PSYC 302, Statistical Analyses in Psychology (3 credits)

Instructor: Zahra Hussain
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Office, extension: Jesup 103A, 4529
Meeting times: Monday 2:00-4:30 pm; some Wednesdays (see schedule; time TBD)
Location: Nicely 207
Office hours: Thursday 10:00 am-12:00 pm
Evaluation: Two midterms (30% each) and one comprehensive final exam (40%).
Texbook (required): Maxwell, S. E., Delaney, H. D. & Kelley, K. (2018). Designing Experiments and Analyzing Data: A model comparison perspective (3rd Ed.). New York: Routledge The companion website for this book is at: www.designingexperiments.com

Course description: PSYC 302 is the second component of the research methodology module of the master's degree in psychology. The goal of this course is to develop an understanding of inferential statistical tests used in behavioural research, with an emphasis on the use of linear models to analyze data that have been collected using balanced experimental designs. The goal also is to provide the skills to conduct statistical analyses independently using R software, including data visualization, test selection and interpretation. The course material is designed with the assumption that students have completed an undergraduate statistics course. A review of basic statistical concepts will be given in the first two lectures.

Most classes will consist of a lecture (1-1.5 hour) followed by a computer-based laboratory in which students will practice computing statistical tests in R (1-1.5 hrs). I may schedule extra lectures if needed.

Learning outcomes:
1. Choose appropriate statistical tests for a given experimental design
2. Visualize data and implement statistical tests in R software for statistical computing
3. Understand and evaluate the assumptions of these tests
4. Identify anomalies in data (missing data, outliers), and treat such cases appropriately
5. Apply the general linear model to experimental data, conduct model comparisons to evaluate the best fitting model

Software: All exercises will use the statistical computing environment, R. No familiarity with R is assumed. Versions of R for Windows, OS X, and Linux can be obtained at http://cran.r-project.org/. You may also use R Studio, which can be downloaded at: https://www.rstudio.com/products/rstudio/download/. Please install R and R Studio on your laptops if you will be using them for class exercises and homework.

Course policy: Please be on time to class, try to attend all classes, read the assigned readings and ask questions in class if you do not follow the material. Attendance will not be taken, but I will be keeping track of absences. If you are going to miss class or be late, please let me know in advance via email or in person. If you are absent for more than two lectures, I may recommend your withdrawal from the course. Cellphones may not be used in class. Laptops may only be used during R exercises.You are responsible for keeping track of assignments and course content posted on Moodle. Please check Moodle regularly for course updates. Homework assignments will not be graded, but answer keys will be provided a week after the assignment. You are encouraged to complete all homework assignments independently. **Grading** will be criterion-referenced (measured against fixed criteria), with adjustments made to the grade distribution depending on class performance. I maintain the right to modify course content, method of evaluations, or the grade distribution at any point in the semester.

Course schedule

1. Jan 29	**Introduction and review of statistical inference (I)** Chapter 1- The logic of experimental design and analysis MDK Tutorial 1: Review of basic statistics; see Moodle
2. Feb 5	**Review of statistical inference (II)** Chapter 1- The logic of experimental design and analysis MDK Tutorial 1: Review of basic statistics
3. Feb 12	**Looking at the data - assumptions, outliers and missing data** Tabachnik & Fidell, Chapter 4 (assigned pages) + other TBD; see Moodle
4. Feb 19	**Introduction to model comparisons: One-way between subjects designs (ANOVA)** MDK Chapter 3 *[homework 1]*
Feb 21 (Wednesday)	**Practice session (1.5 hour)**
Feb 24 (Saturday)	**MIDTERM 1 (30%)**
5. Feb 26	**Individual comparisons of means - linear contrasts** MDK Chapter 4
6. Mar 5	**Testing several contrasts: Multiple comparisons** *[homework 2]* MDK Chapter 5
7. Mar 12	**Two-way between subjects factorial designs (main effects and interactions)** MDK Chapter 7
8. Mar 19	**Factorial designs: unbalanced data, higher order designs** *[homework 3]* MDK Chapter 7, 8 (assigned sections)
Mar 21 (Wednesday)	**Practice session (1.5 hour)**
Mar 24 (Saturday)	**MIDTERM 2 (30%)**
9. Mar 26	**Correlation and regression** *[homework 4]* TBD
Apr 2	**Holiday - NO CLASS**
Apr 9	**Holiday - NO CLASS**
10. Apr 16	**Designs with covariates: ANCOVA** MDK Chapter 9
Apr 18 (Wednesday)	**Practice session (1 hour)**
11. Apr 23	**One-way within subjects designs** *[homework 5]*

		MDK Chapter 11
	Apr 25 (Wednesday)	**Practice session (1 hour)**
12.	Apr 30	**Higher-order within subjects designs** MDK Chapter 12
13.	May 7	**Review and practice**

The schedule may be modified during the semester depending on the progress with the material

Missed tests and assignments: There will be no makeup exams or opportunities for missed midterms. Missed midterms without adequate documentation will be given a mark of zero. For a missed midterm with adequate documentation, the weight of the midterm will be carried forward to the final exam. For medical excuses, adequate documentation comprises a medical certificate from AUBMC.

Communication: Please email me or meet with me if you have any questions about the course material, or if you need extra help. I will try to respond to emails within a 48 hour period. Please use the office hours to clarify material that you have not understood, or make an appointment with me if you need to.

Academic Integrity: All written assignments must be in your own words. Please refer to AUB Student Code of Conduct: http://website.aub.edu.lb/rep/cec/spaac/Documents/RevisedStudentCodeConduct.pdf and https://www.aub.edu.lb/it/services/students/plagiarism/Pages/home.aspx, which concerns academic misconduct including cheating, plagiarism, in-class disruption, and dishonesty. Please be aware that misconduct is vigorously prosecuted and that AUB has a zero tolerance policy. Evidence of cheating or plagiarism will result in course failure.

Disability: AUB strives to make learning experiences accessible for all. If you anticipate or experience academic barriers due to a visible or invisible disability (including mental health, chronic or temporary medical conditions), please inform me immediately so that we can discuss your options. To help establish reasonable accommodations and facilitate a smooth accommodations process, contact the Accessible Education Office (AEO), preferentially in the first few weeks of the semester: accessibility@aub.edu.lb; +961-1-350000, Ext. 3246; West Hall, 314. In all cases, you must provide me with an official AUB letter of accommodation from the AEO.

Non-discrimination: AUB is committed to facilitating a campus free of all forms of discrimination including sex/gender-based harassment prohibited by Title IX. The University's non-discrimination policy applies to, and protects, all students, faculty, and staff. If you think you have experienced discrimination or harassment, including sexual misconduct, we encourage you to tell someone promptly. If you speak to a faculty or staff member about an issue such as harassment, sexual violence, or discrimination, the information will be kept as private as possible, however, faculty and designated staff are required to bring it to the attention of the University's Title IX Coordinator. Faculty can refer you to fully confidential resources, and you can find information and contacts at www.aub.edu.lb/titleix. To report an incident, contact the University's Title IX Coordinator Trudi Hodges at 01-350000 ext. 2514, or titleix@aub.edu.lb. An anonymous report may be submitted online via EthicsPoint at www.aub.ethicspoint.com.