PSYC 305: Statistics for Experimental Design
Winter 2018

<u>Classes</u>
Lecture (McIntyre Medical Building 522)　　:　T 11:35 – 12:55
Computer Lab (2001 McGill College, #466) :　W/TR/F

Instructor　　　: Heungsun Hwang
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Office Hour　　: T 2:00 – 3:00 pm
TAs　　　　　　: Emilie Auger, Gyeongcheol Cho, Annik Gougeon

NOTE: This course outline is subject to change without prior notice.

<u>Prerequisite:</u> PSYC 204 or an equivalent introductory statistics course.

<u>Course Description:</u>
This course aims to introduce students to the basic concepts of statistical methods for the analysis of data obtained from experimental designs and other research studies. The course is hands-on, methodologically oriented. Upon completing this course, students are expected to have a working knowledge of the basic quantitative techniques and tools commonly used in psychology and other fields.

<u>Course Method:</u>
This course will utilize lectures and "hands-on" lab exercises. There are **<u>no</u>** textbooks required for the course. Nonetheless, the following books may be useful to facilitate an understanding of many topics/problems discussed in the class.

- Abdi, H., Edelman, B., Valentin, D., & Dowling, W. J. (2009). *Experimental Design and Analysis for Psychology.* Oxford: Oxford University Press.
- Ferguson, G. A., & Takane, Y. (1989). *Statistical Analysis in Psychology and Education (6th Edition). New York: McGraw-Hill.*
- Field, A. (2005). *Discovering Statistics Using SPSS (2nd Edition).* London: Sage Publications.
- Keppel, G., & Wickens, T. D. (2004). *Design and Analysis. A Researcher's Handbook (4th Edition).* New Jersey: Prentice Hall.

Each week, students are to participate in one lecture class (Tuesday) and one computer-lab class (Wednesday, Thursday, or Friday). The computer lab class will be given in **2001 McGill College, # 466**. In the lab class, under the guidance of a teaching assistant, students will learn how to use *SPSS* for the actual applications of the statistical methods that they have learned from lecture classes. Students can choose **<u>ONE</u>** of 12 lab sessions available as follows:

	LAB - 2001 McGill College #466	
Wednesday	Session 1	8:30 - 9:50 am
	Session 2	10:00 - 11:20 am
	Session 3	2:30 - 3:50 pm
	Session 4	4:00 – 5:20 pm
Thursday	Session 5	8:30 - 9:50 am
	Session 6	12:00 - 1:20 pm
	Session 7	1:30 - 2:50 pm
	Session 8	3:00 – 4:20 pm
Friday	Session 9	8:30 - 9:50 am
	Session 10	10:00 - 11:20 am
	Session 11	11:30 - 12:50 pm
	Session 12	1:00 – 2:20 pm

Students are required to decide which computer lab session they will attend during the semester, and to register for the session of their choice on Minerva. Note that the maximum number of students per session is **37**. Students are not permitted to register for the session that reaches this maximum capacity. Moreover, students are not allowed to move to other sessions after their session registration is complete.

Grading Policy:
Your course grade will be computed as follows:
- Individual assignments (8)   40 %   (5% per assignment)
- Mid-term exam   25 %
- Final exam   35 %

Mid-term and Final Exams:
Students will have a mid-term exam on March 1st (TR). The time and location will be announced. The mid-term exam will be based on multiple-choice questions which cover sessions 1-7, inclusively. There will be NO make-up exam for the midterm. The final exam will cover the entire course. Under special circumstances (e.g., illness, family emergency) the final exam will serve as a make-up midterm and count for 80% of the midterm grade. Both exams are closed-book.

Individual Assignments:
Working on an individual-basis, students are required to conduct in-depth quantitative analysis of various data sets by using SPSS. For all assignments, students are permitted to ask teaching assistants questions. However, they are not to discuss solutions/answers or what the solutions/answers should be, either with teaching assistants or with their fellow students prior to submission. If some students are suspected of not abiding by this requirement, they will be awarded a mark of 0 for that assignment. Ultimately, this requirement is imposed so that the assignments remain individual efforts. Students are required to submit all assignments by the end of computer lab class on assignment due date (refer to a tentative class schedule on page 4). Note that late assignments will not be accepted. Specific individual assignments are as follows:

- Assignment #1 : Descriptive statistics and t tests
- Assignment #2 : One-way ANOVA I & II
- Assignment #3 : Two-way ANOVA I & II
- Assignment #4 : One-way repeated measures ANOVA
- Assignment #5 : Nonparametric statistics
- Assignment #6 : Correlation and simple linear regression
- Assignment #7 : Multiple linear regression
- Assignment #8 : Analysis of covariance

Supplemental:
The passing grade for this course is a C. A supplemental or deferred exam will be available only for (1) those who obtain a D or F in the course; or (2) those who miss the scheduled final exam for an acceptable reason. A supplemental exam will be worth 80% of the final exam. Application to write a supplemental or deferred exam must be made to the Office of the Associate Dean of Arts/Science in Dawson Hall. The supplemental or deferred exam will be offered in the supplemental exam period.

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In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded. This does not apply to courses in which acquiring proficiency in a language is one of the objectives. *(Approved by Senate on 21 January 2009 - see also the section in this document on Assignments and Evaluation.)*

McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures
(see www.mcgill.ca/students/srr/honest/ for more information). *(Approved by Senate on 29 January 2003)*
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Tentative Class Schedule

Session		Lecture (MMB 522)		Computer Lab (2001 McGill College, # 466)	Assignment Due
1	Jan 11	~~Course overview & Basic statistics~~		No Lab	
2	Jan 16	~~Comparing one/two means~~	Jan 17/18/19	Basic SPSS exercise, descriptive statistics, z & t tests	Assignment #1
3	Jan 23	~~One-way ANOVA I~~	Jan 23/24/25	One-way ANOVA: Basic analyses	Assignment #2-1
4	Jan 30	~~One-way ANOVA II~~	Jan 31/Feb 1/2	One-way ANOVA: Advanced analyses	Assignment #2-2
5	Feb 6	~~Two-way ANOVA I~~	Feb 7/8/9	Two-way ANOVA: Basic analyses	Assignment #3-1
6	Feb 13	~~Two-way ANOVA II~~	Feb 14/15/16	Two-way ANOVA: Advanced analyses	Assignment #3-2
7	Feb 20	~~Repeated measures ANOVA~~	Feb 21/22/23	One-way repeated measures ANOVA	Assignment #4
8	Feb 27	Exam Review Midterm Exam (March 1)		No Lab	
9	Mar 6	Study Break			
10	Mar 13	Nonparametric statistics	Mar 14/15/16	Nonparametric statistics	Assignment #5
11	Mar 20	Correlation and simple linear regression	Mar 21/22/23	Correlation & simple linear regression	Assignment #6
12	Mar 27	Multiple linear regression	Mar 28/29/30	Multiple linear regression	Assignment #7
13	Apr 3	Analysis of covariance	Apr 4/5/6	Analysis of covariance	Assignment #8
14	Apr 10	No class		No Lab	