

King Fahd University of Petroleum & Minerals

Department of Mathematics

STAT214 Syllabus, Semester 261 (2026-2027)

Coordinator: Mr. Mohammad Saleh (email: mohfarah@kfupm.edu.sa)

Course Code & Title: STAT-214: ACTUARIES AND BUSINESS STATISTICS

Course Credit Hours: 3-2-4

Textbook: Basic Business Statistics: Concepts and Applications, 12th edition, by Berenson, M.L., Levine, D.M., and Krehbiel, T.C., Pearson-Prentice Hall (2011)

Course Description:

Descriptive Statistics: Graphical and numerical measures. Elementary Probability theory; sampling techniques; probability distributions; estimation; hypothesis testing for means and variances; index number and introductory time series analyses; simple linear regression and correlation analysis; multiple regression analysis; the chi-squared and F distributions and their applications; application for financial decisions; application using statistical packages.

Note: Not to be taken for credit with STAT 201.

Prerequisite: MATH 102 or MATH 106

Course Objectives:

1. Introduce basic concepts of statistics methods to actuary students.
2. Emphasize the understanding of the nature of randomness of real-world problems. T

he formulation and analysis of real-world problems using well known statistical methods to make meaningful decisions.

Course Learning Outcomes: Upon the completion of the course, students should be able to

1. Discuss the importance of data collection in business statistics and actuarial science.
2. Summarize data using common graphical tools as well as describing data using numerical measures
3. Determine the probabilities of event outcomes in business statistics by analyzing the sample space of random experiments.
4. Compute the mean, variance, and probabilities for both discrete and continuous distributions.

5. Use confidence intervals and hypothesis testing to estimate the unknown population mean and proportion.
6. Understand the significance of the sample correlation coefficient and apply simple and multiple linear regression to model real-life problems, including the estimation and testing of model parameters
7. Explain what is meant by a contingency (or two-way) table and use a chi-square test to test the independence of two classification criteria.

Grading Policy:

	Date	Time	Place	Material	Points /300
Exam I	TBA	TBA	TBA	Chapters 2, 3, 4, 5	(70 points) 23.33%
Exam II	TBA	TBA	TBA	Chapters 6, 7, 8, 9	(70 points) 23.33%
Final Exam	As per registrar website			Comprehensive	(100 points) 33.33%
Lab Work (See Lab syllabus)	Assessments: Midterm Exam: 10 points, Date: TBA Final Exam: 20 points, Date: TBA				(30 points)
Class Work	- It is based on quizzes, class tests, or other class activities determined by the instructor. - The average (out of 30/ out of 45) of the class work of each section has to be in the interval $[y - 1.5, y + 1.5]$, where$y = \frac{3}{20}(\text{median}(\text{Exam I})\% + \text{median}(\text{Exam II})\%).$				(30 points)
Total					100 % (300 points)

Letter Grades: Final letter grades will be assigned according to a grading curve, which will be determined based on the overall performance of all students enrolled in the course. The exact cutoffs may change from one term to another, depending on how the scores are distributed.

Exam Questions: Exam questions will be similar in style and level of difficulty to the examples and exercises provided in the textbook.

Examination Policies: You are expected to adhere to KFUPM policies for all examinations in this course, including quizzes, major exams, midterms, and final exams. The following policies are enacted in this course during examinations:

- Students are expected to arrive at the examination hall on time with proper University ID.

- Students are seated according to the instructor's seat assignment and may request a seat change only for legitimate reasons.
- Late arrival to the exam may result in the student being denied admission. Once a student has completed the examination and left the examination hall/room, no late student will be admitted.
- Students are not permitted to leave the examination room to use the restroom during an exam, except in rare cases involving a documented medical condition (e.g., diabetes, kidney disease). Any excused restroom leave will be fully supervised by a same-gender proctor.
- Students must leave all smart devices outside the examination hall, including smartphones, smartwatches, earbuds, and unauthorized calculators. Possession of any unauthorized device will be considered a cheating attempt and will be handled accordingly.
- Cheating attempts will be reported according to KFUPM policy and will result in a DN grade in the course, along with potential further penalties upon investigation.

Missing an Exam: In case a student misses an exam (Exam I, Exam II, or the Final Exam) for a legitimate reason (such as medical emergencies), the student must submit an official excuse approved by the Deanship of Student Affairs within **seven calendar days** of the missed exam date. Without an approved excuse, the student will receive a score of zero for the missed exam. When the excuse is accepted, the coordinator will arrange a makeup exam for the missed exam.

Class Attendance: Students are expected to arrive on time for class, consistent with expectations in professional settings. Recording attendance for another student, signing another student's attendance, or asking another student to record yours will be reported for investigation and may result in severe consequences for both students involved.

A DN grade will be given after two warnings if a student exceeds 12 unexcused absences in lectures and labs (20% of the course) or exceeds a total of 20 absences in lectures and labs, whether excused or not (one-third of the course).

Use of Mobile Devices in Class: The use of mobile phones during class is strictly prohibited. Students who wish to use laptops or tablets for notetaking must first obtain permission from the instructor. Any violation will result in a penalty determined by the instructor.

Academic Integrity: All KFUPM academic integrity policies apply to this course. For details, students should refer to the Undergraduate Bulletin available on the Registrar's website.

Accessibility and Accommodations: Students with documented special needs, approved by the Deanship of Student Affairs, should contact the course coordinator to arrange reasonable accommodation.

Honor code: Students of this course are expected to maintain the highest level of academic integrity and ethics. A KFUPM student does not cheat or tolerate those who do. Every student is expected to submit work that is entirely their own, to properly cite all sources used, and to refrain from any form of academic misconduct.

Plagiarism: Use of another person's ideas, processes, results, or words requires appropriate credit or reference to the author. Use of Generative AI tools is subject to the instructor's authorization. Submitting the same work in more than one course without the instructor's permission is not allowed.

Suggested Weekly Coverage Plan

Week	Date (2026)	Sec.	Topics
1	Aug. 19 - 20	2.2	Organizing Categorical Data
		2.3	Organizing Numerical Data
		2.4	Visualizing Categorical Data.
		2.5	Visualizing Numerical Data.
3	Aug. 30 - Sept. 3	3.1	Central Tendency (Mean, Median & Mode)
		3.2	Variation and Shape.
		3.3	Exploring Numerical Data.
		3.4	Numerical Descriptive Measures for a Population.
		3.1	Central Tendency (Mean, Median & Mode)
4	Sept. 6 - 10	4.1	Basic probability concepts.
		4.2	Conditional Probability.
		4.3	Bayes' Theorem.
5	Sept. 13 - 17	5.1	Probability distribution for discrete random variable.
		5.3	Binomial distribution.
		5.4	Poisson Distribution
		5.5	Hypergeometric Distribution
6	Sept. 20 - 22	6.1	Continuous Random Variables (PDF, mean, Variance & percentiles) (Extra material)

		6.2	Normal distribution
		6.5	Exponential Distribution
	Sept. 23 - 24	Wednesday - Thursday: National Day	
7	Sept. 27 - Oct. 1	7.1	Types of Sampling Methods
		7.3	Sampling Distributions.
		7.4	Sampling Distribution of the Mean
		7.5	Sampling Distribution of the Proportion
8	Oct. 4 - 8	8.1	Confidence interval Estimate of the Mean (σ known)
		8.2	Confidence interval Estimate of the Mean (σ unknown)
		8.3	Confidence interval Estimate for the Proportion
		8.4	Determining Sample Size
9	Oct. 11 - 15	9.1	Fundamentals of Hypothesis-Testing Methodology
		9.2	t Test of Hypothesis for the Mean (σ Unknown)
		9.3	One-Tail Tests
10	Oct. 18 - 19	9.4	Z Test of Hypothesis for the Proportion
	Oct. 20 - 22	Tuesday - Thursday: Midterm Break	
11	Oct. 25 - 29	10.1	Comparing the Means of Two Independent Populations
		10.2	Comparing the Means of Two Related Populations
12	Nov. 1 - 5	10.3	Comparing the Proportions of Two Independent Populations
		10.4	F Test for the Ratio of Two Variances
		12.1&12.3	Chi-square test for independence (contingency (or two-way) table)
13	Nov. 8 - 12	13.1	Types of Regression Models
		13.2	Determining the Simple Linear Regression Equation
		13.3	3 Measures of Variation
14	Nov. 15 - 19	13.4&13.5	Assumptions & Residual Analysis
		13.7	Inferences About the Slope and Correlation Coefficient
		13.8	Estimation of Mean Values and Prediction of Individual Values
15	Nov. 22 - 23	Sunday - Monday: Autumn Break	
	Nov. 24 - 26	14.1	Developing a Multiple Regression Model
16	Nov. 29 - Dec. 3	14.2	R ² , Adjusted R ² , and the Overall F Test
		14.4	Inferences Concerning the Population Regression Coefficients
		16.2	Component of Time-Series
17	Dec. 6 - 10	16.3	Smoothing an Annual Time Series
		16.4	Least-Squares Trend Fitting and Forecasting (The Linear Trend Model)

		16.8	Index Numbers
	Final Exam: Comprehensive		

Suggested Practice Problems

Sr.	Ch	Exercises #
1	2	2.5, 2.11, 2.22, 2.24, 2.27, 2.37, 2.39, 2.44
2	3	3.3, 3.4, 3.8, 3.13, 3.23, 3.28 3.30, 3.39, 3.40, 3.63
3	4	4.3, 4.8, 4.14, 4.17, 4.19, 4.23, 4.31, 4.37, 4.61
4	5	5.1, 5.3, 5.19, 5.23, 5.24, 5.30, 5.33, 5.42, 5.43
5	6	6.1, 6.5, 6.6, 6.9, 6.29, 6.33, 6.51
7	7	7.18, 7.19, 7.20, 7.21, 7.25, 7.27, 7.45
7	8	8.5, 8.9, 8.12, 8.23, 8.30, 8.32, 8.38, 8.43, 8.48
8	9	9.2, 9.6, 9.8, 9.14, 9.16, 9.18, 9.24, 9.26, 9.36, 9.40, 9.44, 9.48, 9.50, 9.54, 9.58, 9.72
9	10	10.2, 10.10, 10.12, 10.20, 10.30, 10.32, 10.36, 10.38, 10.46
10	12	12.2, 12.3, 12.6
11	13	13.1, 13.2, 13.4, 13.16, 13.26, 13.40, 13.42, 13.55, 13.56, 13.58
12	14	14.1, 14.2, 14.6, 14.10, 14.16
13	16	16.1, 16.2, 16.3, 16.4, 16.10, 16.12 (a, b), Online topic (index numbers): 16.67, 16.69