YORK UNIVERSITY

FACULTY OF HEALTH

SCHOOL OF KINESIOLOGY AND HEALTH SCIENCE

HH KINE 2050 3.0 Analysis of Data in Kinesiology

Winter 2013 - 2014

Description

An introduction to the statistical analysis of experimental data. Students will simulate a variety of simple experiments involving behavioural concepts relevant to Kinesiology and analyze the data using basic descriptive and inferential statistics. Computer analysis of data will be introduced. Emphasis is on the use of statistics as a scientific tool and only the most elementary mathematical knowledge is required for entrance into the course.

Prerequisites   KINE 2049 3.0 (Research Methods in Kinesiology)

Course Instructor   Merv Mosher   359 Stong College
mmosher@yorku.ca   www.yorku.ca/mmosher

Computer Accounts: All students require a Moodle account, and a
FAS [File Access Service] account. It is expected
that students will check their Moodle accounts **daily**.
http://moodle.yorku.ca

Lab Instructors   T.B.A.

Course Hours   Lectures:

        (M) M W   10:30-11:30   LAS - A
        (N) M W   11:30-12:30   LAS - A

    Labs: 125 & 163 Chemistry Building
    Labs begin the week of January 13, 2014.

Required Texts and Equipment

An Introduction to Basic Statistics. (Horvath, T.) and Lecture Notes (Mosher)

KINE 2050 3.0 Laboratory Manual (2014 Edition).

**   Every student is required to have a portable **calculator.**

CALCULATORS ARE REQUIRED IN EVERY LECTURE AND LAB.

Graph paper is required for all figures/graphs done for lab assignments.

<u>Course Evaluation</u>
- Two written exams during term (optional)   40%
                    (Quiz 1 [20%] – **February 12**, 2014)
                    (Quiz 2 [20%] – **March 19**, 2014)
- Laboratory Assignments (optional)   10%
- Final Exam (**compulsory**)   50% - 100%

Students who do not write Mid-term 1 waive the right to receive "a specific percentage of graded feedback" prior to the drop date for the Winter term.

The percentage allocated for any course work not attempted/completed will be added to the final exam.

* All exams cover material from the lectures, readings and labs. *

In the event a mid-term exam is missed the percentage allocated to the exam will be added to the final. There are no make-up exams in the course.

> • Please note that students have 1 week after the posting of quiz results and answers to contact the course director about marking concerns.

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Although numerical marks are assigned to each piece of work
in this course there should be no assumption that a total
number of marks translates directly to a lettergrade.
Lettergrades will be determined by the descriptions in the
York University Undergraduate Calendar.
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<u>Lecture Topics</u>

1. Introduction to statistics, levels of measurement, population and sample, random sampling, accuracy of measurement, implied limits.
2. Frequency distributions, graphs.
3. Measures of Central Tendency
4. Measures of Dispersion
5. Normal Distribution
6. Z Scores
7. Probability
8. Sampling Distributions
9. Hypothesis Testing
10. The Difference Between Means (T-Test)
11. The Relationship Between Variables – Correlation
12. Prediction – Regression
13. Analysis of Variance - (ANOVA)
14. Chi Square

In addition, topics covered during the labs will include: 1) the use of computer software (SAS) to calculate descriptive, inferential and correlation statistics; 2) the collection, presentation and interpretation of data; 3) observational; correctional and experimental studies; 4) independent and dependent variables; 5) control and experimental groups; 6) conceptual and operational definitions.

Lab instructors: Teaching Assistants are available for 2 hours each week during your lab time. They DO NOT have office hours. It is your responsibility to ensure that you understand the weekly assignment BEFORE you leave the lab.

Drop Date: The last day to drop a Winter term course without receiving a grade is: **March 7, 2014**.

Lecture Capture:
Lectures will be digitally recorded and posted online. Please note the York University policy regarding this technology.

The York University Student Code of Conduct specifically prohibits theft of intellectual property, which includes recording a course director's lecture without his/her permission or taking lecture material provided on line, modifying it, and/or using it for your own personal use or gain. The material provided is only to be used for your personal study when you take the course for which it was created. Use in any other way will result, at the minimum, in sanctions in accordance with the York Code and, at the maximum, will be breaking federal, provincial or municipal laws and will be acted on accordingly.

IMPORTANT COURSE INFORMATION FOR STUDENTS

All students are expected to familiarize themselves with the following information, available on the York University Secretariat webpage (see Policies, Procedures and Regulations) http://www.yorku.ca/secretariat/policies/index-policies.html

• York's Academic Honesty Policy and Procedures/Academic Integrity Website

• Ethics Review Process for research involving human participants

• Course requirement accommodation for students with disabilities, including physical, medical, systemic, learning and psychiatric disabilities

• Student Conduct Standards

• Religious Observance Accommodation

Learning Expectations:

After completion of KINE 2050 3.0 [Analysis of Data in Kinesiology], students will understand fundamental statistical concepts and some of their basic applications in science and society. Students will be able to:

a) identify the level of measurement represented by a dataset.

b) calculate the appropriate descriptive statistics [measures of central tendency and variability], for a dataset.

c) construct the appropriate figure(s), [histograms, line charts, and scatterplots] to represent a dataset graphically.

d) describe the normal curve and solve word problems utilizing the z-score concept.

e) solve basic probability word problems.

f) state the null hypothesis for a given research problem.

g) select the appropriate statistical significance test to analyze a dataset.

h) calculate a test statistic and determine the associated p-value.

i) utilize a statistical software package to analyse data.

j) write a summary paragraph to describe the results of a significance test.

KINE 2050 3.0 Analysis of Data in Kinesiology. Winter 2013-2014
Note: The lecture topics and dates are approximate.

Week Beginning	Monday	Wednesday	Readings [Horvath text]	Laboratory
January 6	Introductory class	Intro to "Stats" Levels of measurement	Pages 1 - 15	Labs start week of January 13.
January 13	Organizing & Displaying data	Measures of Central Tendency	Pages 16 - 81	Lab 1
January 20	Measures of Variability	Percentiles & Z scores	Pages 82 - 112	Lab 2
January 27	Percentiles & Z scores	SEM Confidence Intervals	Pages 113 - 138	Lab 3
February 3	Probability	Probability	Pages 139 - 155	Lab 4
February 10	Probability	Quiz 1	Pages 156 - 168	Lab 5
February 17	Reading Week (Study break)	Reading Week (Study break)	Reading Week (Study break)	Reading Week (Study break)
February 24	Hypothesis testing	T-Tests	Pages 169 - 206	Lab 6
March 3	T-Tests	Correlation Regression	Pages 207 - 255	Lab 7 & 8
March 10	Correlation Regression	Chi Square	Pages 256 - 279	Lab 9
March 17	Chi Square	Quiz 2	Pages 256 - 279	Lab 10
March 24	Chi Square	ANOVA	Pages 280 - 302	Lab 11 & 12
March 31	ANOVA	ANOVA	Pages 303 - 332	Submit Lab 11 & 12
April 8-24	Exam period	Exam period	Exam period	Exam period