School of Health Studies

Western HealthSciences



HS3801B: Measurement and Analysis in Health Sciences

Winter | 2025

Prerequisite(s):
Health Sciences 2800 or Health Sciences 2801A/B.

Antirequisite(s):
Biology 2244A/B, Economics 2122A/B, Economics 2222A/B, Geography 2210A/B, Kinesiology 3032A/B, MOS 2242A/B, Psychology 2810, Psychology 2820E, Psychology 2830A/B, Psychology 2850A/B, Psychology 2851A/B, Social Work 2207A/B, Sociology 2205A/B, Statistical Sciences 2035, Statistical Sciences 2141A/B, Statistical Sciences 2143A/B, Statistical Sciences 2244A/B, Statistical Sciences 2858A/B.

Course Information

Instructor Name: Dr. Andrew Johnson, PhD (he/him)
Email: ajohnson@uwo.ca
Office Hours Day / Time: TBA
Location: TBA
Lectures Day / Time: TBA
Tutorials Day / Time: TBA

Land Acknowledgement

We acknowledge that Western University is located on the traditional territories of the Anishinaabek, Haudenosaunee, Lūnaapéewak and Chonnonton Nations, on lands connected with the London Township and Sombra Treaties of 1796 and the Dish with One Spoon Covenant Wampum. This land continues to be home to diverse Indigenous Peoples whom we recognize as contemporary stewards of the land and vital contributors of our society.

Accessibility Acknowledgement

Meaningful ways to incorporate equity into the student experience are important to the School of Health studies. To that end, we honour all manner of differences inherent within the student population and incorporate accessible options for inclusion to the best of our abilities in each course offering

Course Description

An introduction to measurement and analysis in Health Sciences research, covering topics such as validity, reliability, standard errors, confidence intervals, tests of means, correlation, and linear regression.

Learning Outcomes

In this course, you will be introduced to statistical analyses in Health Sciences research, with an emphasis on learning how the analyses are conducted by hand. By the end of the course, you will be comfortable with the theory and mechanics of calculating measures of central tendency and dispersion, standard scores, t-tests (both independent and dependent), bivariate correlation and regression, simple chi-square calculations for frequency distributions, and simple ANOVAs (both independent and dependent).

Course Format and Timetable

Week of:	**Lecture Topic(s)**	**Online Quiz Due**
2025.01.06	Describing Data	2025.01.16
2025.01.13	Hypothesis Testing	2025.01.23
2025.01.20	Single Sample Inference	2025.01.30
2025.01.27	Independent Groups t-test	2025.02.06
2025.02.03	Dependent Groups t-test	2025.02.13
2025.02.10	Correlation & Regression	2025.02.27
2025.02.17	*No class – Reading Week*	
2025.02.24	Univariate Count Data	2025.03.06
2025.03.03	Bivariate Count Data	2025.03.13
2025.03.10	Independent Groups ANOVA	2025.03.20
2025.03.17	Dependent Groups ANOVA	2025.03.27
2025.03.24	Midterm Review	
2025.03.31	Catch-up & Review	

Required Course Material:

Textbook

There are no *required* textbooks for this course. If you wish to have a textbook for the course, I recommend the OpenStax text by Illowsky et al. The PDF of this text is available for free through the bookstore, or you may purchase a professionally bound copy for approximately $40 through Amazon.com. More information can be found here:

https://openstax.org/details/introductory-statistics

Calculator

You will need a calculator with a "stats mode" for this course. The device should be easy to use – I would recommend that you avoid calculators that have functions and capabilities that are not required for this course. A calculator sufficient for this course should cost approximately $15 to $35. It is advisable to have your calculator available for all lectures, homework assignments, tests, quizzes, and assignments.

Evaluation

Assessment	Format	Weight	Due Date	Flexibility
Quizzes	Multiple Choice	3% each	Throughout	All quizzes are optional
Peerwise Part 1	Multiple Choice	2.5%	2025.02.27	Optional assignment
Peerwise Part 2	Multiple Choice	2.5%	2025.03.27	Optional assignment
Midterm	Multiple Choice	25%	2025.03.01	None
Final Exam*	Multiple Choice	40%	TBA	None

**** you must achieve a passing grade on the final exam to pass the course***

Optional Online Quizzes

I have posted ten (10) online quizzes to help you review exam material. These online quizzes will be multiple-choice and are (obviously) open-book examinations. You should plan to use a calculator for all of these quizzes. My expectation is that you will do these quizzes individually, and not with your classmates. You will have 30 minutes to complete each quiz, starting from the time you first open the quiz. Each quiz may be submitted only once. Quizzes are due at 9:55pm on the dates noted within the course schedule. Late quizzes will not be accepted, nor will makeup tests be given, as question-level feedback will be released the day after each quiz is due. These quizzes are wholly optional. Each quiz that you complete is worth 3% of your final grade. The value of any missed quizzes will be distributed amongst all other assessments in the course (i.e., not just amongst the optional online quizzes). *This means that you cannot seek academic consideration for missed online quizzes, because academic consideration will automatically be applied to any missed quiz (in the form of re-weighting the remainder of your assessments).*

Optional Peerwise Assignment

One of the most frequent requests that I receive from students is for more sample questions. To address this need, we will be using PeerWise as a place for you to create, share and evaluate assessment questions with your classmates. There are two opportunities to earn grades through the use of PeerWise in this course. The first Peerwise assignment is due on February 27th and the second is due on March 27th. Both are due at 9:55pm.

Start by visiting PeerWise. If you have not used PeerWise before, just click the "Registration" link and follow the prompts to choose a username and a password for your account. If you have used PeerWise before, simply log in and then select "Join course" from the Home menu.

To access our course, "HS 3032B (January to April, 2025)", you will need to enter two pieces of information:

1. *Course ID = 27278*
2. *Identifier = your UWO username (the part before the "@uwo.ca")*

You don't need to (and probably shouldn't) use your UWO password when registering.

Participation in the Peerwise Assignment is wholly optional. Both of the assignments are worth 2.5% of your final grade. *You will earn full marks by contributing 5 questions to the PeerWise question bank AND answering 5 of the questions posted by your classmates. Failure to complete either of these activities (i.e., contributing questions or answering questions) will lead to you receiving no credit for participation in this assessment.* Late contributions will not be considered for course credit, and the value of any missed grading components will be distributed amongst all other assessments in the course (i.e., not just amongst the optional Peerwise Assignment components). *This means that you cannot seek academic consideration for any part of this assignment, because academic consideration will automatically be applied to any component (in the form of re-weighting the remainder of your assessments).*

Midterm

The midterm for this course will cover all course material (in readings, supplemental materials presented through OWL, lecture videos, and in tutorials) presented between 2025.01.06 and 2025.02.14 (i.e., up to and including our unit on correlation and regression). This test will consist solely of multiple-choice questions. You will probably want to have a calculator for this exam. You will have three hours to complete the test. This test is not open book, but you will be provided with a formula sheet and statistical tables with your testing package. **Note that this assessment is considered central to the assessment of learning outcomes in this course. Accordingly, you must provide documentation for any absence from this evaluation.** If you miss this evaluation, you must complete the makeup assessment as listed in the "Makeup Exams" section of this course outline. **As the makeup assessment is tied to the midterm, you must provide documentation for any absence from the makeup. Failure to receive an academic consideration for a missed midterm or makeup will result in a grade of zero on that evaluation.**

Final Exam

The final exam for this course will cover all material presented throughout the term (in readings, supplemental materials presented through OWL, lecture videos, and in tutorials). This exam will consist solely of multiple-choice questions. You will need a calculator for this exam. You will have three hours to complete the examination and it will be held during the final exam period. This exam is not open book, but you will be provided with a formula sheet and statistical tables with your testing package. **You must achieve a passing grade on this assessment, in order to pass the course.**

NOTE: Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating

Makeup Exams

You must have a valid medical or compassionate reason for missing the midterm or the final exam, and you must seek an academic consideration for either of these evaluations through academic advising within the School of Health Studies.

The makeup for the midterm will be held on Sunday, March 9th, between 12pm and 3pm. The room number for this makeup exam will be posted closer to the time of the makeup. *NOTE: There is no second makeup examination for the midterm in this course. If you are unable to write the midterm makeup (for any reason) the value of your midterm will be shifted to your final exam.*

The makeup for the final exam will be held in May. The date, time, and location of this Special Exam will be posted to Brightspace in April.

Support Services

There are various support services around campus and these include, but are not limited to:

1. Academic Support and Engagement - http://academicsupport.uwo.ca
2. Wellness and Well-being - https://www.uwo.ca/health/
3. Registrar's Office -- http://www.registrar.uwo.ca/
4. Ombuds Office -- http://www.uwo.ca/ombuds/

The websites for Registrarial Services (http://www.registrar.uwo.ca), and the same for affiliated university colleges when appropriate, and any appropriate Student Support Services (including the services provided by the USC listed here: http://westernusc.ca/services/) and the Student Development Services, should be provided for easy access.

Students who are in emotional/mental distress should refer to Mental Health@Western (https://www.uwo.ca/health/) for a complete list of options about how to obtain help.

Statement on Gender-Based and Sexual Violence
Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at: https://www.uwo.ca/health/student_support/survivor_support/get-help.html

Student Code of Conduct
The purpose of the Code of Student Conduct is to define the general standard of conduct expected of students registered at Western University, provide examples of behaviour that constitutes a breach of this standard of conduct, provide examples of sanctions that may be imposed and set out the disciplinary procedures that the University will follow. For more information, visit https://www.uwo.ca/univsec/pdf/board/code.pdf

Absence from Course Commitments
Students must familiarize themselves with the Policy on Academic Consideration – Undergraduate Students in First Entry Programs

Students missing course work for medical, compassionate, or extenuating circumstances can request academic consideration by completing a request at the central academic consideration portal. Students are permitted one academic consideration request per course per term **without** supporting documentation. Note that supporting documentation is **always** required for academic consideration requests for examinations scheduled by the office of the registrar (e.g., December and April exams) and for practical laboratory and performance tests (typically scheduled during the last week of the term).

Students should also note that the instructor may **designate** one assessment per course per term that requires supporting documentation. This designated assessment is described elsewhere in this document. Academic consideration requests may be denied when flexibility in assessment has already been included.

Examples of flexibility in assessment include when there are assessments not required for calculation of the final grade (e.g. 8 out of 10 quizzes), when there is flexibility in the submission timeframe (e.g. 72 hour no late penalty period), or when timed assessments (e.g., quizzes) are available over an extended period of time (e.g., when you are given a 72 hour time period to start – and finish – the assessment).

Please note that any academic considerations granted in this course will be determined by the instructor of this course, in consultation with the academic advisors in your Faculty of Registration, in accordance with information presented in this course syllabus. Supporting documentation for academic considerations for absences due to illness should use the Student Medical Certificate or, where that is not possible, equivalent documentation by a health care practitioner.

Accommodation for Religious Holidays
Students should review the policy for Accommodation for Religious Holidays. Where a student will be unable to write examinations and term tests due to a conflicting religious holiday, they should inform their instructors as soon as possible but not later than two weeks prior to writing the examination/term test. In the case of conflict with a midterm test, students should inform their instructor as soon as possible but not later than one week prior to the midterm.

Special Examinations
A Special Examination is any examination other than the regular examination, and it may be offered only with the permission of the Dean of the Faculty in which the student is registered, in consultation with the instructor and Department Chair. Permission to write a Special Examination may be given on the basis of compassionate or medical grounds with appropriate supporting documents. To provide an opportunity for students to recover from the circumstances resulting in a Special Examination, the University has implemented Special Examination dates. The Faculty of Health Sciences has set School-specific dates for these Special Examinations. Please speak with your instructor about the date on which the Special Examination for this course will be held.

Academic Offences
Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following website: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

Plagiarism
Student work is expected to be original. Plagiarism is a serious academic offence and could lead to a zero on the assignment in question, a zero in this course, or your expulsion from the university. You are plagiarizing if you insert a phrase, sentence or paragraph taken directly from another author without acknowledging that the work belongs to him/her. Similarly, you are plagiarizing if you paraphrase or summarize another author's ideas without acknowledging that the ideas belong to someone else. All papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between Western University and Turnitin.com (www.turnitin.com).

Use of Artificial Intelligence for the Completion of Course Work
Within this course, you may only use artificial intelligence tools (e.g., "ChatGPT") in ways that are specifically authorized by the course instructor. All submitted work must reflect your own thoughts and independent written work.

Re-submission of Previously Graded Material
Without the explicit written permission of the instructor, you may not submit any academic work for which credit has been obtained previously, or for which credit is being sought, in another course or program of study in the University or elsewhere.

Use of Statistical Pattern Recognition on Multiple Choice Exams
Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

Accessibility Statement

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Accessible Education (AE) at 661-2111 x 82147 for any specific question regarding an accommodation or review The policy on Accommodation for Students with Disabilities

Correspondence Statement

The centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner. Students are further expected to attend to announcements presented through Brightspace, and to read emails generated in this way.

Use of Electronic Devices

During Exams

Unless you have medical accommodations that require you to do so, or explicit permission from the instructor of the course, you may not use any electronic devices (e.g., cell phones, tablets, cameras, smart glass, smart watches, or iPods) during ANY tests, quizzes, midterms, examinations, or other in-class evaluations. **These devices MUST either be left at home or with your belongings at the front of the room. They MUST NOT be at your test/exam desk or in your pocket. Any student found with a prohibited device will receive an automatic grade of zero on the test or exam.**

During Lectures and Tutorials

Although you are welcome to use a computer during lecture and tutorial periods, you are expected to use the computer for scholastic purposes only, and refrain from engaging in any activities that may distract other students from learning. From time to time, your professor may ask the class to turn off all computers, to facilitate learning or discussion of the material presented in a particular class.

Academic Considerations and Absences from Lectures and Assessments

Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request (in writing) any necessary academic considerations at least two weeks prior to the holiday to the academic counsellors in their Home Department. Additional information is provided in the Western Multicultural Calendar.

Academic Accommodation

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. Students with ongoing accommodation needs within this course are also encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found here.

Academic Consideration

The University recognizes that a student's ability to meet their academic responsibilities may, on occasion, be impaired by extenuating circumstances that are medical or compassionate in nature. These extenuating circumstances may be acute (short term), or it may be chronic (long term), or chronic with acute episodes. In all cases, students are advised to consult with the academic

counsellors in their home units, at their earliest opportunity. Academic counsellors may refer students to Accessible Education for ongoing academic accommodations.
Most forms of academic consideration require documentation, and this documentation is to be submitted to academic advisors within 48 hours of the missed assessment. Any such documents will be retained in the student's file, and will be held in confidence in accordance with the University's Official Student Record Information Privacy Policy. Once the petition and supporting documents have been received and assessed, appropriate academic considerations shall be determined by academic advising, in consultation with the student's instructor(s). Academic considerations may include extension of deadlines, waiver of attendance requirements for classes/labs/tutorials, arranging Special Exams or Incompletes, re-weighting course requirements, or granting late withdrawals without academic penalty. Academic considerations shall be granted only where the documentation indicates that the onset, duration and severity of the illness are such that the student could not reasonably be expected to complete their academic responsibilities. (Note – it will not be sufficient to provide documentation indicating simply that the student "was seen for a medical reason" or "was ill.").

Whenever possible, students who require academic considerations should provide notification and documentation in advance of due dates, examinations, etc. Under no circumstances are students expected to submit rationales for (or documentation of) any absences, to course instructors. Students are, however, required to follow-up with course instructors, in a timely fashion, to identify the ways in which the academic consideration will be implemented.

Examination Conflicts
A student completing tests or examinations with flexible submission times (e.g., where one or more evaluation is a take-home assessment) cannot request alternative arrangements unless a conflict cannot be avoided by rescheduling writing the exam to a different time within the window specified by the instructor. This applies to direct conflicts as well as "heavy load" conflicts (e.g., three exams within a 23-hour period). The student should discuss any concerns about a potential conflict and/or request academic considerations with their academic counselling unit prior to the deadline to drop a course without academic penalty

In the case of online tests and examinations, use of a "Conflict Room," wherein student can write two proctored exams concurrently, will be interpreted as arrangements for continuous proctoring.

Copyright and Audio/Video Recording Statement
Course material produced by faculty is copyrighted and to reproduce this material for any purposes other than your own educational use contravenes Canadian Copyright Laws. Unless explicitly noted otherwise, you may not make audio or video recordings of lectures – nor may you edit, re-use, distribute, or rebroadcast any of the material posted to the course website.

Contingency Plan for an In-Person Class Pivoting to 100% Online Learning
In the event of a situation that requires this course to pivot to online content delivery, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on Brightspace for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor

Note that disruptive behaviour of any type during online classes, including inappropriate use of the chat function, is unacceptable. Students found guilty of Zoom-bombing a class or of other serious online offenses may be subject to disciplinary measures under the Code of Student Conduct.

Online Proctoring
Tests and examinations in this course may be conducted using a remote proctoring service. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide **personal information** (including some biometric data) and the session will be **recorded**. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at: https://remoteproctoring.uwo.ca

Appealing a Grade Within this Course
You have the right to appeal any grade within this course. The grounds for a grade appeal may be one or more of: medical or compassionate circumstances, extenuating circumstances beyond the student's control, bias, inaccuracy, or unfairness. All grounds advanced in a request for relief must be supported by a clear and detailed explanation of the reasons for the request together with all supporting documentation.

Appeals generally proceed in this order:
1. Course instructor (informal consultation)
2. Department Chair (submission of written request)
3. The Dean of the Faculty (submission of written request)

In the case of perceived procedural unfairness, steps 2 and 3 are carried out within the Department and Faculty offering the course. In the case of extenuating medical or compassionate circumstances that impact on a grade, steps 2 and 3 are carried out within a student's Home Department and Faculty.

A request for relief against a mark or grade must be initiated with the instructor as soon as possible after the mark is issued. In the event that the instructor is not available to the student, or fails to act, or if the matter is not resolved satisfactorily with the instructor, a written request for relief must be submitted to the Chair of the Department within three weeks of the date that the mark was issued. In the case of a final grade in a course, the written request for relief must be submitted to the Chair of the department by January 31st (for first-term half courses) or June 30th (for second-term half courses or full-year courses

Grades
Where possible assignment objectives and rubrics will be posted on OWL. Generally, students can expect some form of feedback on their performance in a course before the drop date.

A+	90-100	One could scarcely expect better from a student at this level
A	80-89	Superior work that is clearly above average
B	70-79	Good work, meeting all requirements and eminently satisfactory
C	60-69	Competent work, meeting requirements
D	50-59	Fair work, minimally acceptable.
F	Below 50	Fail

Rounding of Grades (for example, bumping a 79 to 80%):
This is a practice some students request. The final grade documented is the grade that you have achieved. There is no rounding to the next grade level, or 'giving away' of marks. Please don't ask me to do this for you; the response will be "please review the course outline where this is presented".