KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

MATHEMATICS DEPARTMENT

STAT-211: Business Statistics I (Term 213)

Instructor: **Office:**
Phone: **E-mail:** @kfupm.edu.sa
Office Hours:

Check Blackboard regularly for announcements

Course Description: Introduce basic concepts of probability and statistics to business students. Emphasize the understanding of the nature of randomness of real world problems, the formulation of statistical methods using intuitive arguments and thereby make meaningful decisions.

Course Leaning Outcomes (CLOs)

By completing this course, students should be able to:

1. Distinguish between a sample and a population and between a statistic and a parameter and classify business data into the most appropriate type and measurement levels.
2. Organize, manage, and present data.
3. Analyze statistical data graphically and analyze statistical data using measures of central tendency, dispersion, and location manually and by MINITAB.
4. Demonstrate an understanding of the basic concepts of probability and random variables. and explain the basic probability rules, including additive and multiplicative laws, using the terms, independent and mutually exclusive events and calculate expected values for continuous and discrete probability distribution models.
5. Recognize and use the correct probability distribution model for a particular business application manually and by MINITAB.
6. Understand the concept of the sampling distribution of a statistic, and in particular describe the behavior of the sample mean.
7. Understand the foundations for classical inference involving confidence intervals manually and by MINITAB.

Textbook, package and calculator:

1. Basic Business Statistics: Concepts and Applications, 12th edition, by Berenson, M.L., Levine, D.M., and Krehbiel, T.C., Pearson-Prentice Hall (2011).
2. MINITAB (http://www.minitab.com/en-us/products/minitab/)

Assessment*

Activity	Weight
Class work: Attendance, Homework or other class activities determined by the instructor	5%(20 marks)
Lab work	5%(20 marks)
Quizzes: The average of each section should be in the interval [28, 30], i.e., [70%, 75%] of 40 marks	10%(40 marks)
Exam 1 (Chapters 1, 2, 3, and 4) Week 3 (Thursday, June 23, 2022)	25%(100 marks) 20 Questions
Exam 2 (Chapters 5, 6, and 7) Week 5 (Saturday, July 23, 2022)	25%(100 marks) 20 Questions
Final Exam (Comprehensive) Follow the final exam schedule on registrar webpage.	30%(120 marks) 24 Questions

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

Learning Objectives: By completing this course, students should be able to

- **Distinguish** between a *sample* and a *population*
- **Distinguish** between a *statistic* and a *parameter*
- **Classify** business data into the most appropriate *type and measurement levels*
- **Distinguish** between *continuous* and *discrete* data
- **Calculate** *summary descriptive statistics* manually and by MINITAB
- **Interpret** the correct *meaning of summary statistics* for particular real-life business problems
- **Graph** a *correct graphical display* for the correct type of data manually and by MINITAB
- **Interpret** the *correct meaning of graphical display* for a particular real-life business problems
- **Choose** the *correct graphical display* for a particular business decision
- **Choose** the *correct summary statistics* for a particular business application
- **Assess** the correct probability for a particular business application manually and by MINITAB
- **Calculate** the probability for different types of regular business events (marginal, conditional, and joint events) and for updated posterior business events
- **Calculate** expected values of future business events
- **Recognize and use** the correct probability distribution model for a particular business application manually and by MINITAB
- **Distinguish** between *continuous* and *discrete* probability distribution models
- **Distinguish** between *distribution for sample data, distribution for population data, and distribution for sample statistics*
- **Understand** the role of *central limit theorem* in the distribution of sample statistics
- **Evaluate** the *correctness and error levels* of a procedure for estimating a population parameter
- **Design** a business data collection effort by finding the *minimum necessary sample sizes* manually and by MINITAB
- ***Estimate*** *parameters* of a business population of interest manually and by MINITAB
- **Choose** the most *appropriate statistical procedure* for a particular type and measurement level of business data

Tentative Syllabus

Week	Topics	Homework problems
Week 1 June 5 - 9	1.1 Why Learn Statistics. 1.2 Statistics in Business. 1.3 Basic Vocabulary of Statistics. 1.4 Identifying Types of Variables. 2.2 Organizing Categorical Data. 2.4 Visualizing Categorical Data. 2.3 Organizing Numerical Data. 2.5 Visualizing Numerical Data. 2.6 Visualizing Two Numerical Data.	Chapter 1: 1.1, 1.5, 1.7, 1.11, 1.25, 1.27 Chapter 2: 2.5, 2.11, 2.20, 2.22, 2.24, 2.27, 2.37, 2.39, 2.44, 2.46
Week 2 June 12 - 16	3.1 Central Tendency. 3.2 Variation and Shape. 3.3 Exploring Numerical Data. 3.4 Numerical Descriptive Measures for a Population	Chapter 3: 3.3, 3.4, 3.8, 3.13, 3.23, 3.28 3.33, 3.39, 3.40, 3.63
Week 3 June 19 - 23	4.1 Basic probability concepts 4.2 Conditional Probability 4.3 Bayes' Theorem 5.1 Probability distribution for discrete random variable,	Chapter 4: 4.3, 4.8, 4.14, 4.17, 4.19, 4.23, 4.31, 4.37, 4.61
Week 4 June 26 - 30	5.3 Binomial distribution. 5.4 Poisson Distribution 5.5 Hypergeometric Distribution 6.1 Continuous Probability distributions.	Chapter 5: 5.1, 5.3, 5.19, 5.23, 5.24, 5.30, 5.33, 5.42, 5.43
July 3 - 14	HAJJ HOLIDAYS	
Week 5 July 17 - 21	6.2 Normal distribution. 6.4 Uniform Distribution. 6.5 Exponential Distribution 6.6 Normal Approximation to the Binomial.	Chapter 6: 6.1, 6.5, 6.6, 6.9, 6.23, 6.29, 6.33, 6.51
Week 6 July 24 - 28	7.3 Sampling Distributions. 7.4 Sampling Distribution of the Mean 7.5 Sampling Distribution of the Proportion. 8.1 Confidence interval Estimate of the Mean (σ known)	Chapter 7: 7.18, 7.19, 7.20, 7.21, 7.25, 7.27, 7.45
Week 7 July 31-Aug. 4	8.2 Confidence interval Estimate of the Mean (σ unknown) 8.3 Confidence interval Estimate for the Proportion 8.4 Determining Sample Size 10.1 Confidence interval Estimate for the Difference Between Two means	Chapter 8: 8.5, 8.9, 8.12, 8.23, 8.30, 8.32, 8.38, 8.43, 8.48
Week 8 August 7 -8	10.2 Confidence interval Estimate for the Mean Difference. 10.3 Confidence interval Estimate for the Difference Between Two Proportions	Chapter 10: 10.12 (c), 10.14 (d), 10.20 (d), 10.23 (d), 10.29 (c & d)

General Notes:

- Students are required to carry **pens**, **binder** and a **calculator** with statistical functions to **EVERY lecture.**
- Students are also expected to take class notes and organize their learning material in a binder for easy retrieval to help them in study and review for class, exams, etc. It is to the student's advantage to keep a binder for storing class notes, homework, and other graded assignments. Students who are organized will find it easier to find important materials when studying for exams.
- To effectively learn statistics, students need to *solve problems* and *analyze data*. The selected assigned problems are specifically designed to prepare you for class quizzes, lab, majors and final exam. So, it is expected that you complete these problems *step-by-step* and with *comprehension*.
- ***Never round*** your intermediate results to problems when doing your calculations. This will cause you to lose calculation accuracy. Round only your final answers and you should not round less than 4 decimal places unless required otherwise.
- ***A formula sheet*** and ***statistical tables*** will be given for you in every exam, so you only need to bring with you ***pens***, ***pencils***, ***a sharpener***, ***an eraser***, and a ***calculator***.

Important Notes:

- Students are not allowed to carry mobile phones and smart watches to the exam halls.
- Students will be required to carry a scientific calculator ***with statistical functions*** to ***every class, quiz, and exam***.
- In accordance with University rules, ***Nine (9) unexcused absences*** ***or*** ***Fifteen (15) excused and unexcused absences*** will automatically result in a grade of ***DN***. It is students' responsibility to provide valid written excuses on time before a ***DN*** report is issued.
- ***Attendance*** on time is ***very*** important.
- Students are expected to attend all lecture classes.
- If a student misses a class, he is responsible for any announcement made in that class.
- Mostly, attendance will be checked within the ***first five minutes*** of the class. Entering the class after that, is considered as one late, and ***every two lateness*** equals to one absence.
- All contacts or announcements between the instructor and the students are supposed to be held on Blackboard, so the student ***must*** check his Blackboard inbox ***at least once*** a day.

Cheating and Plagiarism

This course is composed of individual assignments. It is important that your individual assignment be completed with your own efforts instead of copying it from your fellow student. KFUPM instructors follow "zero tolerance" approach with regard to cheating and plagiarism. During examinations (quizzes, major exams, lab tests) cheating or any attempt of cheating by use of illegal activities, techniques and forms of fraud will result in a "grade of F" in the course along with reporting the incident to the higher university administration.

Missing an Exam:

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), he must bring an official excuse from Students Affairs. Otherwise, he will get zero in the missed exam."

MINITAB

Commands and procedures will be explained in the class and the student are expected to practice them during and after the class