

YORK UNIVERSITY

FACULTY OF HEALTH

SCHOOL OF KINESIOLOGY AND HEALTH SCIENCE

## **HH KINE 2050 3.0 Analysis of Data in Kinesiology**

Winter 2018

### **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 Instructors**

Dr. Chris Ardern <a href="mailto:cardern@yorku.ca">cardern@yorku.ca</a>	352 Bethune College
Dr. Denise Henriques <a href="mailto:deniseh@yorku.ca">deniseh@yorku.ca</a>	305 Calumet College
Dr. Brad Meisner <a href="mailto:meisnerb@yorku.ca">meisnerb@yorku.ca</a>	356 Bethune College

**Office Hours:** See Moodle course site for Additional Details

**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.

<b><u>Course Hours</u></b>	<b><u>Lectures:</u></b> (Section M) M W 11:30 AM - 12:20 PM CLH - L (Section N) M W 12:30 PM - 1:20 PM CLH - L  <b><u>Labs:</u></b> 125, 125A, & 163 Chemistry Building  <b><u>Labs begin the week of January 15, 2018</u></b>
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## **Required Texts and Equipment**

An Introduction to Basic Statistics (Horvath, T.).

KINE 2050 3.0 Laboratory Manual (2018 Edition).

Note: lecture notes will be posted to the course moodle site on a week-by-week basis.

**\*\*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.\*\***

### **Course Evaluation**

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| - Two written exams during the term (optional) | 40%  |
|  | (Quiz #1 [20%] - <b><u>February 14</u></b> , 2018) |
|  | (Quiz #2 [20%] - <b><u>March 21</u></b> , 2018)    |
| - Laboratory assignments (optional)            | 10%  |
| - Final exam ( <b>compulsory</b> )             | 50% - 100%   |

***Students who do not write Quiz #1 waive their 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.***

\*Each exam may include material from the lectures, readings and labs, however, exams focus primarily on information covered in lectures and the labs.\*

***In the event a midterm quiz is missed the percentage allocated to that test will be added to the Final Exam. There are no make-up tests in the course.***

- Please note that students have one week after the posting of quiz results and answers to contact Dr. Brad Meisner about marking concerns.

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.

## **Lecture Topics**

1. Introduction to Statistics, Levels of Measurement, Population and Sample, Random Sampling, Accuracy of Measurement, Implied Limits [Instructor: Ardern]
2. Frequency Distributions, Graphs [Instructor: Ardern]
3. Measures of Central Tendency [Instructor: Ardern]
4. Measures of Dispersion [Instructor: Ardern]
5. Normal Distribution [Instructor: Ardern]
6. Z Scores [Instructor: Ardern]
7. Probability [Instructor: Henriques]
8. Sampling Distributions [Instructor: Henriques]
9. Hypothesis Testing [Instructor: Henriques]
10. The Difference Between Means (T-Test) [Instructor: Henriques]
11. The Relationship Between Variables – Correlation [Instructor: Henriques]
12. Prediction – Regression [Instructor: Henriques]
13. Analysis of Variance – (ANOVA) [Instructor: Meisner]
14. Chi Square [Instructor: Meisner]

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 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. 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 9, 2018.**

**Withdrawal Period:** March 10 - April 6, 2018

### **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.