

Advanced statistics

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Course credits: 3

Class time and venue: Wed., 13:15 – 16:00, **Computer lab**

Office hours: By appointment

Course Descriptions

This **EMI course** aims to develop an understanding of and practical skills in choosing appropriate strategies and procedures to collect, manage, analyze, interpret and report quantitative data in psychological research.

Upon completion of this course, students will be capable of using the methods independently for their research (e.g., master's thesis). In this course, students are given plenty opportunities to practice and exercise with different examples and tools. Knowledge about elementary statistics will be advantageous.

Learning Objectives

Upon successful completion of the course, students will be able to:

1. Describe major methods in collecting quantitative data
2. Apply appropriate procedures to analyze quantitative data
3. Interpret results from quantitative analyses properly
4. Communicate research findings in a scholarly way

Textbook

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2018). *Multivariate data analysis* (8th ed.). Upper Saddle River, NJ: Prentice Hall.

[Tabachnick, B. G., & Fidell, L. S. \(2022\). *Using multivariate statistics* \(7th ed.\). Boston: Pearson.](#)

Reminders

- 1) Academic honesty is central to the conduct of academic work. Students are expected to present their own work, give proper acknowledgement of other's work, including the correct use of quotation and page number for direct quotes of paragraphs, sentences and phrases, and honestly report for findings obtained. Students who commit an act of academic dishonesty which jeopardizes the integrity of the learning and assessment process may be liable to disciplinary actions.
- 2) Do not make or acquire illegal copies of the readings.

Tentative Weekly Schedule and Activities

Week	Date	Topics	Suggested readings
1	Sep 9	Pre-test	
2/3	Sep 16/23	Introduction to multivariate analysis and data screening	Hair et al., Ch1 & 2
4/5	Sep 23/30	From Simple regression to multiple regression	Hair et al., Ch5
6/7	Oct 7/14	Path analysis: mediation and moderation	Hair et al., Ch5
8/9	Oct 28; Nov 4	Factor analysis	Hair et al., Ch3 & 9
10	Nov 11	Structural equation modeling (SEM)	Hair et al., Ch11 & 12
11	Nov 18	Review and consultation	
12	Nov 25	Examination I (lab-based skills)	
	Dec 2	#Examniation II (written report)	
13/14	Dec 2/9	MANOVA	Hair et al., Ch6
15/16	Dec 16/23	Paper critique and presentation	
17/18		TBC	

Note: Weeks 17 and 18 are reserved for make-up classes.

Assessment

Paper critique and presentation (20%)

Students will work in groups of five to select, present, and critique a published article. Presentations should highlight methodological strengths and weaknesses, propose alternative approaches, and engage peers in discussion. (See Appendix I for detailed guidelines.)

Classroom participation and attending tutorial classes (10%)

Students are expected to read one to two assigned papers or chapters each week prior to class. Active participation in lectures and tutorials is required, including contributing to discussions and collaborative exercises.

Quizzes and homework (30%)

Several assignments (both in-class and take-home) and short quizzes will be administered during the semester. The 3 highest scores from homework and quizzes will be counted toward the final grade.

- Assignments must be submitted by the stated deadlines. Late submissions will not be accepted.
- No make-up quizzes will be provided.

Examination (40%)

The mid-term examination is a skill-based assessment requiring students to apply statistical methods and software learned in class to analyze datasets provided by the instructor.

- In-lab data analysis (20%): Conduct data analyses in the computer lab **from 1:15 pm to 4:00 pm on Nov. 25.**
- Take-home written report (20%): Prepare a written report based on **In-lab data analysis.**

Reports must be submitted in Word format to the course website by **1:15 pm on Dec 2.**

The exam is open-book but strictly individual. Collaboration or discussion with classmates is prohibited and will be considered academic misconduct.

Appendix 1: Paper critique and presentation (details)

Duration for each Discussion Seminar: Around 25 mins

Expected components in each Discussion Seminar: Presentation & Discussion sessions

Recommended time frame (recommended only, you may or may not want to follow, so long as you can complete the entire seminar in 25 mins): 15 mins for Presentation & 10 mins for Discussion (including Q & A)

Presentation session: More like a one-way delivery

Discussion session: More interaction with the audience would be expected. The exact format for the discussion session is up to you. The goal is to engage the audience to think more deeply into your topic and to initiate some discussion. You may, for instance, lead a Q&A session and have some guiding questions prepared in advance, allow time for group discussions and ask feedback from other, or even show a short clip which is related to your topic to elicit some further thoughts and discussion etc.

Expectations and marking scheme

1) Present the chosen papers in a clear and easy-to-understand manner (e.g., the key issues and arguments raised by the author(s), some details of the methodology, general findings, and conclusion) **(30% of mark)**

2) Evaluate the strengths and weaknesses of the chosen studies, including its 1) methodology (e.g., whether the method is sound or not, and its suitability for the target issue), 2) theoretical significance, and 3) applied values **(30% of mark)**

3) Discuss whether and how the different research approaches can complement each other to enrich our understanding about the target issue **(30% of mark)**

4) Lead a discussion session in an interactive manner **(10% of mark)**

Item 1) above must be completed in the Presentation session

Items 2) and 3) can be included in the Presentation and/or Discussion session