homework anywhere he likes.
- No student will be allowed to take the exam if not having his/her KFUPM ID or National/Iqama ID cards.
- Students are not allowed to carry mobiles, smart watches, or electronic devices to the

exam halls/rooms.

- Students must adhere to the attendance policy of KFUPM
- In accordance with University rules, a ***DN*** grade will be awarded to any student who accumulates up to 20% (9) unexcused absences or more than 33% (15) excused and unexcused absences of lectures and labs. It is students' responsibility to provide valid written excuses on time before a ***DN*** report is issued.
- A ***DN*** grade will be assigned to the eligible student after being warned twice by his/her instructor.
- ***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 lateness*** equals to one absence.
- All contacts or announcements between the instructor and the students are supposed to be held on Blackboard, so the student ***must*** check his Blackboard inbox ***at least once*** a day.

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	Simple and Multiple Linear Regression: Parameter estimation, assessing the accuracy of the model as well as the parameters.	
4	Simple and Multiple Linear Regression: Parameter estimation, assessing the accuracy of the model as well as the parameters.	
5	Simple and Multiple Linear Regression: Parameter estimation, assessing the accuracy of the model as well as the parameters.	
6	Generalized Linear Models	
7	Generalized Linear Models	
8	Logistic Regression and Poisson regression	
9	Discriminant Analysis	
10	Polynomial Regression	
11	Splines	
12	Model Selection approaches and Resampling Methods	
13	Generalized Additive Models	
14	Generalized Additive Models	
15	Hierarchical and Mixed effects Models (If time permits)	
15	Hierarchical and Mixed effects Models (If time permits)	
	Project Presentation	
15	Bayesian Modeling (If time permits)	