

# Syllabus for the Comprehensive Examination

Covering Material from STAT 530 (Experimental Design & Analysis)

## Topics:

- Analysis of variance (ANOVA), Least-squares estimation of model parameters, Model diagnostic;
- Contrasts, Orthogonal contrasts, Multiple comparisons; Tukey's method, Fisher's LSD, Scheffe's test, Bonferroni's t-test, Multiple range test, Duncan's test
- Randomized complete and incomplete block designs, Latin square design, Graeco-Latin square design;
- Two-factor factorial design,  $2^k$  factorial design, blocking a factorial design, confounding in  $2^k$  factorial design in  $2^p$  blocks, one-half fraction of the  $2^k$  design
- Two-factor factorial with random effects, two-factor mixed model;
- Two-stage nested design
- Repeated Measures and Split-Plot Designs

## References

1. Montgomery, D.C. *Design and Analysis of Experiments*, 6<sup>th</sup> edition, John Wiley & Sons, 2004.
2. Kuehl, R.O. *Design of Experiments - Statistical Principles of Research Design and Analysis*, 2nd Edition, Duxbury, 2000.