

King Fahd University of Petroleum and Minerals

Department of Mathematics and Statistics

STAT-211: Business Statistics I (Term 201)

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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.

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*
- **Design** a business *data collection effort* by using the most appropriate data sampling strategy
- **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

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 Participation (home works, attendance, bonuses, etc.) | 10% |
| Quizzes | 10% |
| Lab work | 10% |
| Online assessment 1 (Chapters 1, 2 and 3) Week 6: Oct. 6 at 5:45 pm | 15% |
| Midterm Exam (Chapters 4 and 5) Week 9: Oct. 20 at 8:00 pm | 15% |
| Online assessment 2 (Chapters 6 and 7) Week 12: Nov. 10 at 5:45 pm | 15% |
| Final Exam (Comprehensive) | 25% |

Grade Assignment

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|-------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|
| Score | 87 – 100 | 80 – 86.9 | 75 – 79.9 | 70 – 74.9 | 65 – 69.9 | 60 – 64.9 | 55 – 59.9 | 50 – 54.9 | 0 – 49.9 |
| Grade | A+ | A | B+ | B | C+ | C | D+ | D | F |

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

Syllabus

| Week | Section | Topics | |
|-----------------------------|--|---|--|
| Week 1 Aug 30 – Sep. 3 | 1.1 1.2 1.3 1.4 2.2 2.4 | Why Learn Statistics. Statistics in Business. Basic Vocabulary of Statistics. Identifying Types of Variables. Organizing Categorical Data. Visualizing Categorical Data. | |
| Week 2 Sep. 6 – Sep. 10 | 2.3 2.5 2.6 | Organizing Numerical Data. Visualizing Numerical Data. Visualizing Two Numerical Data. | |
| Week 3 Sep. 13 – Sep. 17 | 3.1 3.2 | Central Tendency. Variation and Shape. | |
| Week 4 Sep. 20 – Sep. 24 | 3.3 3.4 | Exploring Numerical Data. Numerical Descriptive Measures for a Population | 23 – 24 Sep. National Day Holidays |
| Week 5 | 4.1 | Basic probability concepts | |

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|--|-------------------|--|--------------------------------|
| Sep. 27 – Oct. 1 | 4.2 | Conditional Probability | |
| Week 6 Oct. 4 – Oct. 8 | 4.3 5.1 | Bayes' Theorem Probability distribution for discrete random variable, | |
| Week 7 Oct. 11 – Oct. 15 | 5.3 5.4 5.5 | Binomial distribution. Poisson Distribution Hypergeometric Distribution | |
| Week 8 Oct 18 – Oct. 22 | 6.1 | Continuous Probability distributions. | |
| Week 9 Oct 25 – Oct. 29 | 6.2 6.4 | Normal distribution. Uniform Distribution. | |
| Week 10 Nov. 1 – Nov 5 | 6.5 6.6 | Exponential Distribution Normal Approximation to the Binomial. | |
| Week 11 Nov. 8 – Nov. 12 | 7.3 7.4 7.5 | Sampling Distributions. Sampling Distribution of the Mean Sampling Distribution of the Proportion. | |
| Week 12 Nov. 15 – Nov. 19 | 8.1 | Confidence interval Estimate of the Mean (σ known) | |
| Week 13 Nov 22 – Nov. 26 | 8.2 8.3 8.4 | Confidence interval Estimate of the Mean (σ unknown) Confidence interval Estimate for the Proportion Determining Sample Size | |
| Week 14 Nov. 29 – Dec. 3 | 10.1 | Confidence interval Estimate for the Difference Between Two means | |
| Week 15 Dec. 6 – Dec. 10 | 10.2 10.3 | Confidence interval Estimate for the Mean Difference. Confidence interval Estimate for the Difference Between Two Proportions | |
| Week 16 Dec. 14 | | Review and Catchup | 14. Dec: Normal Thursday Class |

Important Notes:

● Lectures:

Because of the current COVID-19 situation, all lectures will be conducted online using **Blackboard Collaborate Ultra** or/and **Microsoft Teams**.

You need

- ✓ a computer (desktop or laptop) with a webcam and audio capabilities with Microsoft Teams installed.
- ✓ to install Microsoft Teams on your mobile phone.
- ✓ to have an excellent internet connection for attending virtual classes and attempting assessments. No makeup exams or attendance excuses will be given based on internet connection failure.

- ✓ to keep your webcam turned on and the proctor will monitor you time to time.
- ✓ a calculator with statistical functions.
- ✓ your book every class (soft/hard copy).
- ✓ to solve the suggested problems (will be uploaded to the blackboard at the beginning of each chapter).

● Class attendance policy:

- ✓ Attendance **on time** is very important.
 - Those who frequently face connection problems **will not be** considered present.
 - The student **must actively participate** in the lecture to be considered present.
 - During the class, if you need to get away from your computer, you need to take instructors permission.
 - Only an excuse issued by **Deanship of Student Affairs** will be accepted for not attending a class
- ✓ Excessive unexcused absences (**more than 8**) will result in a grade of **DN** in accordance with University rules.

● 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.

● MINITAB

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

● Details and guidelines for Assessments:

- ✓ All exams will be conducted online using the blackboard.
- ✓ You will be able to see it in the "Assessments / Tests" section.
- ✓ Online assessments 1 and 2 will **start exactly at 5:45 PM**, and you will have only 5 minutes to login to the assessment. Similarly, midterm will start at 8:00 PM.
 - It means **after 5:50 PM you cannot login** to take the assessment.
- ✓ We expect you to abide by all ethical rules and work individually.
- ✓ Each assessment may include more than one type of questions (MCQ, fill in the blank, solving, essays ...)
- ✓ No makeup assessment will be given for any reason.

● Homework

- ✓ homework problems will be posted on the Blackboard later.