To: CEHD Students and Advisors
From: M. Harwell, A. Zieffler, B. delMas
Re: Enrolling in Introductory Statistics Courses in Educational Psychology Beginning Fall 2015
Date: April 1, 2015

Effective fall 2015, Educational Psychology (EPsy) 8251/8261 will be combined into a single first semester course in introductory statistics, and EPsy 8252/8262 into a single second semester course in introductory statistics. This email is intended to provide guidance to students (and their advisors) planning to enroll in a first or second semester 8000 level course in introductory statistics in EPsy beginning fall 2015:

1. Students enrolling in EPsy 8251/8261 should be sufficiently familiar with the topics outlined below to draw on that familiarity to support their learning in EPsy 8251/8261. For example, in encountering one-way analysis of variance of means in 8251/8261 students should be able draw on their conceptual understanding of the two sample t-test of means and how to properly apply and interpret this procedure in ways that use the latter to promote a deep understanding of the former.

Specifically, students planning to enroll in EPsy 8251/8261 should have a sound understanding of:

- Data collection and scope of inference
  - Random sampling
  - Random assignment
- Exploratory data analysis
  - Plots (Box-and-whiskers plot, histograms etc.)
  - Descriptive Statistics
- Basics of inferential analyses
  - Normal distributions
  - Estimators, parameters
  - Sampling distributions
  - Central Limit Theorem
- One-sample inference (mean, correlation/slope)
  - Hypothesis testing
  - Confidence intervals
- Two-sample inference (means)
  - Hypothesis testing
  - Confidence intervals
- Association/Relationships
  - Correlation
Our experience is that students lacking this prerequisite knowledge often struggle in EPsy 8251/8261, and these students are strongly encouraged to first take EPsy 5261 (Introductory Statistical Methods) which explicitly covers these and other topics helpful in preparing for EPsy 8251/8261. Students planning to enroll in EPsy 8251/8261 are also strongly advised to be familiar with the R software prior to enrolling. R is used in EPsy 5261.

A syllabus outlining the topics covered in EPsy 8251/8261 can be obtained by contacting Dr. Michael Harwell (harwe001@umn.edu, ph: 612-625-0196), Dr. Andy Zieffler (zief0002@umn.edu, ph: 612-624-6083), or Dr. Bob delMas (delma001@umn.edu, ph: 612-625-2076). The 8251/8261 syllabus is also available at the Educational Psychology office in Room 250 Educational Sciences Building M - F 8:30-4:00.

2. Students planning to enroll in EPsy 8252/8262 without having completed EPsy 8251/8261 should have completed a course comparable to EPsy 8251/8261. The syllabus for EPsy 8252/8262 can be obtained by contacting Dr. Michael Harwell (harwe001@umn.edu, ph: 612-625-0196), Dr. Andy Zieffler (zief0002@umn.edu, ph: 612-624-6083), or Dr. Bob delMas (delma001@umn.edu, ph: 612-625-2076). The 8252/8262 syllabus is also available at the Educational Psychology office in Room 250 Educational Sciences Building M - F 8:30-4:00.

3. The expectation continues to be that students planning to enroll in an upper-level statistics/measurement course such as:

- EPsy 8266 (Statistical Analysis Using Structural Equation Methods)
- EPsy 8267 (Applied Multivariate Analysis)
- EPsy 8268 (Hierarchical Linear Modeling in Educational Research)
- EPsy 8282 (Statistical Analysis of Longitudinal Data)
- EPsy 8290 (Item Response Theory)

will have completed a two-semester graduate-level introductory statistics sequence. Students who completed EPsy 8252 prior to fall 2015 should be prepared for upper-level statistics/measurement courses. Students planning on taking upper-level courses in statistics/measurement who have already completed EPsy 8262 but not EPsy 8252 need to be aware that several topics covered in EPsy 8252 were not covered in EPsy 8262 prior to fall 2015. Students who have not already completed EPsy 8252 and do not plan on enrolling in the newly combined EPsy 8252/8262 course should examine the following topics before enrolling in upper-level courses in statistics/measurement in Educational Psychology:

- Weighted least squares estimation, maximum likelihood estimation (likelihood function, log-likelihood function, deviance function)
- Information criteria (AIC, BIC, etc.) and use of information criteria for model selection
- Using matrix algebra to express models, compute estimates, etc.
- Regression diagnostics (leverage and influential observations)
Multi-level models for clustering (HLM) for cross-sectional and longitudinal data

Some resources that you might want to consult to help you in this endeavor include:


If you have questions about the transition to a single introductory statistics sequences (EPsy 8251/8261, EPsy 8252/8262) or preparing for upper-level EPsy courses in statistics/measurement please contact Dr. Michael Harwell ([harwe001@umn.edu](mailto:harwe001@umn.edu), ph: 612-625-0196), Dr. Andy Zieffler ([zief0002@umn.edu](mailto:zief0002@umn.edu), ph: 612-624-6083), or Dr. Bob delMas ([delma001@umn.edu](mailto:delma001@umn.edu), ph: 612-625-2076).