COM 631: Multivariate Statistical Methods

Spring 2019
6:00-8:50 pm, Thursday, MU 208
Prof. Kim Neuendorf Office hrs.:
MU 253 Wed. 10:00am-12:00noon, Thur. 11:30am-1:00pm, and by appointment
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COURSE OBJECTIVE: Building on the foundation of COM 512 (or its equivalent), this course will cover more advanced quantitative analysis, with an emphasis on multivariate statistics. Inasmuch as the goal of the course is to develop your skills as designers, commissioners, and interpreters of research, an emphasis will be placed on the use and interpretation of complex statistics, rather than on the mechanics of their calculation. In the class, we will make frequent use of the data analytic computer package SPSS.

COURSE MATERIALS:

The following text is required:

Hair, J. F. Jr., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Upper Saddle River, NJ: Prentice Hall.

Other required readings:

*Many handouts prepared by your instructor will be posted on the class web site and/or distributed in class throughout the term.

*Other required articles or chapters will be posted on the class web site.

*It's recommended that students have available a manual or textbook on the use of SPSS. The following is one recommendation:

George, D., & Mallery, P. (2016). *IBM SPSS Statistics 23 Step by Step: A Simple Guide and Reference* (13th ed.). New York: Routledge.

The following texts are recommended for backup, and for additional information on selected topics:

Aldenderfer, M. S., & Blashfield, R. K. (1984). *Cluster analysis*. Beverly Hills, CA: Sage.

Babbie, E. (2016). *The practice of social research* (14th ed.). Boston, MA: Cengage Learning.

Blalock, H. M. (1979). *Social statistics* (2nd ed.). New York: McGraw-Hill.

Bray, J. H., & Maxwell, S. E. (1985). *Multivariate analysis of variance*. Beverly Hills, CA: Sage.

Carmines, E. G., & Zeller, R. A. (1979). *Reliability and validity assessment*. Newbury Park, CA: Sage.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.

Harris, R. J. (2001). *A primer of multivariate statistics* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

Hayduk, L. A. (1987). *Structural equation modeling with LISREL: Essentials and advances*. Baltimore: The Johns Hopkins University Press.

Hosmer, D. W. Jr., Lemeshow, S., & Sturdivant, R. X. (2013). *Applied logistic regression* (3rd ed.). Hoboken, NJ: Wiley.

Kachigan, S. K. (1991). *Multivariate statistical analysis: A conceptual introduction* (2nd ed.). New York: Radius Press.

Keppel, G., & Wickens, T. D. (2004). *Design and analysis: A researcher's handbook* (4th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Klecka, W. R. (1991). *Discriminant analysis*. Newbury Park, CA: Sage.

Kruskal, J. B., & Wish, M. (1991). *Multidimensional scaling*. Newbury Park, CA: Sage.

Maruyama, G. M. (1998). *Basics of structural equation modeling*. Thousand Oaks, CA: Sage.

Pedhazur, E. J. (1997). *Multiple regression in behavioral research: Explanation and prediction* (3rd ed.). Fort Worth, TX: Harcourt Brace College Publishers.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Boston, MA: Pearson.

Thompson, B. (1984). *Canonical correlation analysis: Uses and interpretation*. Beverly Hills, CA: Sage.

Voelker, D. H., Orton, P. Z., & Adams, S. V. (2011). *CliffNotes statistics quick review*. New York: Wiley.

Williams, F., & Monge, P. (2001). *Reasoning with statistics: How to read quantitative research* (5th ed.). Fort Worth, TX: Harcourt Brace Publishers.

COURSE REQUIREMENTS:

Further information on each of these assignments will be discussed in class as the term progresses:

1. A midterm and a final exam. Both will be completed via Blackboard. Both may include the requirement of some SPSS analyses. The final may include the critique of at least one published research article. The midterm will be due on Friday, March 8, and the final exam will be due on Friday, May 10.
2. Data handling assignments--each student will be required to perform several data-handling tasks. These include an assignment on scale construction, controlling for the impact of mediating variables, and the running of multivariate statistics that are not included in other assignments.
3. In-class presentation on one multivariate statistic--each student will be assigned a technique to learn in detail. The presentation will include sample SPSS commands and output exemplifying the statistic as derived from a class data set. It will also include the findings correctly tabled, with a short written description of the findings. All presentations will be reviewed with the instructor prior to presentation, and will be included in the class web site.

MIDTERM	40 pts.	20%
FINAL EXAM	40 pts.	20%
DATA HANDLING		
(various tasks)	70 pts.	35%
PRESENTATION	50 pts.	25%
	200 pts.	100%

TENTATIVE COURSE OUTLINE:

1.	A review of univariate and bivariate statistics	Hair et al., Chs. 1, 2
2.	SPSS & data handling and Scale construction	
3.	Factor analysis	Hair et al., Ch. 3
4.	Multiple regression	Hair et al. Chs. 4
5.	Discriminant analysis	Hair et al. Ch. 5
6.	Logistic regression	Hair et al. Ch. 6
7.	Multivariate analysis of variance (MANOVA) and covariance (MANCOVA)	Hair et al. Ch. 7
8.	Canonical correlation	TBA
9.	Cluster analysis	Hair et al. Ch. 9
10.	Multidimensional scaling and Correspondence analysis	Hair et al. Ch. 10, 11
11.	Structural equation modeling (SEM)	Hair et al. Chs. 12-15