Course Title: Industrial Design of Experiments

Number of Credits: 3 S.H.

Catalog Description: An introduction to applications of statistical methods used by industrial researchers to aid in the solution of certain types of industrial problems. Methods to include analysis of means, analysis of variance, factorial designs, and fractional factorial (screening) designs. There will be industrial case studies and actual (hands on) experience at local industries (when available).

Prerequisite: An introductory statistics course (preferably STAT 210 or STAT 303). Offered Spring Semester.

Possible Textbooks:

Topics Covered:

A. Introduction to Design of Experiments
B. Review of Simple Comparative Experiments
C. Single Factor Experiments
   1. ANOVA
   2. Model Checking
   3. Multiple Comparison Procedures and Contrasts
   4. Regression Approach
   5. Kruskal-Wallis and Rank Transformations
   6. ANCOVA
D. Randomized Blocks and Related Designs
E. Introduction to Factorial Designs
F. $2^k$ Factorial Designs
G. Blocking and Confounding in the $2^k$ Design
H. Fractional Factorial Designs
I. Factorial Designs with Random Effects
J. Nested Designs

Other topics may include (time permitting):
$3^k$ Designs, Taguchi Designs, Response Surface Methods, Process Optimization Methods
**Method of Instruction:** Methods may include lecture, case studies, group work, discussion and problem solving sessions, and computer sessions.

**Evaluation:** Exams, quizzes, computer assignments, and/or a final examination. A term project where students design and conduct their own experiment may also be assigned.

**Computer Software:**
- Design - Expert 6.0, Stat-Ease Inc. *
- SAS/JMP Professional Version
- MINITAB 14.0
- SPSS
  * Recommended