

King Fahd University of Petroleum and Minerals

Department of Mathematics

STAT 201 Lab Syllabus, Term 253

Coordinator: Raid Anabosi (anabosir@kfupm.edu.sa)

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.
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Assessment:

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

Exam	Date	Time	Material	Points
Midterm (MCQ)	Week 4 (7 or 8 Jul.)	Your regular lab time	Lab 1 to Lab 4	10 points
Final (MCQ)	Week 8 (2 or 3 Aug.)		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
 - 10 unexcused absences combined in lecture and lab. (**20%**)

- 16 excused and unexcused absences combined in lecture and lab. (**33%**)
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Usage of Mobiles in Class or Lab:

Students are not allowed to use mobiles for any purpose during class or Lab 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.
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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.
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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.

Coverage Plan

Week	Topic	Section
Week 1	Introduction to R Introduction to R	1.1 1.2
Week 2	Descriptive Statistics: Graphical description of data (by R) Stem and Leaf Plot, Frequency table, Histogram, Shapes of distributions. Empirical Rule, Descriptive Statistics: Numerical Measures (by R) Common measures of location: Mean, Median, Mode. Common Measures of variation: Range, Percentiles and Quartiles, IQR, Variance, Standard Deviation	2.3 - 2.5 2.7
Week 3	The Box – Plot (by R): Shapes of distributions and the outlier Discrete Probability Distributions (by R): Binomial, Hypergeometric, & Poisson Distributions	2.8 3.1 - 3.4
Week 4	Continuous Probability Distributions (by R): Exponential, Normal distribution, Weibull, Lognormal Distributions Lab Midterm Exam: Descriptive Statistics and Probability Distributions Sampling Distributions of Sums and Means and the Central Limit Theorem	4.1 - 4.2 5.1
Week 5	Confidence Intervals (by R) for the Population Mean, and for Population Proportion. Hypothesis Testing (by R) for the Population Mean,	6.2 & 6.4 7.2
Week 6	Hypothesis Testing (by R) for Population Proportion Solving questions about C.I and testing by R	7.4
Week 7	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 a future observation, Testing the slope of the regression line and Multiple Linear Regression (by R)	8.1 - 8.5 8.6 - 8.9
Week 8	Lab Final Exam: Comprehensive	