

HH/KINE 3150 (3.0) Analysis of Data in Kinesiology II (Winter 2023)

Course Instructor

- Antony Chum, Ph.D. (chuma@yorku.ca).
 - Office: Stong Rm 301
 - Office Hours: Wednesdays and Fridays (2:30-4pm)

Course Hours

- Lecture: Fridays 08:30am at Bethune College 215
- Lab: Fridays 12:30pm at Chemistry Building 125

Course Description

This course focuses on the intermediate statistical analysis of health data. Students will learn a variety of techniques in inferential statistics to compare single and multiple groups, and explore relationships between variables. Computer analysis of data will be introduced in the R software package. Basic mathematical knowledge and computer skills are required for entrance into the course.

Prerequisites

KINE 2050 3.0 (Analysis of Data in Kinesiology) or KINE 2049 3.0 (Research Methods in Kinesiology)

Course Learning Objectives

After completion of KINE 3150 3.0 [Analysis of Data in Kinesiology II], students will understand fundamental statistical concepts and some of their basic applications in Kinesiology and Health Science. Students will be able to:

1. Calculate appropriate descriptive statistics for a dataset
2. Apply appropriate methods to perform statistical inference with continuous and categorical data
3. Understand and interpret regression analyses
4. Recognize the limitations of traditional statistical tools and apply fixes when statistical assumptions are violated
5. Utilise the R statistical software package to analyse data
6. Effectively communicate statistical results through report writing

Topics Covered

1. Introduction to R and RStudio
2. Review on univariate data analysis
 - Central limit theorem
 - Normal distribution
 - Z-score
 - Confidence intervals
 - Variance and Covariance
3. Classical tests
 - t-Test
 - Chi-square test
 - Correlation
 - One-way ANOVA
4. Linear regression
5. Multiple regression
6. Regression diagnostics and assumptions
7. Fixes for assumption violations
8. Categorical variables and dummy encoding
9. Interactions between covariates
10. Introduction to logistic regression
11. Other topics as necessary

Lab Structure

Labs will take place at Chemistry Building 125. At the end of each lab, you will have an assignment that is due the following Thursday at 5pm. You must upload your assignment on Moodle - submissions by print or email will **NOT** be accepted.

Course Evaluation

The final grade for the course will be based on the following items weighted as indicated:

- Labs - 72%
 - The first two labs will be worth in total with each lab worth 4% each of your final grade (8% total)
 - The remaining eight labs will be worth 8% each of your final grade (64% total)
- Class participation - 8%
 - Participation in class based activities / submissions
- Final Exam - 20%

Each lab submission missed will be counted toward the final exam instead. *Examples:*

- *Failure to submit lab #3: reweighted to 64% labs, 28% final exam*
- *Failure to submit lab #3 and lab #11: reweighted to 56% labs, 36% final exam*
- *Failure to submit all labs: 92% final exam*

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Grading: The grading scheme for the course conforms to the 9-point grading system used in undergraduate programs at York. The labs and final will bear either a letter grade designation or a corresponding number grade. Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.

Grade	Grade Point	Percent Range	Description
A+	9	90-100	Exceptional
A	8	80-89	Excellent
B+	7	75-79	Very Good
B	6	70-74	Good
C+	5	65-69	Competent
C	4	60-64	Fairly Competent
D+	3	55-59	Passing
D	2	50-54	Marginally Passing
E	1	(marginally below 50%)	Marginally Failing
F	0	(below 50%)	Failing

For a full description of York grading system see the York University Undergraduate Calendar - <http://calendars.registrar.yorku.ca/2010-2011/academic/index.htm>

Students may take a limited number of courses for degree credit on an ungraded (pass/fail) basis. For full information, please refer to York University's policy on Pass/Fail Option: <https://myacademicrecord.students.yorku.ca/pass-fail-option>

Assignment Submission: Proper academic performance depends on students doing their work not only well, but on time. Accordingly, lab assignments for this course must be received at 5pm on the Thursday following the lab.

Lateness Penalty: Since the lab assignments will be discussed in the following class/lab, no late submission will be accepted. Grades for missed labs will be allocated to your final exam.

Missed Final: Students with a documented reason for missing the course final exam, such as illness, compassionate grounds, etc., which is confirmed by supporting documentation (e.g. doctor's letter) may request accommodation from the Course Instructor. Further extensions or accommodation will require students to submit a formal petition to the Faculty of Health: <https://www.yorku.ca/health/petition-information-and-package/>

IMPORTANT COURSE INFORMATION FOR STUDENTS

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All students are expected to familiarise themselves with the following information, available on the Senate Committee on Academic Standards, Curriculum & Pedagogy webpage:

<https://secretariat.info.yorku.ca/files/CourseInformationForStudentsAugust2012-.pdf>

- Senate Policy on Academic Honesty and the 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

Key Dates

<https://registrar.yorku.ca/enrol/dates/2022-2023/fall-winter>

- Jan 9 Semester start
- Jan 13 First day of class
- Feb 18-24 Reading week (**no class**)
- Mar 17 Last day to drop classes *without* “W”
- Apr 10:
 - Last day of classes
 - Last day to submit work
 - Last day to drop *with* “W”
- Apr 11 Winter Study Day (**no class**)
- Apr 12 - 27 Winter Exams
- *TBD* Final Exam for KINE 3150

Course Schedule

[Detailed Course Calendar](#)

Weeks / Date*	Topic*	Lab Due
Week 1 (2023-01-13)	Syllabus; introduction to R and RStudio	No lab hand-in
Week 2 (2022-01-20)	Review: univariate statistics, central limit theorem; statistics with R	Week 2 Lab Due 2023-01-26 at 5pm
Week 3 (2023-01-27)	z-score, normal distribution, confidence intervals	Week 3 Lab Due 2022-02-02 at 5pm
Week 4 (2023-02-03)	Correlations	Week 4 Lab Due 2023-02-09 at 5pm
Week 5 (2023-02-10)	Classical tests: t-tests, chi-square, 1-way ANOVA/Kruskal-Wallis	Week 5 Lab Due 2023-02-16 at 5pm
Week 6 (2023-02-17)	Linear Regression	Week 6 Lab Due 2023-02-23 at 5pm

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Week 7 (2023-02-24)	<i>[Winter reading week - no class]</i>	
Week 8 (2023-03-03)	Multiple regression	Week 8 Lab Due 2023-03-09 at 5pm
Week 9 (2023-03-10)	Regression interactions	Week 9 Lab Due 2023-03-16 at 5pm
Week 10 (2023-03-17)	Logistic regression	Week 10 Lab Due 2023-03-23 at 5pm
Week 11 (2023-03-24)	Fixed-effect models for longitudinal analysis	Week 11 Lab Due 2023-03-30 at 5pm
Week 12 (2023-03-31)	Applications in randomised controlled trials	Week 12 Lab Due 2023-04-06 at 5pm
Week 13 (2023-04-07)	Exam Review	No lab hand-in

*Topics covered and dates are subject to change

Suggested Readings

- R for Beginners: https://cran.r-project.org/doc/contrib/Paradis-rdebuts_en.pdf
- Introduction to R: <https://cran.r-project.org/doc/manuals/r-release/R-intro.pdf>
- ReMInDeRy - York University R resources: <https://remindery.info.yorku.ca/other-resources/>

Additional readings may be assigned or recommended during the course.

Additional Resources

Please Take Care of Yourself and Each Other: We continue to deal with the impact of COVID-19 and its far-reaching consequences. Please be kind and gentle with yourselves and others. There are a number of online free resources available to help support you. If you need help, the following list of websites (this is not an exhaustive list) may be a good place for you to start:

- <https://good2talk.ca/>
- <https://counselling.students.yorku.ca/>
- <https://yubettertogether.info.yorku.ca>
- <https://yorkinternational.yorku.ca/>

HH/KINE 3150 is deeply committed to respecting diversity, inclusivity, and equity for all. Throughout the year, we will engage in discussion and dialogue with one another about complex issues in efforts to expand our understanding of our social world. Our conversations with one another may not always be comfortable, and we may need courage, patience, forgiveness, and generosity as we engage with the texts, with our own ideas and assumptions, and with one another. Collectively, we must protect our educational space for respectful but critical interrogation of ideas, and we must protect our diversity of thought and experience as a source of knowledge and strength. Our values in KINE 3150 directly align with the University's commitment to education without discrimination based on race, national or ethnic origin, colour, religion, sex, age or mental or physical disability. For

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additional information on support, resources, and educational opportunities on equity, diversity, and inclusion at York University, please visit the Centre for Human Rights, Equity and Inclusion at: <https://rights.info.yorku.ca/>

Calumet and Stong Colleges' Student Success Programming: Calumet and Stong Colleges aim to support the success of Faculty of Health students through a variety of free programs throughout their university career:

- [Orientation](#) helps new students transition into university, discover campus resources, and establish social and academic networks.
- [Peer Mentoring](#) connects well-trained upper-year students with first year and transfer students to help them transition into university.
- [Course Representative Program](#) supports the academic success and resourcefulness of students in core program courses through in-class announcements.
- [Peer-Assisted Study Sessions \(PASS\)](#) involve upper-level academically successful and well-trained students who facilitate study sessions in courses that are historically challenging.
- [Peer Tutoring](#) offers one-on-one academic support by well-trained Peer Tutors.

Please connect with your Course Director about any specific academic resources for this class.

Calumet and Stong Colleges also support students' Health & Wellness, leadership and professional skills development, student/community engagement and wellbeing, Career Exploration, Indigenous Circle, awards and recognition, and provide opportunities to students to work or volunteer.

For additional resources/information about Calumet and Stong Colleges' Student Success Programs, please consult our websites (Calumet College; Stong College), email scchelp@yorku.ca, and/or follow us on Instagram (Calumet College; Stong College), Facebook (Calumet College; Stong College) and LinkedIn.

Are you receiving our weekly email (Subject: "Calumet and Stong Colleges - Upcoming events")? If not, please check your Inbox and Junk folders, and if it's not there then please contact ccscadm@yorku.ca, and request to be added to the listserv. Also, make sure to add your 'preferred email' to your Passport York personal profile to make sure you receive important news and information.