

## STATISTICS 425 "EXPERIMENTAL DESIGN"

**Calendar Description:** H(3-1T)

The objective and structure of an experiment, cause and effect, randomization, the estimation of error, replication, interaction, confounding. Using a computer as an aid in the analysis.

**Prerequisite:** Any one of Statistics 217, 327, 333, 357, Applied Psychology 301, Engineering 319, Mathematics 323, Psychology 312, Sociology 311, 312 or consent of the Division.

### *Syllabus*

<u>Topics</u>	<u>Number of hours</u>
Overview of types of experimental designs and selection criteria.	2
Partitions of total sum of squares and expectations.	2
Transformations.	2
Computing packages: MINITAB, SPSS, SAS, SPLUS/R.	3
Multiple comparison tests: Orthogonal tests; Fisher's LSD test, Tukey's HSD test, Scheffe's test, Newman-Keuls test, Duncan's test, Dunnett's test	5
Completely randomized Design: Assumptions and computations; A priori tests and a posteriori tests; Test for trends	4
Randomized Block Design: Fixed effects, random effects and mixed models and their analysis; Test for symmetry of covariance matrix	4
Latin Square Design: Randomization and layout, estimation of missing observations and relative efficiency	4
Nested and Nested Factorial Designs: Layout and computational procedures, Tests of differences in means and for trends. Problem of unequal cell frequencies. Tests for interactions	4
Split-Plot Design with confounding: Description and features; layout and computational procedures. Assumptions and tests of equality and symmetry of covariance matrices. Tests for differences and for trends, relative efficiency.	4
<b>TOTAL HOURS</b>	<b>34</b>

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