King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics

STAT310: Linear Regression
Fall Semester 2016 (Term 161)

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Office: 5-333
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Office Hours (Tentative): UTR. 10:10 am – 11:50 am, or by appointment

Course Objectives: Present the basics of regression analysis


Learning Outcomes: At the end of the term a student should be able to

- Find and interpret least square estimates of parameters
- Thoroughly understand and use the single linear regression model
- Thoroughly understand, build and use the multiple linear regression
- Perform hypothesis tests and construct confidence intervals in linear regression models
- Test the appropriateness of models, and analyze data

Assessment*

<table>
<thead>
<tr>
<th>Activity</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Class Participation (home works, quizzes, attendance, etc.) + Project</td>
<td>10% + 5%</td>
</tr>
<tr>
<td>First Major Exam (Chapters 1, 2 and 3)</td>
<td>15%</td>
</tr>
<tr>
<td>Second Major Exam (Chapters 4, 5 and 6)</td>
<td>20%</td>
</tr>
<tr>
<td>Third Major Exam (Chapters 7, 8 and 9)</td>
<td>20%</td>
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<tr>
<td>Final Exam (Comprehensive) Thursday January 19, 2017, 7:00 pm</td>
<td>30%</td>
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Grade Assignment

<table>
<thead>
<tr>
<th>Score</th>
<th>Grade</th>
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<tbody>
<tr>
<td>87 – 100</td>
<td>A+</td>
</tr>
<tr>
<td>80 – 86.9</td>
<td>A</td>
</tr>
<tr>
<td>75 – 79.9</td>
<td>B+</td>
</tr>
<tr>
<td>70 – 74.9</td>
<td>B</td>
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<tr>
<td>65 – 69.9</td>
<td>C+</td>
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<tr>
<td>60 – 64.9</td>
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<td>D+</td>
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<tr>
<td>50 – 54.9</td>
<td>D</td>
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<tr>
<td>0 – 49.9</td>
<td>F</td>
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Academic Integrity: All KFUPM policies regarding ethics and academic honesty apply to this course.

Important Notes:

- Excessive unexcused absences will result in a grade of DN in accordance with University rules.
- Attendance on time is very important.
- Check Blackboard regularly for announcements.
- Homework will be assigned later, and is due in class on the first Sunday after we finish a chapter.

Your Responsibilities:

- Taking all exams.
- Attending all lectures.
- Completing all homework problems posted on the Blackboard.
- Reading all my e-mails in a timely manner, i.e. check your e-mail every day.
- Asking for help when you need it and not waiting until the end of the semester.
- Practice active learning instead of waiting until the day before an exam to attempt to learn the material.
# Syllabus

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Exceptions</th>
</tr>
</thead>
</table>
| 1    | Chapter 1  
Introduction |  |
| 2-3  | Chapter 2  
Simple Linear Regression |  |
| 4-6  | Chapter 3  
Multiple Linear Regression  
3.4.3 Simultaneous Confidence Intervals on Regression Coefficients |  |
| 7-8  | Chapter 4  
Model Adequacy Checking |  |
| 9    | Chapter 5  
Transformation and Weighting to Correct Model Inadequacies  
5.6 Regression Model with Random Effects |  |
| 10   | Chapter 6  
Diagnostics for Leverage and Influence |  |
| 11   | Chapter 7  
Polynomial Regression Models  
7.3 Nonparametric Regression  
7.5 Orthogonal Polynomials |  |
| 12   | Chapter 8  
Indicator Variables |  |
| 13   | Chapter 9  
Multicollinearity |  |
| 14   | Chapter 10  
Variable Selection and Model Building |  |
| 15   | Project Presentations |  |