# Math 425 – Statistical Methods

**Course Description from Bulletin:** Concepts and methods of gathering, describing and analyzing data including basic statistical reasoning, basic probability, sampling, hypothesis testing, confidence intervals, correlation, regression, forecasting, and nonparametric statistics. No knowledge of calculus is assumed. This course is useful for students in education or the social sciences. This course does not count for graduation in any mathematics program. Credit given only for one of MATH 425, MATH 476 or MATH 525. (3-0-3)

**Enrollment:** Elective for non-math majors.

**Textbook(s):** Gravetter & Wallnau, *Statistics for the Behavioral Sciences*, ($6^{th}$ ed.), Belmont: Thompson-Wadsworth.
Kirkpatrick & Feeney, *A Simple Guide to SPSS for Windows,* (for version 12), Belmont: Thompson-Wadsworth.

**Other required material:** SPSS Student Version 12.0 for Windows

**Prerequisites:** none

**Objectives:**

1. Students will be proficient in basic SPSS skills.
2. Students will understand and be able to compute standard central tendencies and variabilities of samples and populations.
3. Students will understand and be able to compute for simple examples probabilities of events.
4. Students will be able to use SPSS to perform hypothesis tests and compute confidence intervals using z, t, and $\chi^2$ distributions and also using ANOVA.
5. Students will be able to use SPSS to compute correlation and regression coefficients.

**Lecture schedule:** One 150-minute lecture per week

| **Course Outline:** | Hours |
|---|---|
| 1. Introduction, misconceptions, descriptive statistics, frequency distribution | 4 |
| 2. Central tendency, variability | 3 |
| 3. Standard distribution, z-scores | 3 |
| 4. Probability | 5 |
| 5. Hypothesis testing, t-statistics | 7 |
| 6. Estimation, confidence intervals | 2 |
| 7. ANOVA | 4 |
| 8. Correlation & Regression | 3 |
| 9. Chi Square | 3 |
| 10. Nonparametric statistics | 6 |

| **Assessment**: | | |
|---|---|---|
| | Homework/Projects | 30-40% |
| | Midterm Exam | 30-40% |
| | Final Exam | 30-40% |

**Syllabus prepared by**: Fred Hickernell and Art Lubin
**Date**: Nov.2, 2006, modified Jan.22, 2008