STATISTICS 206
ELEMENTARY STATISTICS FOR BUSINESS

BULLETIN INFORMATION
STAT 206 – Elementary Statistics for Business (3 credit hrs)
Course Description:
Fundamental statistical methods with applications in business. Includes descriptive statistics, graphical methods, probability, distributions, sampling, inference, contingency tables, and linear regression.
Pre-requisite: MATH 111 or higher, or consent of department.

SAMPLE COURSE OVERVIEW
The purpose of STAT 206 is to give students in business fields a non-calculus based introduction to the application of modern statistical methods including descriptive and inferential statistics, and to show students that statistics is an important research tool within business.

ITEMIZED LEARNING OUTCOMES
Upon successful completion of STAT 206, students will be able to:
1. Evaluate and create common graphical displays and summary statistics for data from multiple sources.
2. Demonstrate understanding of and apply the rules of probability to solve basic problems involving sets, discrete random variables and continuous random variables.
3. Identify basic probability distributions and express their basic characteristics.
4. Explain and apply principles of statistical hypothesis testing, including Type I and II errors in one and two sample problems.
5. Construct, describe and interpret confidence intervals and hypothesis tests in one and two-sample problems.
6. Apply sample size calculations to one and two-sample problems to design experiments.
7. Demonstrate understanding of the simple linear regression model and least squares estimation equation.
8. Evaluate assumptions in the normal-errors model with diagnostic graphs.
9. Construct and interpret confidence intervals and analyze tests of hypotheses for slope in the simple linear regression model.
10. Conduct analysis of statistical methods with business applications in statistical computing packages such as R, SAS or Minitab.

SAMPLE REQUIRED TEXTS/SUGGESTED READINGS/MATERIALS
1. **Textbooks:** Berenson, M.L., Levine, D.M., and Szabat, K.A. (2015). Basic Business Statistics Concepts and Applications, 13th Ed. Black, K. (2014). Business Statistics for Contemporary Decision Making, 8th Ed.

2. **Calculator and Computer:** Each student will need a scientific calculator and access to the internet to complete homework assignments and print off notes and readings. *No graphing calculators allowed.* Computers are located throughout DMSB; use your Blackboard username and password to log-in. Statistical software (such as Minitab, R, and SAS), Excel and/or applets will be demonstrated in class throughout the semester for implementing the methods covered. Any of these required for homework sets are available in DMSB labs, while R is also available as a free download.

SAMPLE ASSIGNMENTS AND/OR EXAMS
1. **Homework and Class Participation**: Homework will allow students to demonstrate understanding and practical use of basic course principles, to test their ability to identify and properly formulate probability and statistical problems in context, and correctly apply and interpret statistical hypothesis tests. Students will be required to construct, describe and interpret common graphical displays and summary statistics for both quantitative and qualitative data. Computing assignments in the homework will be used to test students' abilities to evaluate and interpret relationships among variables and test statistical model assumptions, and to assist students in analysis of data through descriptive and graphical summaries of data, and output from statistical tests and models. iClickr technology may be used during class to ensure comprehension of basic principles and concepts.
Homework covering the concepts taught in the class will be posted regularly in Blackboard throughout the semester. Students will submit their answers online. A date and time for closing each assignment will be announced in class and appear on each assignment. *No late assignments will be accepted.* You may discuss homework with other students, but each student must submit their assignment independently. In addition to regularly scheduled office hours, assistance on coursework is also available in the Statistics Tutoring Center in 215A LeConte. Hours for the Tutoring Center will be announced in class.
2. **Exams** (Two in-class exams): The in-class exams will test understanding of statistical principles, definitions of fundamental rules, laws, construction, and interpretation and evaluation of computing output. The exams will evaluate students on their ability to use graphical, descriptive and inferential methods to summarize variables and relations among variables. In-class exams will also test students on their ability to identify and properly formulate probability and statistical problems in context, and correctly apply and interpret statistical hypothesis tests.
3. Dates for in-class exams are listed in the Course Outline. All work on exams must be independent. Make-up exams will be considered only in extreme circumstances and a doctor's note/legitimate excuse will be required. Contact the instructor as soon as possible if you think your situation merits a makeup.
4. **Final Exam**: The final exam for this course will be comprehensive and will test learning outcomes similar to those tested in the semester exams. The exam will be administered according to the university exam schedule. All work on the final exam must be independent.

SAMPLE COURSE OUTLINE WITH TIMELINE OF TOPICS, READINGS/ ASSIGNMENTS, EXAMS/PROJECTS

(Sections refer to Black, 2014, Business Statistics for Contemporary Decision Making)

Class 1: Course expectations, statistics in business, basic statistical concepts. Sections 1.1, 1.2

Class 2: Variables and data, data measurement, introduction to statistical computing. Sections 1.3, 1.4

Class 3: Frequency distributions, quantitative data graphs. Sections 2.1, 2.2

Class 4: Measures of central tendency and variability. Sections 3.1, 3.2

Class 5: Relationships between variables, descriptive statistics on the computer. Sections 2.4, 3.5

Class 6: Introduction to probability. Sections 4.1, 4.2

Class 7: Structure of probability, probability laws. 4.3, 4.4, 4.5

Class 8: More probability laws. Sections 4.6, 4.7, 4.8

Class 9: Continuous and discrete random variables. Sections 5.1, 5.2

Class 10: Binomial and Poisson distributions, Sections 5.3, 5.4. Review for Exam I.

Class 11: Exam I - Material on Classes 1-10.

Class 12: Normal Distribution. Section 6.2

Class 13: Normal distribution, normal approximation to binomial. Sections 6.2, 6.3

Class 14: Sampling. Section 7.1

Class 15: Sampling distribution of sample mean. Section 7.2

Class 16: Estimation, SE of the mean, CI for the population mean. Section 8.2

Class 17: Sampling distribution of sample proportion, estimating the population proportion. 7.3, 8.3

Class 18: Hypothesis testing. Section 9.1. Review for Exam II

Class 19: Exam II - Material on Classes 12-18.

Class 20: Hypothesis testing. Sections 9.3, 9.4

Class 21: Type I & II errors, power, and sample size. Sections 8.5, 9.6

Class 22: Two-sample hypothesis tests: t tests. Section 10.2

Class 23: Two-sample hypothesis tests: permutation tests. Section 17.2

Class 24: Inference for two related populations. Sections 10.5, 17.3

Class 25: Chi-square tests for goodness-of-fit and independence. Sections 16.1, 16.2

Class 26: Correlation, simple regression analysis. Sections 12.1, 12.2

Class 27: Simple Regression Analysis. Sections 12.3, 12.4

Class 28: Simple Regression Analysis. Sections 12.6, 12.7

Final Exam according to University exam schedule