MATHEMATICS 410B
ADVANCED STATISTICAL METHODS II, SPRING 2014

PREREQUISITE: Math 410A or equivalent or permission.
Tuesday, Thursday 2:30 – 3:45 P.M., (Bouillon 101, 103)

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Office hours: MTWTh 11:00-11:50, and by appointments

STUDENT OUTCOMES FOR MATH 410B:

This course is designed to help students acquire in-depth statistical and mathematical knowledge of analysis of variance, design of experiments, goodness-of-fit techniques, and simulation methods.

ATTENDANCE:

To achieve success in *any* mathematics class, **regular attendance is almost imperative**. Unlike most subjects, new topics in statistics build on previous knowledge; failure to learn something early will haunt you throughout the course. There will be some topics and techniques I introduce that are NOT covered in the book. You will be responsible for these.

PROJECT:

One of the main course goals is for you to do a complete project, beginning with the design of the experiment, and progressing through the data collection, the analysis, and finally the write-up and presentation. The project write-up should in the format of a 10-page, double spaced paper that gives the project summary, statistical methods, data sources, data display, statistical analysis, and conclusions. Projects presented (either oral or poster presentation) at the undergraduate research symposium SOURCE (http://www.cwu.edu/~source/) in May tend to receive high mark. In the past years, almost the entire class participated in the SOURCE research symposium and felt accomplished. The abstract deadline for presentations at SOURCE is early April but students are advised to submit early for timely approval. Abstracts should be submitted via the web early to ensure the opportunity.

TESTING AND GRADING: You will be asked to maintain a course portfolio that contains the in-calss worksheets, notes, handouts, and test papers for quarter end evaluation. The two tests will be take-home and the final exam will be in class. The project presentation can be scheduled during the SOURCE week and the written paper is due in the last week. Students must take final exam and turn in a complete project in order to pass this course.

- Homework and course portfolio (150 points)
- Two take-home tests (100 points)
- Project (150 points)
- Final exam (100 points)

Total 500 points

Average: 100-93 92-90 89-87 86-83 82-80 79-77 76-73 72-70 69-67 66-63 62-60 Below 60

Grade: A A- B+ B B- C+ C C- D+ D D- F

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.

COMPUTER: There are three heavily used statistical packages: SAS, MINITAB, and SPSS. Professional statisticians use SAS. 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.

Tentative Schedule (Any change will be announced in class.)

Week	**Reading Assignment**
1. 4/2-4/4	Chapter 10 Analysis of variance 10.1-10.2
2. 4/7-4/11	10.3-10.4
3. 4/14-4/18	10.5 **Test 1 (ANOVA)**
4. 4/21-4/25	Chapter 13 Categorical Data Analysis (so called goodness-of-fit techniques) 13.1-13.2
5. 4/28-5/2	13.3-13.4
6. 5/5-5/9	Research Project
7. 5/12-5/16	SOURCE
8. 5/19-5/23	**Test 2 (Categorical Data Analysis)**
9. 5/24-5/28	Nonparametric Statistics
10. 5/26-5/30	Nonparametric Statistics
11. 6/2-6/6	Nonparametric Statistics
12. 6/9-6/12	**FINAL EXAM covering Nonparametric Statistics**