King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
STAT 413: Statistical Modeling - Term 212 (3-0-3)

Course Description:

Simple and Multiple Linear Regression, Polynomial Regression, Splines; Generalized Additive Models; Hierarchical and Mixed Effects Models; Bayesian Modeling; Logistic Regression, Generalized Linear Models, 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.

Textbooks:

An Introduction to Statistical Learning with Applications in R by R. Tibshirani (available online)
Applied Regression Analysis and Generalized Linear Models by John Fox

Instructor: Dr. Ali N. Duman **Office:** Bldg – 5, room – 325. **Phone:** 013 - 860 2632
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Office Hours: UTR: (09:00-10:00am) or by appointment

Assessment

Assessment for this course will be based on attendance, term report, major exam and a comprehensive final exam, as follows:

Activity	Weight
Attendance, Participation	10%
Quizzes	15%
Group Project	35%
Exam	15%
Final Exam (Comprehensive)	25%

IMPORTANT NOTE on GRADES: There is no quota on the number of students who can get an A+ or other grades.

- ✓ ***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 late (**2 lates= 1 Absence**) and
- ✓ **More than 10 minutes late = Absence** (regardless of any excuse).
- ✓ Only University Blue paper Official excuses will be accepted as valid excuse.

Letter grade	A+	A	B+	B	C+	C	D+	D	F	DN
Cut-off	90%	85%	80%	75%	67%	60%	55%	50%	<50%	≥ 9 absences

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

Tentative Schedule

Week	Topics	*Notes*
1	Statistical Learning	
2	Simple and Multiple Linear Regression: Parameter estimation, assessing the accuracy of the model as well as the parameters.	
3	Logistic Regression	
4	Discriminant Analysis	
5	Resampling Methods	
6	Model Selection approaches	
7	Polynomial Regression	
8	Splines	
9	Generalized Additive Models	
10	Generalized Linear Models	
11	Generalized Linear Models	
12	Hierarchical and Mixed Effects Models	.
13	Hierarchical and Mixed Effects Models	
14	Bayesian Modeling	
15	Bayesian Modeling	