



College of Business
Eco 578-31E: CRN 81064 Fall 2018

Statistical Methods: 8/27/2018- 12/14/2018

Professor: Dr. Kishor Kumar Guru-Gharana
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Office Hrs: MF: 9.55am-11:10am, W 12:00pm-2:00pm, and TR: 8:40am-9:30am at BA 208
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Preferred Form of Communication: email
Communication Response Time: within 24 hours
Class Hours: S 10:15am-12:55pm at ELCOP225 (Dallas)

Course Information

Required Text: Business Statistics, In Practice Bruce L. Bowerman, Richard T. O'Connell, Emily S. Murphree, McGraw-Hill Irwin, 7th edition (ISBN-13: 978-0073521497).

Software Required: Excel with Analysis Tool Pack (installation of Analysis Tool Pack is free).

Catalog Course Description: A course dealing with statistical concepts including measures of central tendency and dispersion, probability distributions, the Central Limit Theorem, Sampling, Estimation, Hypothesis testing, Analysis of Variance, Correlation and Regression analysis, Multiple Regression and Statistical Forecasting.

Course Objectives: The objective of this course is to provide an understanding for the graduate business student on statistical concepts to include measurements of location and dispersion, probability, probability distributions, sampling, estimation, hypothesis testing, regression, and correlation analysis, multiple regression and business/economic forecasting.

Student Learning Outcomes:

By completing this course, the student will able to:

- 1) Calculate and apply measures of location and measures of dispersion -- grouped and ungrouped data cases.
- 2) Apply discrete and continuous probability distributions to various business problems.
- 3) Perform Test of Hypothesis as well as calculate confidence interval for a population parameter for single sample and two sample cases. Understand the concept of p-values.
- 4) Learn non-parametric test such as the Chi-Square test for Independence as well as Goodness of Fit.

- 5) Compute and interpret the results of Bivariate and Multivariate Regression and Correlation Analysis, for forecasting and perform ANOVA and F-test. Further, understand both the meaning and applicability of a dummy variable and the assumptions which underline a regression model. Be able to perform a multiple regression using computer software.
- 6) Interpret regression results generated by a computer software.

Rubric:

Course objectives	1 Unsatisfactory	2 Emerging	3 Proficient	4 Exemplary
1) Learn to calculate and apply measures of location and measures of dispersion for grouped and ungrouped data.	Student cannot calculate and apply any measures of location and measures of dispersion for grouped and ungrouped data.	Student can calculate and apply some measures of location and measures of dispersion for grouped and ungrouped data.	Student can calculate and apply most measures of location and measures of dispersion for grouped and ungrouped data.	Student can calculate and apply all measures of location and measures of dispersion for grouped and ungrouped data.
2) Learn how to apply discrete and continuous probability distributions to various business problems.	Student cannot apply discrete and continuous probability distributions to any business problems.	Student can apply discrete and continuous probability distributions to some business problems.	Student can apply discrete and continuous probability distributions to most of business problems.	Student can apply discrete and continuous probability distributions to all of business problems.
3) Understand the hypothesis testing: 3.1 Be able to perform Test of Hypothesis 3.2 calculate confidence interval for a population parameter for single sample & two samples.	3.1 Student cannot perform the test of hypothesis 3.2 Student cannot calculate confidence interval for a population parameter for single sample and two samples.	3.1 Student can perform some test of hypothesis 3.2 Student can calculate some confidence interval for a population parameter for single sample and two samples.	3.1 Student can perform most test of Hypothesis 3.2 Student can calculate most confidence interval for a population parameter for single sample and two samples.	3.1 Student can perform all test of Hypothesis 3.2 Student can calculate all confidence interval for a population parameter for single sample and two samples.
3.3 Understand the concept of p-values.	3.3 Student doesn't understand the	3.3 Student understands some part of the	3.3 Student understands most part of the	3.3 Student understands the entire

	concept of p-value.	concept of p-value.	concept of p-values.	concept of p-values.
4) Learn non-parametric test such as the Chi-Square test for Independence and Goodness of Fit.	Student doesn't know non-parametric test such as the Chi-Square test for Independence and Goodness of Fit.	Student knows some parts of non-parametric test such as the Chi-Square test for Independence and Goodness of Fit.	Student knows most parts of non-parametric test such as the Chi-Square test for Independence and Goodness of Fit.	Student knows all parts of non-parametric test such as the Chi-Square test for Independence and Goodness of Fit.
5) Understand regression analysis: 5.1 Be able to compute and interpret the results of Bivariate Regression 5.2 Be able to compute and interpret the results of Multivariate Regression. 5.3 Be able to compute and interpret Correlation Analysis 5.4 Be able to perform ANOVA and F-test.	5.1 Student cannot compute and interpret the results of Bivariate Regression 5.2 Student cannot compute and interpret the results of Multivariate Regression 5.3 Student cannot compute and interpret Correlation Analysis 5.4 Student cannot solve any questions regarding ANOVA and F-test.	5.1 Student can compute and interpret some of the results of Bivariate Regression 5.2 Student can compute and interpret some of results of Multivariate Regression 5.3 Student can compute and interpret some parts of Correlation Analysis 5.4 Student can solve easy questions regarding ANOVA and F-test.	5.1 Student can compute and interpret most of the results of Bivariate Regression 5.2 Student can compute and interpret most of results of Multivariate Regression 5.3 Student can compute and interpret most parts of Correlation Analysis 5.4 Student can solve medium-hard questions regarding ANOVA and F-test.	5.1 Student can compute and interpret all of the results of Bivariate Regression 5.2 Student can compute and interpret all of results of Multivariate Regression 5.3 Student can compute and interpret all parts of Correlation Analysis 5.4 Student can solve difficult questions regarding ANOVA and F-test.

5.5 Be able to understand both the meaning and applicability of a dummy variable.	5.5 Student cannot apply the dummy variable to solve any questions.	5.5 Student can apply the dummy variable to solve some questions.	5.5 Student can apply the dummy variable to solve most questions.	5.5 Student can apply the dummy variable to solve all the questions.
5.6 Be able to understand the assumptions which underline a regression model.	5.6 Student doesn't understand the assumptions which underline a regression model.	5.6 Student understands some parts of the assumptions which underline a regression model.	5.6 Student understands most parts of the assumptions which underline a regression model.	5.6 Student understands all parts of the assumptions which underline a regression model.
5.7 Be able to perform a multiple regression using computer software.	5.7 Student is unable to perform a multiple regression using computer software.	5.7 Student is able to perform a multiple regression using computer software for easy questions	5.7 Student is able to perform a multiple regression using computer software for medium-hard questions	5.7 Student is able to perform a multiple regression using computer software for difficult questions

Course Requirements

Minimal Technical skills Needed

High school algebra; using Excel spreadsheet, Excel functions and Excel graphics; and using PowerPoint.

Instructional Methods: The professor/instructor will conduct live classes with writing on Blackboard/White Boards and live interactions. Moreover, the Professor will email power point slides with solved examples and explanations and also post them in YouSeeU. Questions can be asked in class, through appropriate forum of YouSeeU and through email.

Student Responsibilities/Tips for Success in the Course

1. Students are expected to:
 - a. Read text assignments as scheduled.
 - b. Read the chapter Instructions provided by the Professor.
 - c. Work the assigned homework problems independently. Submit the homework problems by due date as indicated in through YouSeeU or email as instructed in class.
 - d. Pay attention to the regular announcements in class, through YouSeeU and emails
2. This syllabus is tentative for the semester. It is meant to be a guide. Certain topics may be stressed more or less than indicated in the text books and, depending on class progress, and certain topics may be omitted.
3. Homework problems are assigned and graded every six weeks. Solution to Assignment problems will be provided after the deadline for submission.
5. Detailed Instructions with examples for each Chapter will be provided.
6. Feel free to ask questions through email or other online tools. I am accessible 24/7 through these channels even during weekends or holidays.
7. Demeanor: “All students enrolled at the university shall follow tenets of common decency and acceptable behavior conducive to a positive learning environment”. See Students Guide Book.
8. Attendance Policy: Regular class attendance is highly correlated with students’ performance in this class.

Grading

Grade Component	Points
Two Assignments (2*250)	500
Final Exam (Chapters 4-15)	500

Final grade in the course is the average from the student’s total score from the sum of (Assignments + Final) above.

Average Range	Grade
90%-100%	A
80%-89%	B
70%-79%	C
60%-69%	D
Below 60%	F

EXAMS SCHEDULE

Exam	starts	ends	Chapters Covered
Final Exam (7 hrs)	8 am Saturday, December 8 th , 2018	11:59 pm Monday, December 10 th , 2018	4, 5, 6, 7, 8, 9, 10, 13, 14, and 15

*Uploading will be done in the morning (8 a.m.) of the starting date. The Final has a three-day window period with time limit once you start the tests. It has a Seven-hour time limit. The Exam is a one-take Exam. That is, you must finish the Exam in a single take.

Mid-night (11:59 p.m.) of the Last Date. Start **at least 7 hours earlier than 11:59 p.m. of the last date for the Final.

myLeo Support

Your myLeo email address is required to send and receive all student correspondence. Please email helpdesk@tamuc.edu or call us at 903-468-6000 with any questions about setting up your myLeo email account. You may also access information at [myLeo](https://leo.tamuc.edu). <https://leo.tamuc.edu>

Learner Support

The [One Stop Shop](http://www.tamuc.edu/admissions/onestopshop/) was created to serve you by providing as many resources as possible in one location. <http://www.tamuc.edu/admissions/onestopshop/>

The [Academic Success Center](http://www.tamuc.edu/campusLife/campusServices/academicSuccessCenter/) provides academic resources to help you achieve academic success. <http://www.tamuc.edu/campusLife/campusServices/academicSuccessCenter/>

COMMUNICATION AND SUPPORT

Interaction with Instructor Statement

I generally respond to virtual office (or YouSeeU online equivalent) and email questions within 24 hours

COURSE AND UNIVERSITY PROCEDURES/POLICIES

. Course Specific Procedures/Policies

Missed examination: Missing Homework Assignment will result in zero score while missing the Final will result in grade "F". There will be no make-up Exam or make-up Assignment.

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

University Specific Procedures

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the [Student Guidebook](#).

<http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx>

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: [Netiquette](#)

<http://www.albion.com/netiquette/corerules.html>

TAMUC Attendance

For more information about the attendance policy please visit the [Attendance](#) webpage and [Procedure 13.99.99.R0.01](#).

<http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx>

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf>

Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

[Undergraduate Academic Dishonesty 13.99.99.R0.03](#)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf>

[Graduate Student Academic Dishonesty 13.99.99.R0.10](#)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf>

ADA Statement

Students with Disabilities

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
Texas A&M University-Commerce

Gee Library- Room 162

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: studentdisabilityservices@tamuc.edu

Website: [Office of Student Disability Resources and Services](#)

<http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/>

Nondiscrimination Notice

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the

[Carrying Concealed Handguns On Campus](#)

document and/or consult your event organizer.

Web url:

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf>

COURSE OUTLINE / CALENDAR

Chapter	Mode	Date/Due date Class starts on 9/1/2018	Chapter Goals
<u>Chapter 1</u> Introduction to Business Statistics	Class Lectures + Handouts + PPT slides + email attachments	September 1 st	<ol style="list-style-type: none"> 1. Inferential and descriptive statistics. 2. Quantitative and a Qualitative variables. 3. Four levels of measurement: - nominal, ordinal, interval, and ratio.
<u>Chapter 2</u> Descriptive Statistics: Tabular and Graphical Methods	Class Lectures + Handouts + PPT slides + email attachments	September 1 st	<ol style="list-style-type: none"> 1. Construct a frequency distribution. 2. Determine the class midpoints, relative frequencies, and cumulative frequencies of a frequency distribution. 3. Construct a Histogram, a Frequency Polygon, an Ogive, and a Pie Chart.
<u>Chapter 3</u> Descriptive Statistics: Numerical Methods	Class Lectures + Handouts + PPT slides + email attachments	September 1 st	<ol style="list-style-type: none"> 1. Mean, mode, and median. for both grouped and ungrouped data. 2. Range, mean deviation, variance, and the standard deviation for grouped and ungrouped data. 3. Empirical rules and Chebyshev rule 3. Skewness 4. Coefficient of variation.
<u>Chapter 4</u> Probability	Class Lectures + Handouts + PPT slides + email attachments	September 8 th	<ol style="list-style-type: none"> 1. Definition and Axioms of probability. 2. Marginal, conditional, and joint probabilities. 3. Special and general rules of multiplication and addition in probability computation. 4. Bayesian problems

<u>Chapter 5</u> Discrete Random Variables	Class Lectures + Handouts + PPT slides + email attachments	September 15 th	<ol style="list-style-type: none"> 1. Probability distribution and random variable. 2. Discrete and a Continuous variables. 3 The mean, variance, and standard deviation of a discrete distribution. 4. The binomial probability distribution – use of tables and computer. 5. The mean variance and standard deviation of a binomial distribution.
<u>Chapter 6</u> Continuous Random Variables	Class Lectures + Handouts + PPT slides + email attachments	September 22 nd	<ol style="list-style-type: none"> 1. The normal distribution – use of tables and computer 2. Use the Normal distribution as an approximation of the Binomial distribution.
<u>Chapter 7</u> Sampling Distributions	Class Lectures + Handouts + PPT slides + email attachments	September 29 th	<ol style="list-style-type: none"> 1. Various sampling techniques. 2. The Central Limit Theorem. 3. The sampling error. 4. The sampling distribution of the mean for known and unknown population variance 5. The sampling distribution of proportions
<u>Assignment 1</u> : Chapters 1, 2, 3, 4, 5, 6, and 7	Uploaded in YouSeeU and/or emailed	Sunday, October 7th, 2018 by 11:59 pm	Submit through YouSeeU or email as instructed in class

<u>Chapter 8</u> Confidence Intervals	Class Lectures + Handouts + PPT slides + email attachments	October 6 th	<ol style="list-style-type: none"> 1. The confidence intervals for sample means and sample proportions. 2. Describe the characteristics of Student's t distribution. 3. Use the Student's t probability table to calculate confidence interval
<u>Chapter 9</u> Hypothesis Testing	Class Lectures + Handouts + PPT slides + email attachments	October 13 th	<ol style="list-style-type: none"> 1. Type I and Type II errors. 2. Hypothesis test about population mean and proportion- one and two tailed tests 3. Hypothesis test regarding one population mean with a small sample.
<u>Chapter 10</u> Two sample Statistical Inferences	Class Lectures + Handouts + PPT slides + email attachments	October 20 th	Test of hypothesis about the difference between two population means and proportions
Chapter 13 Chi-square Tests	Class Lectures + Handouts + PPT slides + email attachments	October 27 th	<ol style="list-style-type: none"> 1. The χ^2 goodness-of-fit test. 2. The χ^2 test of independence. 3. The χ^2 test on Contingency Tables
<u>Chapter 14</u> Simple Bivariate Linear Regression Analysis	Class Lectures + Handouts + PPT slides + email attachments	November 3 rd and November 10 th	<ol style="list-style-type: none"> 1. The relationship between independent and dependent variables-Scatter plot, Covariation and Covariance 2. Coefficient of correlation, coefficient of determination and the standard error of the estimate. 3. Assumptions of Classical Linear Regression Model 4. The least squares regression line 5. Statistical significance test. 6. Confidence interval and prediction interval for the mean

			and an individual value of the dependent variable.
<u>Chapter 15</u> Multiple Regression	Class Lectures + Handouts + PPT slides + email attachments	November 17 th and 24 th	<ol style="list-style-type: none"> 1. The relationship between two or more independent variables and the dependent variable using a multiple regression equation. 2. The standard error of the estimate and the coefficient of determination. 3. Hypothesis tests to determine significance of regression coefficients 4. ANOVA and F-Test
Assignment 2 (Chapters 8, 9, 10, 13, 14 & 15)	Uploaded in YouSeeU and/or emailed	Sunday, November 25th, 2018 by 11:59 pm	Submit through YouSeeU or Email as instructed in class
Final Exam: Time limit 7 hrs. (Single Take Exam)	Uploaded in YouSeeU and/or emailed	Window period 8 am Saturday, December 8th till 11:59 pm Monday, December 10th, 2018	Chapters 4, 5, 6, 7, 8, 9, 10, 13, 14, & 15 Submit through YouSeeU or Email as instructed in class