STAT598/FNR 598
Modern Applied Statistics
TTh 10:30-11:45 Recitation 309
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Prerequisite: STAT 503 or STAT 512 or equivalents.

Primary Audience: Graduate students in Agriculture and Science

Description: This course covers a wide range of topics that are most useful in agricultural, ecological, environmental, and natural resources sciences. Some topics are: analysis of categorical data, linear mixed effects models, spatial experiments and spatial data analysis, resampling methods (bootstrap), Markov chain Monte Carlo, Bayesian analysis, and spline-smoothing.

This course exploits the power of the computing language R, and BUGS for the Bayesian analysis of complex statistical models using Markov chain Monte Carlo (MCMC) methods, both of which are free downloadable at www.r-project.org and http://www.mrc-bsu.cam.ac.uk/bugs/welcome.shtml. *Emphases are given to not only the understanding of the models and methods but also the use of computer to solve complex real problems.*

Objectives: This course is designed for graduate students of both statistics and non-statistics majors. Students will learn a number of useful and advanced statistical methods in a single class and will be able to correctly apply them in real world problems, and to correctly interpret statistical results. It benefits both statistical students who have an interest in applications and non-statistics majors who need to apply statistical methods in their research. This course approaches statistics in a novel and creative way and covers many topics that students generally do not learn in one course.

Grading: Final grades are based on homework, project and/or exam. Students are allowed and encouraged to study as a group. However, each one has to turn in an independent work in his/her own words. For example, although it is allowed to study together for programming, a student needs to turn in his/her own program codes to show that he/she is able to carry out the programming.

For more information, visit [http://www.stat.purdue.edu/~zhanghao/MAS.html](http://www.stat.purdue.edu/~zhanghao/MAS.html) or contact the instructor.