PREREQUISITE: Math 311 equivalent or permission1058
T&Th, 2:30-3:45 Bouillon Hall 101 or 103 PC Lab

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Office Hours: M&W 2:30-3:30, T&Th 10-10:50, and by appointment

STUDENT OUTCOMES: Students will gain a *thorough and correct* understanding of basic statistical inference from their first course, and will also achieve an *in-depth* study of linear and multiple regression analysis. Students will learn the concepts and applications of nonparametric statistical methods.

ATTENDANCE: To achieve success in *any* mathematics class, **regular attendance is almost imperative**.

INCOMPLETES: An "I" is appropriate *only* if you have finished most course requirements, and can complete the course without re-enrolling. (Example: missing the final exam due to illness.) The course must be completed within a year; otherwise, the "I" reverts to an "F."

TESTING AND GRADING: There will be two 100-point take-home exams, and a FINAL exam worth 100 points. You will have to work individually and in groups on regression problems and you will then present your analyses interactively in class toward the end of quarter. You will also be graded on worksheets, classroom participation and attendance, which counts 300 points. You will explore statistical research topics and submit your project abstract. This makes a total of 700 points.

PROJECT:

One of the main course goals is for you to do a complete statistical research project, beginning with the design of the experiment, and progressing through the data collection, the analysis, and finally the write-up and presentation. Due to the short period of project time (less than 2 quarters), you are advised to use pre-existing data available through online and library resources, to design and formulate your research. The final project write-up will be due in spring if you continue to Math 410B course. It should in the format of no less than 10 pages, double spaced paper that gives the project summary, statistical methods, data sources, data display, statistical analysis, conclusion, future research, and the references. Projects presented (either oral or poster presentation) at the undergraduate research symposium SOURCE (May 2014) will receive substantially higher mark in grading. In the past years, almost every student in this class has taken the advantage by participating in the SOURCE research symposium and felt accomplished and beneficial to their job qualifications. The abstract deadline for presentations at SOURCE is in April. Abstracts may be submitted via the web.

TEXT: Statistics, by McClave and Sincich, Prentice Hall, 12th Edition. This book is non-mathematical and covers the important topics for both this and the next quarter. I will supplement this book in certain areas. You are held accountable for reading the textbook and ask questions in class and office hours. In the past, students have gained guidance and new ideas for the project topics from reading and attempting the advanced exercises from the textbook.

COMPUTER and STATISTICAL SOFTWARE: There are three heavily used statistical packages: SAS, S-Plus, MINITAB, and SPSS. Professional statisticians and industries use SAS or S-Plus. Social science workers use SPSS. MINITAB is a very nice compromise choice. While not as powerful as SAS, it is powerful enough to do most real-world applications. What really makes it stand out is *ease of use*. We have recently upgraded the lab machines in Bouillon 103 to the full-blown,

high-powered version. If you feel a strong affinity to another statistical package, feel free to use it. All in-class demonstrations, however, will use MINITAB. Students also have accesses to the software Eviews, commonly used in business for regression models and forecasts.

MATERIAL TO BE COVERED: Because of your varied backgrounds, we will review material from your first stat course by using in-class and take-home worksheets. The concept of a sampling distribution is the most important idea for any of you who will ever use statistics. For this reason, we will ask you to review the material in Chapter 6-9 to be sure you have a good foundation.   I hope to spend at least half of the quarter on Chapters 11 and 12 with a considerable amount of supplementation and problems for your in-class presentation. I will introduce nonparametric statistics in the last two weeks in order to broaden your statistical knowledge and skill set for your very own SOURCE project.

Week	**Topic and Assignment**
1. 1/6-1/10	Central Limit Theorem Sampling Distribution Worksheets 1, 2, 3
2. 1/13-1/17	Comprehensive Review--Inference WS 4, 5
3. 1/20-1/24	Exam 1: Review Inferential Stat (Take Home) Simple Linear Regression WS 6, 7, 8, 9
4. 1/27-1/31	Exam 2: Simple Linear Regression (Take Home)
5. 2/3-2/7	WS 10, 11 (Transform) Multiple Regression: Lecture
6. 2/10-2/14	Multiple Regression WS 12, 13, 14, 15
7. 2/17-2/21	Multiple Regression WS 16, 17, 18
8. 2/24-2/28	Multiple Regression: Presentation
9. 3/3-3/7	Nonparametric statistics WS 19
10. 3/10- 3/14	Nonparametric statistics WS 20
11. 3/17-3/21	Final Oral Exam, Abstract due

The Final Oral Exam Date will be announced

LEARNING PERFORMANCE EVALUATION

Assessment Method	Value
20 Worksheets	300 pts
1 Presentation	50
2 Take-home exams	200
Abstract	50
Final Exam	100
Total	700 pts

Final grades will be assigned according to the following scale:

A 100-93%   **A-** 92.9-90%
B+ 89.9-87%   **B** 86.9-83%   **B-** 82.9-80%
C+ 79.9-77%   **C** 76.9-73%   **C-** 72.9-70%
D+ 69.9-67%   **D** 66.9-63%   **D-** 62.9-60%
F 59.9% and below