BA 302-01E: Business and Eco Statistics [CRN # 20216]
Course Syllabus (Spring 2015): 1/20/2015 - 5/15/2015

Professor: Dr. Kishor Kumar Guru-Gharana
Office: BA 208
Office Hours: Mon-Wed-Fri 12:00 P.M. -1:30 P.M. and Tue-Thu 10:50 – 11:50 P.M. at BA 208
Class Hours: MWF 11:00 A.M.-11:50 A.M. Location: BA 256
Phone: 903.886.5687 (off); 903.886.5601) (fax)
Email: kishor.guru-gharana@tamuc.edu

Required Text:

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, correlation and regression analysis.

Course Prerequisites:
Prerequisites: (Lvl U MATH 141 Min Grade C or Lvl U MATH 111 Min Grade C or Lvl U MATH 1314 Min Grade C) or (Lvl U MATH 176 Min Grade C or Lvl U MATH 1324 Min Grade C)

Course Objectives: Student Learning Outcomes

The objective of this course is to provide an understanding for the undergraduate 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. By completing this course the student will learn to perform the following:

1) How to calculate and apply measures of location and measures of dispersion.
2) How to apply discrete and continuous probability distributions to various business problems.
3) To understand the meaning of a null and an alternative hypothesis as well as the meaning of type I and type II error. Further, to perform test of hypothesis as well as calculate confidence interval for a population parameter for a single mean, including use of the “t” and the “Z” tests.
4) Compute and interpret the results of Bivariate Regression and Correlation Analysis.
5) Be able to interpret regression results generated by a computer software.

Rubric

<table>
<thead>
<tr>
<th>Criteria (Course Objectives)</th>
<th>1 (Unsatisfactory)</th>
<th>2 (Emerging)</th>
<th>3 (Proficient)</th>
<th>4 (Exemplary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How to calculate and apply measures of location and measures of dispersion.</td>
<td>Student cannot calculate and apply any measures of location and measures of dispersion.</td>
<td>Student can calculate and apply some of the measures of location and measures of dispersion.</td>
<td>Student can calculate and apply most of the measures of location and measures of dispersion.</td>
<td>Student can calculate and apply all of the measures of location and measures of dispersion.</td>
</tr>
<tr>
<td>2. How to apply discrete and continuous probability distributions to various business problems.</td>
<td>Student cannot apply discrete and continuous probability distributions to any problems.</td>
<td>Student can apply of discrete and continuous probability distributions to some problems.</td>
<td>Student can apply of discrete and continuous probability distributions to most of the problems.</td>
<td>Student can apply discrete and continuous probability distributions to all the problems.</td>
</tr>
</tbody>
</table>
3. Understand the Hypothesis Testing: Understand the meaning of a null and an alternative hypothesis

3.2 Understand the meaning of type I and type II error.

3.3 Be able to perform test of hypothesis

3.4 Be able to calculate confidence interval for a population parameter for a single mean, including use of the t and the z test.

3.1 Student doesn’t understand the meaning of a null and an alternative hypothesis
or
3.2 Student doesn’t understand the meaning of type I and type II error.

3.3 Student cannot perform test of hypothesis
or
3.4 Student is able to perform some test of hypothesis

3.5 Student is able to calculate confidence interval for a population parameter for a single mean, including use of the t and the z test (2 out of 4)

3.6 Student is able to calculate confidence interval for a population parameter for a single mean, including use of the t and the z test (3 out of 4)

4. Compute and interpret the results of Bivariate Regression and Correlation Analysis.

4.1 Student cannot compute and interpret the results of Bivariate Regression and Correlation Analysis.

4.2 Student can compute and interpret some of the results of Bivariate Regression and Correlation Analysis.

4.3 Student can compute and interpret most of the results of Bivariate Regression and Correlation Analysis.

4.4 Student can compute and interpret all of the results of Bivariate Regression and Correlation Analysis.

5. Be able to interpret regression results generated by computer software.

5.1 Student cannot interpret regression results generated by a computer software

5.2 Student can fairly interpret regression results generated by a computer software

5.3 Student can interpret regression results generated by a computer software well

5.4 Student can interpret regression results generated by a computer software excellently

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 132
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
StudentDisabilityServices@tamuc.edu

Statement of Ethical and Professional Conduct:
The College of Business and technology at Texas A&M University – Commerce faculty, staff and students will follow the highest level of ethical and professional behavior. We will strive to be recognized as a community with legal, ethical and moral principles and to teach and practice professionalism in all that we do. In an academic environment we will endeavor to not only teach these values but also to live them in our lives and daily work. Faculty and staff will be held to the same standards and expectations as our students.

Failure to abide by these principles will result in sanctions up to and including dismissal.

Actionable Conduct:
These are five different types of actions that will bring sanction. They are:
1. Illegal activity: Violation of any local, state or federal laws that prohibit the offender from performance of his or her duty.
2. Dishonest conduct: Seeking or obtaining unfair advantage by stealing or receiving copies of tests or intentionally preventing others from completing their work. In addition falsifying of records to enter or complete a program will also be considered dishonest conduct.
3. Cheating: The unauthorized use of another’s work and reporting it as your own.
4. Plagiarism: Using someone else’s ideas and not giving proper credit.
5. Conclusion: Acting with others to perpetrate any of the above actions regardless of personal gain.
Sanctions:
In the case of staff or faculty the immediate supervisor will be the arbiter of actionable behavior and will use Texas A&M University Commerce and/or Texas A&M University System Policy and Procedures as appropriate to guide sanctions.

Faculty, guided by clearly delineated policy in the course syllabus, will be arbiter for in-class violations. All violations will be reported to the dean of the college of Business and technology to assure equity and to provide appropriate counsel. In addition, the Dean will maintain the records of violations by students. Second violations will be reviewed by the Dean and sanctions beyond those of the faculty up to and including suspension and permanent expulsion from Texas A&M University – Commerce will be considered. Faculty and students are guided by the current undergraduate and graduate catalogs of the university as well as The Students Guidebook.

Faculty, Staff and Students will always be afforded due process and review as appropriate.

Grading Policy:

<table>
<thead>
<tr>
<th>Grade Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four Home ASSIGNMENTS</td>
<td>4 * 300 = 1200</td>
</tr>
<tr>
<td>MIDTERM EXAM (Chaps. 1,2,3,5, 6 and 7)</td>
<td>300</td>
</tr>
<tr>
<td>FINAL EXAM (Chaps. 6,7,8,9,10, and 13)</td>
<td>400</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Average Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90%-100%</td>
<td>A</td>
</tr>
<tr>
<td>80%-89%</td>
<td>B</td>
</tr>
<tr>
<td>70%-79%</td>
<td>C</td>
</tr>
<tr>
<td>60%-69%</td>
<td>D</td>
</tr>
<tr>
<td>Below 60%</td>
<td>F</td>
</tr>
</tbody>
</table>

**EXAMS SCHEDULE**

<table>
<thead>
<tr>
<th>Exams</th>
<th>Exams Uploaded on</th>
<th>Due by</th>
<th>Chapters Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-Term Exam (Six hours)</td>
<td>6 p.m. Sunday, March 15th, 2015</td>
<td>11:59 p.m. Sunday, March 15th, 2015</td>
<td>1, 2, 3, 5, 6 and 7</td>
</tr>
<tr>
<td>Final Exam (Seven hrs.)</td>
<td>5 p.m. Sunday, May 10th, 2015</td>
<td>11:59 p.m. Sunday, May 10th, 2015</td>
<td>8, 9, 10 and 13</td>
</tr>
</tbody>
</table>

**NOTE THE FOLLOWING:**

1. Feel free to ask questions through email. I am accessible 24/7 even during weekends or holidays. You can ask any question related to the course topics and I try to answer them within few hours (maximum 24 hours).

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, certain topics may be omitted.

3. Homework problems are assigned and graded every third week. Solution to Assignment problems will be provided after the deadline for submission.

4. 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 Exams or make-up Assignments.

5. I provide detailed Instructions with examples for each Chapter. I also provide power point slides for the chapters covered in the course.

6. Students are expected to:
   a. Read text assignments as scheduled.
   b. Read the chapter Instructions and the power point slides provided by the Professor.
   c. Work the assigned homework problems independently. Submit the homework problems through email by the due date/time.

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: In the online course there is no class attendance. But assignments and tests have corresponding due dates.

10. **Excel** will be used to solve numerical problems along with calculator and formulas.
## Topical Outline and Schedule of Assignments:

The schedule will depend on class progress. Chapter assignments and tests may be altered as the class progresses. Students should read chapters and power point slides, and chapter Instructions provided by the Professor.

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Modes of Instruction</th>
<th>Date/Due date</th>
<th>Chapter Goals</th>
</tr>
</thead>
</table>
| **Chapter 1** | What is Statistics | Class lectures/ Handouts/email | Jan 20- Feb 9 | 1. Understand why we study Statistics  
2. Explain what is meant by descriptive statistics and inferential statistics  
3. Distinguish between qualitative and quantitative variables  
4. Describe how a discrete variable is different from a continuous variable  
5. Distinguish among the nominal, ordinal, interval, and ratio levels of measurement. |
| **Chapter 2** | Describing Data: Frequency tables, Frequency Distributions, and Graphic Presentations | Class lectures/ Handouts/email | Jan 20- Feb 9 | 1. Organize qualitative data into a frequency table.  
2. Present a frequency table as a Bar Chart or a Pie Chart.  
3. Organize quantitative data into a frequency distribution.  
4. Present a frequency distribution for quantitative data using histograms, frequency polygons, and cumulative frequency polygons. |
| **Chapter 3** | Describing Data: Numerical measures | Class lectures/ Handouts/email | Jan 20- Feb 9 | 1. Calculate the arithmetic mean, weighted mean, median, mode, and geometric mean.  
2. Explain the characteristics uses, advantages, and disadvantages of each measure of location.  
3. Identify the position of the mean, median, and mode for both symmetric and skewed distributions.  
4. Compute and interpret the range, mean deviation, variance, and standard deviation.  
5. Understand the characteristics, uses, advantages, and disadvantages of each measure of dispersion.  
6. Understand Chebyshev’s theorem and the Empirical rule as they relate to a set of observations. |
| **Assignment 1** | (Chapters 1, 2 and 3) | Emailed to the class | Monday, Feb 9, 2015 by 11:59 pm |  |
| **Chapter 4** | A Survey of Probability Concepts | Class lectures/ Handouts/email | Feb 9- March 9 | 1. Define probability.  
2. Describe the Classical, Empirical, and Subjective approaches to probability.  
3. Explain the terms experiment, event, outcome, permutations, and combinations  
4. Define the terms conditional probability and joint probability.  
6. Calculate the probability using Bayes’ Theorem. |
| **Chapter 5** | Discrete Probability Distributions | Class lectures/ Handouts/email | Feb 9- March 9 | 1. Define probability distribution and random variable.  
2. Differentiate between discrete and continuous probability distributions.  
3. Calculate the mean, variance, and standard deviation of a discrete distribution.  
4. Describe the characteristics and compute probabilities using the binomial probability distribution – use of tables and computer.  
5. Describe the characteristics and compute probabilities using the Poisson distribution – use of tables. |
| **Chapter 6** | Continuous Probability Distributions | Class lectures/ Handouts/email | Feb 9- March 9 | 1. Understand the difference between discrete and continuous probability distributions.  
2. Understand the characteristics of the normal probability distribution.  
3. Define and calculate Z values.  
4. Determine the probability is between two points on a normal probability distribution.  
5. Determine the probability an observation is above or below a point on a normal probability distribution.  
6. Use the normal probability distribution to approximate the binomial probability distribution. |
| **Assignment 2** | (Chapters 5, 6, 7) | Emailed to the class | Monday, March 9 by 11:59 pm |  |
| **Midterm Exam** | Time Limit: 6 hours | Emailed to the class | 6 p.m. Sunday, March 15th, 2015 till 11:59 p.m. Sunday, March 15th, 2015 | Chapters 1, 2, 3, 5, 6 and 7 |
| **Spring break** | Spring break | March 16-22 | |  |
### Chapter 8: Sampling Methods and the Central Limit Theorem
- **Class lectures/Handouts/email**
- **March 23- April 13**
- 1. Explain why a sample is often the only feasible way to learn something about a population.
- 2. Describe methods to select a sample.
- 3. Define and construct a sampling distribution of the sample mean.
- 4. Understand and explain the central limit theorem.
- 5. Use the central limit theorem to find probabilities of selecting possible sample means from a specified population.

### Chapter 9: Estimation and Confidence Intervals
- **Class lectures/Handouts/email**
- **March 23 - April 13**
- 1. Define a point estimate.
- 2. Define level of confidence.
- 3. Construct a confidence interval for a population mean when the population standard deviation is unknown: learn about t-distribution.
- 4. Construct a confidence interval for a population proportion.
- 5. Calculate the required sample size for either an attribute or a variable.

### Assignment 3 (Chaps. 7 and 8)
- **Emailed to the class**
- **Monday, April 13th, 2015 by 11:59 pm**

### Chapter 10: One Sample Test of Hypothesis
- **Class lectures/Handouts/email**
- **April 13- May 4**
- 1. Define Hypothesis and Hypothesis testing.
- 2. Describe the five step hypothesis-testing procedure.
- 3. Distinguish between a one-tailed and a two-tailed test of hypothesis.
- 4. Conduct a hypothesis test regarding a population mean.
- 5. Conduct a test of hypothesis about a population proportion.
- 6. Define Type I and Type II errors.

### Chapter 13: Linear Regression and Correlation
- **Class lectures/Handouts/email**
- **April 13- May 4**
- 1. Understand and interpret the terms independent and dependent variables.
- 2. Calculate and interpret coefficient of correlation, the coefficient of determination and the standard error of the estimate.
- 3. Calculate the least squares regression line and interpret the slope and intercept values.
- 4. Conduct tests of significance on the regression coefficients.
- 5. Learn about prediction of dependent variable using regression.

### Assignment 4
- **Emailed to the class**
- **Monday, May 4th by 11:59 pm**

### Final Exam: Time limit 7 hours
- **Emailed to the class**
- **5 p.m. Sunday, May 10th, 2015 till 11:59 p.m. Sunday, May 10th, 2015**
- **Chapters 8, 9, 10, and 13**

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**The window period for the Final starts at 8 am on Saturday and ends at 11:59 pm on Tuesday**

**HOME WORK PROBLEMS TO BE TURNED IN:** The Home Assignments are to be turned in by the **Midnight** of the due date also indicated on top of each posted Assignment. **NO LATE SUBMISSION WILL BE ACCEPTED**

<table>
<thead>
<tr>
<th>Chapters</th>
<th>Problem(s)</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapters 1-3</td>
<td>Assignment 1 (emailed to the class)</td>
<td>Monday, February 9 by 11:59 pm</td>
</tr>
<tr>
<td>Chapters 5-7</td>
<td>Assignment 2 (emailed to the class)</td>
<td>Monday, March 9 by 11:59 pm</td>
</tr>
<tr>
<td>Chapters 8-9</td>
<td>Assignment 3 (emailed to the class)</td>
<td>Monday, April 13 by 11:59 pm</td>
</tr>
<tr>
<td>Chapters 10 &amp; 13</td>
<td>Assignment 4 (emailed to the class)</td>
<td>Monday, May 4 by 11:59 pm</td>
</tr>
</tbody>
</table>