

GEORGE MASON UNIVERSITY
COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT
GRADUATE SCHOOL OF EDUCATION
Ph.D. in Education

EDRS 797-001: Advanced Topics in Education (3 credits)
Applications of GLM Based Methods to Large Scale Datasets for Education Research
Fall 2015

Instructor:	Jehanzeb Cheema, Ph.D.
Time & location:	Friday, 4:30 pm – 7:10 pm; L013 Thompson Hall
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Office hours:	By appointment

Note: Please note that this syllabus is tentative and some areas are subject to change as we proceed through the semester.

Course description

Catalog entry: Advanced study of selected topics in education for students preparing for doctoral studies or who have been admitted to the PhD program in education.

Expanded description: This 3-credit course will focus on applications of the general linear model to large scale datasets. We will especially spend time becoming familiar with the Program for International Student Assessment (PISA). Topics covered include sampling weights, plausible value analysis, missing data imputation, and data simulation.

Course objectives

At the completion of this course the students would have learned to:

1. download large scale education-related datasets from public sources (such as NCES), and import them into a standard statistics software package.
2. clean up and manipulate data files in order to prepare them for analysis.
3. apply GLM-based methods to answer research questions of interest.
4. handle issues specific to large scale datasets such as sampling weights, plausible value analysis etc.

Statistical software

IBM SPSS Statistics is required for this course.

Textbook

No textbook is required. The instructor will distribute informational handouts and specify readings as necessary during the course of the semester.

Grading

The overall grade is based on the following components:

Literature review of selected topic and identification of a research question	20%
Selection of an appropriate GLM-based method and completion of the method section	20%
Data analysis and reporting of results in APA format	40%
Discussion of analytical results	10%
End-of-semester paper presentation	10%
Total	100%

Final grades will be based on the following percentage scale:

A+ = 98 – 100%	A = 93 – 97.99%	A- = 90 – 92.99%
B+ = 88 – 89.99%	B = 83 – 87.99%	B- = 80 – 82.99%
C = 70 – 79.99%	F < 70%	

Tentative list of topics

Note: We may cover topics in a different order than listed here. The last few topics are optional and we will cover them only if time allows. The enrollment for this course is expected to be small which will provide us with the opportunity to add or delete topics, and discuss individual projects during the course of the semester.

Paper requirement

After the first week of class, students will be provided with a list of topics to choose from. These topics will involve application of the general linear model. Students will conduct a brief literature review (5-6 pages) on their selected topic, choose an appropriate method in consultation with the instructor, and then proceed with data analysis and reporting of results. By the end of the semester each student is expected to have completed one full publication-quality paper. A draft of the paper is due at the beginning of last Friday of each month.

Timeline

Week	Date	Topic	Submission due
1	Sep. 4	Introduction to the general linear model	
2	Sep. 11	Introduction to the general linear model/Basics of SPSS	
3	Sep. 18	Data sources	
4	Sep. 25	Questionnaires, codebooks, and technical manuals	Research paper draft 1
5	Oct. 2	Working with sampling weights	
6	Oct. 9	Merging and disaggregating datasets	
7	Oct. 16	Handling missing data	
8	Oct. 23	Handling missing data	
9	Oct. 30	Plausible value analysis	Research paper draft 2
10	Nov. 6	Bootstrap estimation	
11	Nov. 13	Data simulation	
12	Nov. 20	Hierarchical models	Research paper draft 3
13	Dec. 4	SEM	
14	Dec. 11	Paper presentations	Final research paper

Rubric for data analysis and reporting assignment (40% of overall grade)

Criteria	Outstanding (4)	Proficient (3)	Basic (2)	Below expectations (1)
1. Interpretation of statistical results	Sound interpretation with no errors.	Good interpretation with minor errors.	Fair interpretation with 1-2 major errors.	Major errors abound in interpretation of results.
2. Reporting of statistical results	No errors in reporting of statistical results.	Accurate reporting with minor errors.	Reporting is accurate with one or two major errors.	Major errors abound in reporting of results.
3. Adherence to APA guidelines in construction of tables, figures, appendices, and equations	No violation of APA guidelines.	Minor violation of APA guidelines.	No more than 1-2 major violations of APA guidelines.	Major violations of APA guidelines occur throughout the text.
4. Spelling and expression	No mistakes. Clear and concise expression.	Occasional spelling/grammatical mistakes or instances of ambiguous/unclear expression.	A few spelling/grammatical mistakes, and very few instances of ambiguous/unclear expression.	Spelling and grammatical mistakes abound. Ambiguous or unclear expression occurs throughout the text.

GMU policies and resources for students

- a. Students must adhere to the guidelines of the George Mason University Honor Code [See <http://oai.gmu.edu/the-mason-honor-code/>].
- b. Students must follow the university policy for Responsible Use of Computing [See <http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>].
- c. Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account.
- d. The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance [See <http://caps.gmu.edu/>].
- e. Students with disabilities who seek accommodations in a course must be registered with the George Mason University Office of Disability Services (ODS) and inform their instructor, in writing, at the beginning of the semester [See <http://ods.gmu.edu/>].
- f. Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.
- g. The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing [See <http://writingcenter.gmu.edu/>].

Professional dispositions

Students are expected to exhibit professional behaviors and dispositions at all times.

Core values commitment

The College of Education & Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles [<http://cehd.gmu.edu/values/>].