

Stat 653 Statistics in Research III.

The analysis of messy and complex data sets using analysis of variance, analysis of covariance and regression analysis. Design of Experiments using JMP. Fixed, Random and Mixed Models using SAS MIXED ,HPMIXED, GLIMMIX and GLMSELECT procedures.

**Prerequisite: STAT 642 or Stat 652.**

**Textbook: None**

**Software: JMP and SAS 9.2 with Enterprise Guide**

**Topics:**

**Designs: JMP (4 weeks)**

Factorial Designs

Block Designs

Split Plot Designs

Response Surface Designs

Space Filling Designs

Screening Designs

Custom Designs

**Analyses: SAS (10 weeks)**

Regression – variable subset selection with LASSO

Mixed Models

Regression with non-constant variance

AR(1) Time Series

Split Plot Designs

Analysis of Covariance – random factors and subset selection

HPMIXED – high performance mixed models

GLIMMIX Models

Longitudinal Logistic Regression

## Poisson Regression with Random Effects

### **Project:**

The student will be required to 1) design an experiment and 2) analyze a dataset. This will be presented to the class via Camtasia.

### **Grading:**

Homework	10%
Project	20%
Exam 1	30%
Final	40%

1 point added to final grade if you complete the online "Student Evaluation of Faculty"

### Letter Grades:

- A 90 - 100
- B 80 – 89.99
- C 70 – 79.99
- D 60 – 69.99
- F below 60

### Grading of the project:

1. Correctness of the mathematical model
2. Correctness of the null hypotheses
3. Correctness of the analysis
4. Quality of presentation

### **Important Notice.**

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