



School of Health & Exercise Sciences

HES 505: Quantitative Analyses: Decision Making Using Data in Health and Exercise Science

Fall 2024
3 Credits

*We respectfully acknowledge that the land on which this course is taught is the
unceded, ancestral, unsundered land of the Syilx Nation.*

Instructor: Alex Santos (he/him/his)
Office: ART 127
E-mail: alex.santos@ubc.ca
Office Hours: Mondays 4pm-5pm

Lecture Time & Location

Time: Mondays 11am-2pm
Location: FIP 133

Academic Calendar Course Description

How to analyze and interpret statistical data commonly encountered in health and exercise science research. Content includes the choice of appropriate statistical analyses, cleaning data, correlation, linear regression, multiple and logistic regression, t-tests and analyses of variance.

Methods of Delivery

In lectures, we will use a variety of learning methods, including lectures, group discussions, manipulation of data sets, the use of e-learning tools, and critical reflections on one's own research agenda. Asynchronous materials will help students solidify lecture information and provide opportunities to practice content learned.

Required Text

Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). Nelson Education Ltd.



Learning Outcomes

After completing this course, successful students will be able to:

1. Understand the foundations of statistical methods, including but not limited to central tendency, probability and the normal curve, sampling distribution techniques, population estimates, assumptions of statistical inferencing, and hypothesis testing techniques.
2. Calculate and demonstrate sufficient competence in basic quantitative data analysis.
3. Interpret results from health-related research that employs common statistical methods.
4. Create a statistical analysis plan to answer a research question of interest.

Evaluation Criteria and Grading

Weekly Engagement Activities	15%
Assignment 1: Problem Solving Worksheet	20%
Assignment 2: Critical Revision of a Research Article	25%
Assignment 3: Creating a Statistical Plan	40%

Weekly Engagement Activities

The purpose of these activities is to evaluate Learning Outcomes 1 and 2. Throughout the semester, a total of 8 activities accompanied by practice questions will be posted on Canvas by the end of Wednesday each week (please see timeline provided below). The purpose of the activities is to review content covered in the previous week and provide students with the opportunity to practice critical thinking questions related to the course content. Completing each activity correctly will be worth ~2% of the student's final grade. The activities will be available from Wednesdays until the **beginning of class on Mondays the following week**. More information about asynchronous content and procedures will be given in class.

Assignment 1: Problem Solving Worksheet

The purpose of this assignment is to evaluate Learning Outcomes 1 and 2. A worksheet will be provided to students with questions related to course content covered in the first 3 weeks. Answering the questions will require the use of SPSS and manual calculations. Students will have 2 weeks to complete this assignment. More information will be provided in class.



Assignment 2: Critical Revision of a Research Article

The purpose of this assignment is to evaluate Learning Outcomes 1 and 3. Students will be given a list of peer-reviewed, scientific articles relating to a sport or health-related field to choose from. Students are encouraged to choose an article that is interesting to them. Once the article has been identified, students will be asked to summarize and interpret the results section of the article. The summary will include but is not limited to the research question, types of hypotheses made by the authors, assumptions about the data, the number of groups and/or timepoints, the statistical analysis method(s) employed, the format in which the results were presented, and any conclusions and/or implications based on the results of the statistical test.

Further details and a detailed rubric will be provided to students via Canvas.

Assignment 3: Creating a Statistical Plan

The purpose of this assignment is to evaluate Learning Outcomes 1, 2 and 4. Students will need to create a video (~5-10 minutes) outlining a current or proposed research question for their graduate degree and talk through the rationale for a chosen statistical analysis plan based on the content of this course. Students are encouraged to be creative and have fun with this assignment while still covering the core components of their chosen plan. This assignment is also meant to help students become more comfortable with an “elevator pitch”, 3-minute thesis, or conference presentation briefly summarizing their research endeavours, which is an important skill to attain in graduate school.

Further details on what to include in your video, available tools and resources, and a rubric will be provided to students via Canvas.

Class Policies

Attendance

Lecture attendance is highly recommended as material discussed in class will be the substance of assignments. Students who attend lectures achieve higher grades. Class participation is encouraged and has also been found to lead to higher grades. The lecture slides and other resources will be available on Canvas, but it is impossible to duplicate the discussions, activities, challenges, and interactions that take place in the classroom.

If you are sick but still attending, please wear a mask to lecture. If you cannot attend or are unsure, please email your professor for guidance on how to catch up.



Late Policy

It is expected that weekly activities and assignments are submitted by the posted due date. These are meant to bolster learning through repetition and will assist in participation during the following week's activities. In cases where assignments are late, 10% of the eligible grade will be deducted **per day**. Assignments will not be accepted for marking more than five (5) days past the due date.

There are certain extenuating circumstances that will allow for further extension of an assignment due date. These are: health concerns, family emergency, travel for team sports. Please note that the instructor will not make accommodations for work schedule or other extracurricular activities. Please reach out to your instructor BEFORE the upcoming assignment due date and the instructor will determine eligibility for further extension on a case-by-case basis. The instructor may require that you submit written confirmation depending on the circumstances.

Final grades are not negotiable; this syllabus is the contract you agree to by registering for this course. No extra or additional assignments will be permitted to increase a student's grade at the end of the term. All students will be treated equally. Grade appeals are subject to university policies.

The Use of Artificial Intelligence

Students are permitted to use artificial intelligence tools, including generative AI, to gather information, review concepts or to help produce assignments. However, students are ultimately accountable for the work they submit, and any content generated or supported by an artificial intelligence tool **must be cited appropriately**.

Safety & Respect in the Classroom and Beyond

UBCO students have the right to work, learn and socialize in a supportive, safe, and healthy environment. The university is committed to developing a sense of community that is dedicated to creating a working and learning environment of the highest quality – one which is characterized by mutual respect, consideration, social and moral development of its members; and is free from harassment, discrimination and any form of disruptive behaviour or violence.

The university understands and recognizes that students have responsibilities related to appropriate student conduct. Students are responsible for reviewing relevant guidelines and policies.

Any student that demonstrates inappropriate behaviour; reckless behaviour that endangers themselves or others; or damages equipment will be asked to leave the class and, according to university policies, may be subject to further sanctions.



Please demonstrate professionalism and respect to the professor and other students, both in-person and virtually (i.e., e-mails). The professor of this course will ensure all possible steps are taken to guarantee a learning environment that is inclusive and equitable for all.

Tentative Course Timeline

Date	Topic	Assignment
Monday, Sep 9	Measurement, Variables, & Data	
Monday, Sep 16	Measures of Central Tendency & Variability	Weekly Activity 1 Due
Monday, Sep 23	The Normal Curve & Statistical Inferencing	Weekly Activity 2 Due
Monday, Sep 30	NO CLASS	
Monday, Oct 7	Hypothesis Testing & T-Tests	Weekly Activity 3 Due Assignment 1 Due
Monday, Oct 14	NO CLASS	
Monday, Oct 21	Error Rates & ANOVAs	Weekly Activity 4 Due
Monday, Oct 28	Linear Modelling with Kaja	Weekly Activity 5 Due
Monday, Nov 4	Correlations & Simple Linear Regressions	Weekly Activity 6 Due Assignment 2 Due
Monday, Nov 11	NO CLASS	
Monday, Nov 18	Multiple Linear Regressions	Weekly Activity 7 Due
Monday, Nov 25	N-of-1 Analysis with Haley	Weekly Activity 8 Due
Monday, Dec 2	Logistic Regressions & Non-Parametric Tests	Assignment 3 Due

Campus Policies

Academic Integrity

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise, and harsh sanctions are imposed. For example, incidences of plagiarism or cheating usually result in a failing grade or mark of zero on the assignment or in the course. Careful records are kept to monitor and prevent recidivism.

A more detailed description of academic integrity, including the University's policies and procedures, may be found in the Academic Calendar at:

<http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,54,111,0>



Grading Practices

Faculties, departments, and schools reserve the right to scale grades in order to maintain equity among sections and conformity to university, faculty, department, or school norms. Students should therefore note that an unofficial grade given by an instructor might be changed by the faculty, department, or school. Grades are not official until they appear on a student's academic record.

<http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,41,90,1014>

Student Services Resources

UBC Okanagan Disability Resource Centre

The DRC facilitates disability-related accommodations and programming initiatives to remove barriers for students with disabilities and ongoing medical conditions. If you require academic accommodations to achieve the objectives of a course, please contact the DRC at:

UNC 215 250.807.8053

email: drc.questions@ubc.ca

Web: www.students.ok.ubc.ca/drc

UBC Okanagan Equity and Inclusion Office

Through leadership, vision, and collaborative action, the Equity & Inclusion Office (EIO) develops action strategies in support of efforts to embed equity and inclusion in the daily operations across the campus. The EIO provides education and training from cultivating

respectful, inclusive spaces and communities to understanding unconscious/implicit bias and its operation within in campus environments. UBC Policy 3 prohibits discrimination and harassment based on BC's Human Rights Code. If you require assistance related to an issue of equity, educational programs, discrimination, or harassment please contact the EIO.

UNC 325H 250.807.9291

email: equity.ubco@ubc.ca

Web: www.equity.ok.ubc.ca

Student Wellness

At UBC Okanagan health services to students are provided by Student Wellness. Nurses, physicians and counsellors provide health care and counselling related to physical health, emotional/mental health and sexual/reproductive health concerns. As well, health promotion, education and research activities are provided to the campus



community. If you require assistance with your health, please contact Student Wellness for more information or to book an appointment.

UNC 337 250.807.9270
email: healthwellness.okanagan@ubc.ca
Web: www.students.ok.ubc.ca/health-wellness

Student Learning Hub

The Student Learning Hub is your go-to resource for free math, science, writing, and language learning support. The Hub welcomes undergraduate students from all disciplines and year levels to access a range of supports that include tutoring in math, sciences, languages, and writing, as well as help with study skills and learning strategies. Students are encouraged to visit often and early to build the skills, strategies and behaviors that are essential to being a confident and independent learner. For more information, please visit the Hub's website.

LIB 237 250.807.8491
email: learning.hub@ubc.ca
Web: www.students.ok.ubc.ca/slh

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Safewalk

*Don't want to walk alone at night? Not too sure how to get somewhere on campus? Call Safewalk at **250-807-8076**.*

For more information, see: www.security.ok.ubc.ca