

EDMS 657: Exploratory Latent and Composite Variable Methods

FALL SEMESTER 2018 — Tue 4:15-7:00; 0220 Benjamin

Professor
Dr. Gregory R. Hancock
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e-mail: gh Hancock@umd.edu

Office hours
Tuesdays 3:30-4:00, 7:00-7:30; other times by appt.
Hours are first come, first serve

Course material (not in bookstore; to be acquired on your own)
required:
• many other materials posted on ELMS throughout the semester

Weekly lecture materials
https://elms.umd.edu (use your Testudo login to access the ELMS site)
Prior to coming to class each week students are to download or print out lecture materials for that week. Materials should appear on the course website no later than midday of the day of class.

General Course Information
This is intended to be a course addressing a variety of composite and latent variable methods, primary among the latter being exploratory factor analysis. The course requires prior experience with inferential statistics up through multiple regression (e.g., EDMS 646), as well as a familiarity with SPSS (or other comparable software). If you wish to use SPSS but don’t have access, there are versions for PC (https://terpware.umd.edu/Windows/Title/1880) and Mac (https://terpware.umd.edu/Mac/Title/1880). You may purchase a license from the Terrapin Technology Store (http://www.it.umd.edu/techstore/) in Stamp Union, and get it installed on your computer. In addition, the computer lab in the College of Behavioral and Social Sciences (LeFrak Hall ground floor) has SPSS on its computers (http://www.oacs.umd.edu/ComputerLabServices.asp), as may other labs around campus as well (basement of Benjamin sometimes has it as well. If you wish to use other software (e.g., R, Stata), you are welcome to do so, but are responsible for getting your own support if you have problems.

In general, the course will proceed through the following topics; some will take much longer than others.
• course overview; multivariate general linear model
• multivariate analysis of variance (MANOVA), including multivariate tests in repeated measure designs
• canonical correlation
• principal component analysis
• exploratory factor analysis
• multidimensional scaling
• cluster analysis
• introduction to mixture models
• introduction to latent class analysis (if time)

Formal Course Assessment

Homework:
There will be several assignments involving SPSS (or comparable software), and possibly Mplus, each designed to give students a chance to practice the concepts learned in class. Although typed work is preferred, neatly handwritten work is acceptable. In your homework you should insert relevant portions of your computer output into the appropriate places in your homework to show where you got your answers. Students should not write, "See p.136 of the attached computer printout to see where I got my answer." Assignments should be very neat, and free from spelling, grammar, and punctuation errors. Also, you should try to keep a copy (photo or electronic) of your work for your own protection. You are welcome (although not required) to work in pairs on homework; submitted work must have both participating students’ names on it.

Assignments are due as specified in class, and should be submitted on time for full earned credit. Late work will be accepted for full earned credit if and only if arrangements are made with the instructor prior to time due. Otherwise, 10% of the points possible will be deducted for each weekday the assignment is late.

Project:
Based on your own data, that of a faculty member in your area, or that from an available database (e.g., on the web), students will develop a project with a brief write-up, to be presented in a class poster session (tentatively, Dec 4). Details of this poster will be given as the semester progresses. Meanwhile, students should start hunting for some data. Once students have an idea, however vague, they should come see me as soon as possible. Don't wait until the last minute! Also, students are encouraged to work in pairs on this project; it is not mandatory, but encouraged.
Quizzes:
At the start of every other class meeting a short quiz will be administered (tentatively: Sept 11, Sept 25, Oct 30, Nov 13, Nov 27). Each quiz will cover material from the lessons since the last quiz, unless otherwise specified, and should not take more than 10 or 15 minutes. Students who miss the quiz will not be able to make it up unless prior arrangements have been made with the instructor. You may use one 8.5”×11”, two-sided page of notes (experience has taught me, however, that students tend to be much better prepared if they don't need to rely on it too heavily). Students should bring a calculator to the quizzes.

Exams:
There will be an in-class midterm exam in mid-to-late October (tentatively: Oct 9) and an in-class final exam at the end of the semester (tentatively Dec 18). For each exam, students may use three 8.5”×11” two-sided pages of notes; tables and scratch paper will be provided by the instructor at the time of the exam as needed. Students should bring a calculator to the exams. Exams are to be done completely independently; any student found doing otherwise will be subject to the maximum university penalties (see Academic Integrity, below).

Course grades
This course is not graded on a curve. Homework, project, quizzes, and exams will be combined according to the percentages shown on the left. A worksheet for computing grades is provided. Final grades will be assigned using the scale to the right (without rounding):

<table>
<thead>
<tr>
<th>assessment</th>
<th>weight</th>
<th>overall course percent</th>
<th>grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total quiz points converted to a percentage</td>
<td>10%</td>
<td>98.0000 % — 100 %</td>
<td>A+ (4.00)</td>
</tr>
<tr>
<td>Total homework points converted to a percentage</td>
<td>20%</td>
<td>92.0000 % — 97.9999 %</td>
<td>A    (4.00)</td>
</tr>
<tr>
<td>Total project points converted to a percentage</td>
<td>15%</td>
<td>90.0000 % — 91.9999 %</td>
<td>A-   (3.70)</td>
</tr>
<tr>
<td>Total midterm exam points converted to a percentage</td>
<td>25%</td>
<td>88.0000 % — 89.9999 %</td>
<td>B+   (3.30)</td>
</tr>
<tr>
<td>Total final exam points converted to a percentage</td>
<td>30%</td>
<td>82.0000 % — 87.9999 %</td>
<td>B    (3.00)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>80.0000 % — 81.9999 %</td>
<td>B-   (2.70)</td>
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Unless a computational error has been made, grades will not be altered. All requests for academic accommodations should be made as early as possible in the semester. Further information concerning disability accommodations can be obtained from the Accessibility & Disability Service website: http://www.counseling.umd.edu/ads/.

Grades of "Incomplete":
Grades of "Incomplete" will not be given for EDMS657 except in cases of extreme emergency.

Policy on auditors
Student and faculty auditors are welcome in this class. They are not required to submit work.

Academic Accommodations
In compliance with and in the spirit of the Americans with Disabilities Act (ADA), I want to work with you if you have a documented disability that is relevant to your work in this course. If you need academic accommodation by virtue of a documented disability, please contact me as soon as possible to discuss your needs. Students with documented needs for an accommodation must meet the same achievement standards required of all other students, although the exact way in which achievement is demonstrated may be altered. All requests for academic accommodations should be made as early as possible in the semester. Further information concerning disability accommodations can be obtained from the Accessibility & Disability Service website: http://www.counseling.umd.edu/ads/.

Academic Integrity
The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit http://www.shc.umd.edu for details.

Make-Up Examinations
University policy states: "An instructor is not under obligation to offer a substitute assignment or to give a student a make-up assessment unless the failure to perform was due to an excused absence, that is, due to illness (of the student or a dependent), religious observance (where the nature of the observance prevents the student from being present during the class period), participation in university activities at the request of university authorities, or compelling circumstances beyond the student's control. Students
claiming excused absence must apply in writing and furnish documentary support for their assertion that absence resulted from one of these causes.

**No Class, or Guest Lecturers**

On select nights during the semester I may have to be out of town for professional commitments. In such a case either out-of-class materials (e.g., video) will be given in lieu of a formal meeting or a guest lecturer will cover the material in class (which students are expected to attend).

**Course evaluations**

Your participation in the evaluation of courses through CourseEvalUM is a responsibility you hold as a student member of our academic community. Your feedback is confidential and important to the improvement of teaching and learning at the University as well as to the tenure and promotion process. CourseEvalUM will be open for you to complete your evaluations for fall semester courses starting in late November, as will be indicated in class. You will be able to go directly to the website (www.courseevalum.umd.edu) to complete your evaluations. By completing all of your evaluations each semester, you will have the privilege of accessing online the evaluation reports for the thousands of courses for which 70% or more students submitted their evaluations.

**Readings**

A detailed calendar is not provided as I'm not exactly sure how long topics will take to cover. The order, scope, and resources for the course readings will be posted on our course ELMS site as we go.
<table>
<thead>
<tr>
<th>Quiz 1</th>
<th>Quiz 2</th>
<th>Quiz 3</th>
<th>Quiz 4</th>
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<th>Midterm</th>
<th>Final Exam</th>
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<tr>
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<td>% of midterm points possible</td>
<td>% of final exam points possible</td>
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<th>decimal × % score</th>
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TOTAL WEIGHTED COURSE PERCENTAGE: | | | |

Total weighted course % grade
98.0000 % — 100 % A+ (4.00)
92.0000 % — 97.9999 % A (4.00)
90.0000 % — 91.9999 % A- (3.70)
88.0000 % — 89.9999 % B+ (3.30)
82.0000 % — 87.9999 % B (3.00)
80.0000 % — 81.9999 % B- (2.70)
78.0000 % — 79.9999 % C+ (2.30)
72.0000 % — 77.9999 % C (2.00)
70.0000 % — 71.9999 % C- (1.70)
65.0000 % — 69.9999% D+ (0.00)
60.0000 % — 64.9999% D (0.00)
55.0000 % — 59.9999% D- (0.00)
≤54.9999% F (0.00)