University of Victoria
School of Exercise Science, Physical and Health Education
EPHE 591 BIOMEDICAL STATISTICS

Calendar Description
Units: 1.5   **Hours: 3**

The course will cover classic inferential statistics, select multivariate methods, the "New Statistics", and Bayesian methods of analysis. Students will also gain exposure to multiple statistical platforms including R, SPSS, and MATLAB.

Course Instructor
Olav E. Krigolson, PhD   Email: krigolson@gmail.com
Phone: 250 721 7843
Office: 187
Office Hours: By appointment

Meeting Times and Places

Class   Monday   5:00 to 7:20pm   MCK 155

Websites   www.krigolsonteaching.com

Learning Outcomes

At the end of this course, you will be able to:
1. Use the R programming environment to conduct sophisticated statistical analyses.
2. Understand and use the classic descriptive statistics to summarize data: mean, median, mode, variance, standard deviance, maxima, minima, range, confidence intervals.
3. Describe the central limit theory.
4. Discuss sampling theory and sampling distributions.
5. Understand and use correlation and regression.
6. Understand and use multiple regression.
7. Understand the logic of null hypothesis testing and its faults.
8. Understand and use t-tests and various ANOVA models.
9. Understand and discuss the concept of the general linear model.
10. Be familiar with the "New Statistics" as an alternative to classic null hypothesis testing.
11. Be familiar with simple Bayesian models as an alternative to classic null hypothesis testing.

Course Text and other Resources

It is ***strongly*** recommended that you purchase your own copy of "Discovering Statistics Using R" by Andy Field. Other R resources are available for free online however this book is the best and the easiest to read.

Additional readings and assignments will be posted online at www.krigolsonteaching.com

Assessment

Assignments	50%
Final	50%
Total	100%

Assessment Breakdown

Assignments   50% of course grade
                         Number: As set by the course instructor
                         Due: Final due date for all assignments is December 5th.

Throughout the semester the course instructor will hand out mandatory assignments. You will complete these at your discretion on your own or in the laboratory meeting time. Assignments can be discussed with the course instructor throughout the semester to ensure accuracy and understanding. At the end of the semester, a portfolio with all completed assignments needs to be submitted in HARD COPY including an assignment summary sheet (to be handed out later).

Final Exam   50% of course grade
                         20 short answer questions
                         University Exam Period

A final exam consisting of 20 short answer questions will be held during the university exam period. Students will be allowed to bring in a laptop computer and any resources they need to write the exam. Internet access will not be allowed.

Missing / Late Work

Any assignments submitted after December 5th will be assigned a grade of zero. If you are unable to write the final exam at the assigned time there will be a rewrite opportunity during the exam period in April of 2019.

Final Grade and Exam Redos

If at the end of the course you are unhappy with your grade or chances of success on the final exam a grade of B+ will be assigned assuming all assignments are completed and accurate. You will then be able to write the exam in any university exam period to improve your standing. If you receive a final grade after writing the final exam that you are unhappy with then you may also rewrite the final exam in a subsequent university exam period.

Course Outline

The course instructor reserves the right to change this course outline at his discretion as he feels fit to do. This course outline is not a binding contract.

Attendance

This is a graduate level course. Your attendance is expected and mandatory.

Previous Knowledge of Statistics

While this is an introductory course it is expected that you have a previous course background in statistics. Undertaking this course with no prior training will be very challenging.

Additional Information

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the Resource Centre for Students with a Disability (RCSD) as soon as possible. The RCSD staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations http://rcsd.uvic.ca/, the sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

Academic Integrity

Academic integrity is intellectual honesty and responsibility for academic work that you submit individual or group work. It involves commitment to the values of honesty, trust, and responsibility. It is expected that students will respect these ethical values in all activities related to learning, teaching, research, and service. Therefore, plagiarism and other acts against academic integrity are serious academic offences.
The responsibility of the institution
Instructors and academic units have the responsibility to ensure that standards of academic honesty are met. By doing so, the institution recognizes students for their hard work and assures them that other students do not have an unfair advantage through cheating on essays, exams, and projects.
The responsibility of the student
Plagiarism sometimes occurs due to a misunderstanding regarding the rules of academic integrity, but it is the responsibility of the student to know them. If you are unsure about the standards for citations or for referencing your sources, ask your instructor. Depending on the severity of the case, penalties include a warning, a failing grade, a record on the student's transcript, or a suspension.

It is your responsibility to understand the University's policy on academic integrity:

http://web.uvic.ca/calendar2012/FACS/UnIn/UARe/PoAcI.html

EPHE 591 Biomedical Statistics
Course Overview

September 10th	Introduction to R
September 17th	Visualizing Data
September 24rd	Correlation and Regression
October 1st	The Logic of NHST, Linear Models, and T-Tests
October 8th	ANOVA
October 15th	Posthoc Analysis
October 22nd	Non-Parametric Statistics
October 29th	Factorial ANOVA
November 5th	RM ANOVA and Mixed ANOVA
November 12th	Multivariate ANOVA
November 19th	Multiple Regression
November 26th	The New Statistics
December 3rd	Introduction to Bayesian Methods
University Exam Period	Final Exam