

Review for Exam II - STAT 642

Exam II is on Wednesday, April 8, 2015 and will cover Handouts 5-8 and Chapters 1-6 in textbook. You will have 70 minutes to complete the examination. On Campus students will take the exam starting at 8:55 a.m. and Online students will take the exam starting at 10:30 a.m. (CDT).

Bring to the Exam:

- Calculator - Your device cannot facilitate a connection to the web or emailing or texting
- **A 5-page Summary of your notes (8.5in × 11in; both sides of the five pages)**
- Tables - **Tables for Exam II** - will be provided and are now in the Review for Exams folder on eCampus

Topics Covered on the Exam

1. Experimental Design:
 - (a) Completely Random Design (CRD)
 - (b) CRD with subsampling
 - (c) Treatment Structure:
 - i. Fixed Levels of Treatment
 - ii. Random Levels of Treatment
 - iii. Crossed Factors
 - iv. Partially Crossed Factors
 - v. Nested Factors
 - vi. Crossed Factors with a Control
2. Model:
 - (a) Cell Means
 - (b) Effects models with constraints
 - (c) Write Cell Means and Effects models in Matrix form
 - (d) Effects - Simple, Main, Interaction
3. Power of F-Test - Fixed and Random Treatment Levels
4. Determination of Number of Reps in Fixed Effects Experiments
5. Determination of Number of Reps or Number of Treatments in Random Effects Experiments
6. Confidence Intervals
 - (a) Treatment Means - Least Squares Estimators and Confidence Intervals
 - (b) Difference in Treatment Means
7. Post AOV Comparisons: Tukey, Hsu, Dunnett, Contrasts (Scheffé, Bonferroni)
8. Assessment of Model Assumptions
 - (a) Normality - Residual Plots and Shapiro-Wilks Test
 - (b) Equal Variances - Residual Plots and Brown-Forsythe-Levene's Test
 - (c) Independence - Residual Plots and Runs Test

- (d) Outliers - Studentized Residual Plots
9. Alternative Approaches when Model Assumptions are Violated
- (a) Violate Normality - Kruskal-Wallis Ranks Test or Transformations
 - (b) Violate Equal Variances - Transformations
 - (c) Violate Independence - Model Correlation
 - (d) Problems with using transformations
10. Random Effects
- (a) Models
 - (b) Variance Components
 - (c) Tests: REML or Satterthwaite Approximations
 - (d) Subsampling
11. In a factorial experiment involving missing treatments, specify which hypotheses can be tested and the appropriate test statistic.