University of Texas at Austin

Department of Educational Psychology

EDP 380C 23-Missing Data Analysis

EDP 380C 23-Missing Data Analysis Spring 2018	
Instructor: Keenan Pituch, Ph.D.	*Meeting Times*: W: 9:00 – 12:00
Office: SZB 538C	*Meeting Rooms*: SZB 432
Phone: (512) 471-0672	*Office Hours*: T, TH: 1:00 – 2:30; other times by appointment
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I.   Course Description

This course covers the problem of incomplete data that is common to social science research. Topics include patterns and mechanisms of missing data, conventional and modern missing data treatments, maximum likelihood and multiple imputation missing data treatments, incorporating auxiliary variables into the analysis, models for data not missing at random, and reporting results from a missing data analysis. Missing data treatments are applied to various statistical models. Statistical software applications are included. Additional prerequisite: EDP 380C 12-Survey of Multivariate Methods or consent of instructor.

II.   Course Goals

The goals of this course are to provide students with an understanding of the principles underlying missing data analysis. Specifically, students will assess the reasonableness of missing data mechanisms, select appropriate missing data treatments, develop a working knowledge of how to conduct missing data analysis, and be able to properly interpret and communicate analysis results. Emphasis will be placed on helping students develop a conceptual understanding of missing data analysis, acquire generally accepted missing data analysis practices, and interpret analysis results.

III.   Textbook

The textbook adopted for this course is:

Enders. Craig, K. (2010). *Applied missing data analysis.* New York: Guilford.

IV.   Statistical Software

We will be using Mplus and SAS to analyze data for this class. Mplus and SAS are freely available at the UT's Stat Apps Server. You can find directions for connecting to the Stat Apps Server at:

https://stat.utexas.edu/consulting/stat-apps-server#statapp

V.   Topics

The major missing data analysis principles and techniques covered in this course are:

1.   Understanding and assessing missing data mechanisms
2.   Traditional methods of missing data analysis
3.   Conducting missing data analysis with maximum likelihood estimation
4.   Maximum likelihood estimation with auxiliary variables, nonnormality, and categorical data
5.   Bayesian estimation
6.   Multiple imputation
7.   Selection and pattern mixture models for data missing not at random

VI.   Requirements

1. Test 1
2. Test 2
3. Test 3
4. Test 4

The tests will cover instructional objectives as provided in class. The format of the test questions will be short answer and essay. **There is no extra credit**.

VII.   Grading Scale

The grade you receive for this course will be based on the percent of points you obtain on the tests. All exams are weighted equally, each comprising one quarter of your total course score. Your course average score is computed as the average of the test scores (percent correct), with the course grade based on the ranges below.

A	93-100%
A-	90-92%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	73-76%
C-	70-72%
D	66-69%
F	< 66%

VIII. Course Schedule and Policies

A.   Tentative Course Schedule

Date	Unit	Readings
January 17	Missing data mechanisms and traditional methods	Ch. 1-2
January 24	Missing data mechanisms and traditional methods	Ch. 1-2
January 31	Maximum likelihood estimation (MLE) and MLE with missing data	Ch. 3-4
February 7	MLE with missing data	
February 14	**Test 1**	
February 21	MLE extensions (auxiliary variables)	Ch. 5
February 28	MLE extensions (nonnormal and categorical data)	Ch. 5
March 7	**Test 2**	
March 14	*Spring Break*	
March 21	Bayes estimation and Multiple Imputation (MI)	Ch. 6-7
March 28	MI	Ch. 7-8 (Ch. 9)
April 4	MI with normally distributed and categorical variables	Enders 2015 Slides
April 11	**Test 3**	
April 18	Selection and Pattern Mixture Models	Ch. 10
April 25	Selection and Pattern Mixture Models	Ch. 10
May 2	**Test 4**	

B.   Policies

The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471-6259, 471-4641 TTY. If they certify your needs, I will work with you to make appropriate arrangements.

A student who misses an examination, work assignment, or other project due to the observance of a religious holy day will be given an opportunity to complete the work missed within a reasonable time after the absence, provided that he or she has properly notified the instructor. It is the policy of the University of Texas at Austin that the student must notify the instructor at least fourteen days prior to the classes scheduled on dates he or she will be absent to observe a religious holy day. For religious holy days that fall with the first two weeks of the semester, the notice should be given on the first day of the semester. The student will not be penalized for these excused absences, but the instructor may appropriately respond if the student fails to complete satisfactorily the missed assignment or examination within a reasonable time after the excused absence.