King Fahd University of Petroleum and Minerals

Department of Mathematics

STAT 201 Lab Syllabus, Term 252

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Course Title: Probability and Statistics for Engineers and Scientists

Course Credit Hours: 3-1-3

Objectives:

This Lab of STAT 201 is designed to help the students in the following ways:

1. To easily understand and appreciate the practicability of the concepts taught in the STAT 201 curriculum.
2. To develop their ability to properly analyze and solve probability and statistics problems, and reasonably interpret their results.
3. To learn how to use R in solving a wide range of statistical problems in the real world, since statistics has a lot of applications in almost all fields of life.

Assessment:

Assessment for this Lab will be based on two lab exams, as follows:

	Date	Time and Place	Material	Points
Midterm (MCQ)	Week 8	Your regular lab time	Ch#1 to Ch#4	10 points
Final Exam (MCQ)	Week 15		All Labs	20 points
Total				**30 points**

Attendance:

Students are expected to attend all lectures and labs.

- If a student misses a class/lab, he/she is **responsible for any announcement** made in that class/lab.
- After being warned **twice** by the instructor, **a DN grade** will be awarded to any student who accumulates
  - 12 unexcused absences combined in lecture and lab. **(20%)**
  - 20 excused and unexcused absences combined in lecture and lab. **(33%)**

Usage of Mobiles in Class:

Students are not allowed to use mobiles for any purpose during class time. Students who want to use electronic devices to take notes must get permission from their instructor. Violations of these rules will result in a penalty decided by the instructor.

Details and guidelines for Exams:

- We will use RStudio by logging in to our labs.
- Check Blackboard regularly for announcements.
- All exams will be conducted using the blackboard.
- All test dates will be announced in the BB, this is students' responsibility to remember the test dates.
- Final lab exam will be comprehensive.
- We expect you to abide by all ethical rules and work individually.

Policy on Lab Examinations

- During lab examinations, students are permitted to use only the following:
  - Blackboard (restricted to the exam page only), used to access and submit the exam,
  - Approved software required for the exam: RStudio for STAT 201.
- Opening any additional Blackboard pages, browser tabs, windows, AI tools, files, or software applications is strictly prohibited.
- Any student found in violation of this policy will have their exam immediately terminated, and the incident will be treated as a case of cheating.
- No student will be allowed to take the exam if he/she does not bring his/her KFUPM ID, or National/Iqama ID, or Driver's License with him/her to the exam location.
- Students are not allowed to have their mobiles, smart watches, or any electronic device in the exam location. A violation of this will be considered an attempt of cheating.

Missing an Exam:

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

Academic Integrity:

All KFUPM policies regarding ethics apply to this course. See the Undergraduate Bulletin on the Registrar's website.

Week	Topic	Related material in the manual
Week 1	**Introduction to R: part 1**	1
Week 2	**Introduction to R: continue** **Descriptive Statistics: computing Numerical Measures by R**	1 2
Week 3	**Descriptive Statistics:** Frequency table, Graphs and charts for categorical and numerical data	2
Week 4	**Catch up and Practice LAB: Solving questions**	
Week 5	**Discrete Probability Distributions by R:** Binomial, Hypergeometric, & Poisson Distributions.	3
Week 6	**Continuous Probability Distributions by R:** Exponential, Normal distribution.	4
Week 7	**Continuous Probability Distributions by R (continued):** Weibull, and Lognormal Distributions.	4
Week 8	**Lab Midterm Exam (Thu 5 March):** Material: Ch 1 TO ch4 (Exponential and normal only)	
Week 9	**Sampling Distributions** of Sums and Means and the Central Limit Theorem	5
Week 10	**Confidence Intervals (by R)** for the Population Mean, and for Population Proportion.	6
Week 11	**Hypothesis Testing by R**	7
Week 12	**Simple Linear Regression by R:** Scatter diagram, Correlation coefficient, Estimating the line of best fit, Sources of variation, Checking the model assumptions, Confidence Interval estimation of regression parameter, Prediction Interval (PI) for future observation, Testing the slope of the regression line	8
Week 13	**Practice LAB: Solving questions**	
Week 14	**Multiple Linear Regression by R:** Multiple Linear Regression Model, Hypothesis Tests in Multiple Linear Regression, Confidence Intervals in Multiple Linear Regression, Prediction of New Observations, Residual Analysis	8
Week 15	**Lab Final Exam (Thu 7 May):** **Material: Comprehensive**	