

Psyc611 Intermediate Statistics

Psyc611 is an intermediate-level course in graduate statistics designed primarily to meet the needs of beginning graduate students in the social sciences. Advanced undergraduates with an appropriate background in statistics (i.e., normally a grade in the A range from Psyc212 or equivalent background) also may find Psyc611 suited to their needs. **Instructor approval for enrollment is required.**

Coverage includes both advanced analysis of variance procedures (e.g., nested factors; trend analysis) and multiple regression procedures (e.g., tests for mediation; hierarchical multiple regression). Use of SPSS is required, but prior experience with computerized data analysis is not expected.

Course Topics

I. Experimental Designs

<i>January 9</i> Howell: Ch 11, 13 Howell 214-215 Skim Chambliss&Dunlap	A. Analysis of Variance (ANOVA) 1. Independent and Dependent Variables 2. Review of basic ANOVA designs 3. Assumptions of between groups ANOVA and dealing with violations (e.g., computing degree of skew; test for homogeneity)
<i>January 9 - 14</i>	4. Introduction to SPSS: descriptives, transformation, ANOVAs
<i>January 14-16</i> Howell Ch 14	5. Repeated Measures ANOVA: assumptions and use with SPSS (e.g., Epsilon, Geisser-Greenhouse and Huynh-Feldt corrections)
<i>January 16 - 23</i> Howell: 204-211; Howell: Ch. 8, 350-360	6. Power in experimental designs and effect sizes (e.g., computing Beta, computing power for ANOVA, d , η^2 , ω^2)

<i>March 18</i> Howell Ch. 10	B. Other kinds of correlation (e.g., Spearman rho, Phi, Tetrachoric, Partial and Semi-partial Correlation) Relation to ANCOVA
<i>March 20-25</i> Howell Ch. 15	C. Multiple Correlation and Regression 1. The squared multiple correlation coefficient, R^2 2. Factors affecting R^2 (e.g., multicollinearity-VIF, outliers-Mahalanobis Distance; suppressor variables; shrinkage)
<i>March 27-April 1</i>	3. Standard Multiple Regression 4. Hierarchical Regression (e.g., complete vs reduce models; ΔR^2)
<i>April 3</i> Aiken&West Ch 2-4 <i>April 8</i> <i>April 10</i> Web Handout	5. Moderated Multiple Regression 6. Tests of Mediation 7. Repeated Measures Multiple Regression
<i>April 22 - April 24</i> May 2 8am - 12pm	Endterm Exam Final Exam

Evaluation

Two noncumulative examinations (one focusing on primarily on ANOVA techniques, the other focusing primarily on regression techniques) each will contribute 35% to the final grade. Each exam will comprise two parts: a standard written exam to assess conceptual information (2/3 of the exam grade) and a practical exam using SPSS to analyze data (1/3 of the exam grade).

A cumulative final examination will contribute 20% to the final grade. The format is yet undetermined, but it likely will assess a.) understanding of which analyses should be applied to particular problems and b.) ability to diagnose and anticipate problems with proposed analysis strategies. This exam will be held during the regularly scheduled final examination period (May 2 8-12).

Assignments will parallel the course coverage, and require analysis in SPSS and, where appropriate, by hand. Access to computers with SPSS will be provided for two hours each week when a.) the computer room is available and b.) the graduate assistant can be on-hand to provide assistance. Completion of the assignments is required and will contribute 10% to the final grade. Understand that these assignments are not intended as collaborative exercises: your work should be your own. Examples in class primarily will rely upon data sets to which you will have access, so efforts to replicate these examples would provide additional practice. Data and questions may be found on the course website.

Required Reading

- *Aiken, L., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. (Chapters 2 & 4). Newbury Park, CA: Sage
 - *Bogartz, R. S. (1994). *An introduction to the analysis of variance*. (Chapters 6 & 7) Westport, CN: Praeger
 - Howell, D. C. (2002). *Statistical methods for psychology*. 5th edition. Pacific Grove CA: Wadsworth.
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