
POTH305

Statistics for Experimental Design For PT/OT

Overview

The statistical analysis of research data obtained from experimental designs is the main focus of this course.

The course can be divided to three parts: introduction and review of basic statistical concepts, different types of analysis of variance (ANOVA), simple and multiple linear regression. The course begins with the review of basic statistical concepts that was covered in PSYC204 or equivalent of it.

The second part of the course deals with statistical significant tests when we are dealing with more than two samples. It covers one-way ANOVA, two-way ANOVA and also covers different types of post hoc comparisons and prerequisite conditions that should be satisfied before we can conduct our ANOVA test

The last portion of the course introduces the method of studying the relationship between two variables (correlation) and simple and multiple regression analysis.

Prerequisite

POTH204 or an equivalent introductory statistics course.

Learning Outcomes

- 1- Students will learn the basic concept of hypothesis testing.
- 2- Students will learn how to compare single or two means with the help of student t-test.
- 3- They will learn the basic concept of different types of analysis of variance (ANOVA) and its prerequisite conditions that the data should satisfy.
- 4- Students can identify proper statistical test and assess other's use of statistical technique.
- 5- They will learn how to measure correlation of two variables and how predict one variable from one or more than one other variables.

Evaluation

The final grade will be based on a midterm exam (25%), final comprehensive final exam (40%), five assignments (35%, [Note1](#)).

Winter 2025

Instructor: Mohammad Darainy, PhD
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Office Hours: By appointment only

Optional Textbook

Field, A. (2017) Discovering Statistics Using IBM SPSS Statistics (5th Edition). Sage Publications.

Alternate textbook
Ferguson, G.A. & Takane, Y. Statistical Analysis in Psychology and Education (2005). New York: McGraw Hill. 6th edition.
(On course reserve at **Humanities and Social Sciences Library**)

Conferences

TA:

Email: statistics.psychology@mcgill.ca

Midterm

Date: TBA

Location: TBA

Inquiries:

All course related inquiries should be sent to the course email account. Your TA will monitor and answer your question and if it's necessary escalate it to the instructor. **You only email course instructor if you will or already missed the midterm exam to provide documentation or you would like to arrange a one-to-one meeting.**

Tentative Course Outline

| Class (tentative) | Topic | Computer Lab | Assignment due |
|--------------------------|---|--------------------------------|-----------------------|
| Week 1 | Review of Basic statistic concepts, compare one/two means | t-test | |
| Week 2 | One-way ANOVA I | | Assignment 1 |
| Week 3-1 | One-way ANOVA II | One-way ANOVA | |
| Week 3-2 | Two-way ANOVA I | One-way ANOVA II | |
| Week4 | Two-way ANOVA II | Two way ANOVA I | Assignment 2 |
| Week 5 | Repeated measure ANOVA | Two way ANOVA II | |
| Week 6 | Review | One-way Repeated measure ANOVA | Assignment 3 |
| Week 7 | Midterm | | |
| Week 8 | Correlation and simple linear regression | Correlation and regression | |
| Week 9 | Multiple linear regression | Correlation and regression II | |
| Week 10 | Analysis of Covariance | | Assignment 4 |
| Week 11 | Mixed Factor ANOVA I | Mixed Factor ANOVA | Assignment 5 |
| Week 12 | Mixed Factor ANOVA II | | Final report |

Note1:

Assignments:

This course will utilize lectures and “hands-on” lab exercises. Each student must follow both lectures which are delivered by Dr. Darainy and computer lab presentations which are delivered by your TAs. During the lecture classes the basic and theoretical aspect of statistical techniques will be discussed, while during the computer labs students will learn how to use JASP software for Windows. In total five individual-basis assignments were considered for this course. Students are required to conduct in-depth quantitative analysis of various data sets by using JASP for Windows. Specific individual assignments are as follows:

- 1- Descriptive statistics and t tests (4%)
- 2- Two-way ANOVA (6%)
- 3- Correlation and simple & Multiple linear regression (6%)
- 4- Analysis of Covariance (ANCOVA) (4%)
- 5- Final Report (15%)

Consequences of not completing assignments as requested:

Assignments must be submitted before the due date. Late submissions will incur a penalty of 5% of the total mark per day, including weekends, for up to three days following the due date. After this period, no further submissions will be accepted. If you require an extension, it is necessary to discuss the matter with the course instructor before the due date. Each extension request will be evaluated on a case-by-case basis. If you anticipate needing extra time due to a learning difficulty or ongoing illness, please request it in advance through the Student Accessibility & Achievement office.

Deferred/ Supplemental Exam:

If midterm is missed for valid and documented reasons* students should contact the course instructor within 48hrs. A make-up exam will be arranged with those who missed their midterm exam. However, for final examination, **don't contact course instructor** if you believe you are unable to write your final exam due to a serious health or other valid documented reasons, you may be eligible to apply for an exam deferral, depending on your faculty rules and regulations. **Please** submit your request in the deferred exam module on Minerva.

Course grade:

You must obtain at least 55% to pass this course, final letter grades will be assigned according to the following table:

| A | A- | B+ | B | B- | C+ | C | D | F |
|---------|--------|--------|--------|--------|--------|--------|--------|-------|
| 85-100% | 80-84% | 75-79% | 70-74% | 65-69% | 60-64% | 55-59% | 50-54% | 0-49% |

Students who received a D or F in the course, might be able to write a supplemental exam. A supplemental exam will be worth 80% of the final grade. Contact an advisor in your Student Affairs Office to discuss whether writing a supplemental exam is the right option for you. Applications can be made on Minerva as well.

*Valid reasons include, but are not limited to, sickness, family tragedy, court appointment, and participation in a formal event for which the scheduling is not at the discretion of the student, such as a concert or sports competition. Documentation, such as a doctor's note, a court summons, or a signed letter or direct email from the organizer of an official event must be provided within one week of the missed exam. In all instances, notify the instructor as soon as possible, and where practical, ahead of the to be missed exam.

Student Accessibility & Achievement (SAA):

SAA provides support and reasonable accommodation to students with documented disabilities. It is your responsibility to contact SAA as soon as possible if you think you need special accommodation.

Note2:

You may not be able to get credit for this course and other statistic courses. Be sure to check the Course Overlap section under Faculty Degree Requirements in the Arts or Science Section of the Calendar.

In the event of extraordinary circumstances beyond the University's, Department's, and/or Instructor's control, the content and/or evaluation scheme in this course is subject to change.

Plagiarism/Academic Integrity:

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. Please refer to McGill's policy on Academic Integrity and Code of Conduct.

<http://www.mcgill.ca/deanofstudents/plagiarism>

<http://www.mcgill.ca/students/srr/honest>

Right to submit in English or French written work that is to be graded:

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.

Conformément à la Charte des droits de l'étudiant de l'Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté (sauf dans le cas des cours dont l'un des objets est la maîtrise d'une langue).