King Fahd University of Petroleum and Minerals
Department of Mathematics
STAT-211: Business Statistics I (T223)

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Office Hours: UMTW 11:00 – 12:00 noon

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	10%(40 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, and 3) (July 13, 2023)	25%(100 marks) 20 Questions
Exam 2 (Chapters 4, 5, and 6) Week 5 (July 30, 2023)	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	Suggested problems
Week 1 June 11 – 15	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.	**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 18 – 22	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 July 09 – 13	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 July 16 – 20	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**
Week 5 July 23 – 27	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 30 – Aug 03	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 Aug 6 – 10	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 Aug 13 – 14	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)**

Remarks:

1. ***Mobiles and Smart Watches***
   - Students are not allowed to use mobiles for any purpose during class time.
   - Students who want to use electronic devices to take notes must take permission from their instructor.
   - Violations of these rules will result in a penalty decided by the instructor.
   - Academic Integrity: All KFUPM policies regarding ethics apply to this course. See the Undergraduate Bulletin.
   - **Students are not allowed to carry mobile phones and smart watches to the exam halls**.

2. ***Cheating in Exams:***
   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 for further action. Cheating in exams includes (but is not limited to):
   - looking at the papers of other students
   - talking to other students
   - using mobiles or any other electronic devices **including smart watch**.

3. ***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.

4. ***Attendance***:
   Students are expected to attend all lecture classes.
   - If a student misses a class, he is responsible for any announcement made in that class.
   - A DN grade will be awarded to any student who accumulates
     - 20% unexcused absences (7 lectures)
     - 33% excused and unexcused absences (12 lectures)

5. ***Homework:***
   - To successfully learn statistics, students need to solve problems and analyze data. The selected assigned problems are specifically designed to help you understand the material.
   - *homework problems will be posted on the Blackboard*
   - No late homework will be accepted.

6. ***Tips on how to enhance your problem-solving abilities:***
   - Do all homework assignments on time.
   - Practice (but not memorize) more problems than those in the above list.
   - Solve review problems available at the end of each chapter.
   - Solve the problems on your own before reading the solution or asking for help.
   - If you find it difficult to handle a certain type of problems, you should try more problems of the same type.
   - Practicing homework problems and reviewing the class lectures will make exam problems easier to tackle.
   - Try to make good use of the office hours of your instructor. Always bring partial solutions of the questions that you want to discuss with your instructor.