

**THE UNIVERSITY OF WESTERN ONTARIO
LONDON CANADA**

School of Health Studies

**Health Sciences 3801B
Measurement and Analysis in the Health Sciences**

1.0 CALENDAR 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.

Prerequisites: [Health Sciences 2801](#) or the former Health Sciences 2800.

Antirequisites: [Biology 2244A/B](#), [Economics 2122A/B](#), [Economics 2222A/B](#), [Geography 2210A/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](#), [Statistical Sciences 2037A/B](#) if taken prior to Fall 2010, former Psychology 2885 (Brescia), former Statistical Sciences 2122A/B, former Social Work 2205.

Note regarding prerequisite checking

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

2.0 COURSE INFORMATION

Instructor: Dr. Andrew Johnson
ajohnson@uwo.ca

Office Hours: By appointment and via Zoom (see OWL signup for details)

Course Website: <https://owl.uwo.ca>

3.1 TEXTBOOKS

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 OpenStax.org, or [you may purchase a professionally bound copy](#) for approximately \$40 through Amazon.ca. More information can be found here:

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

3.2 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.

4.0 COURSE OBJECTIVES

In this course, you will be introduced to statistical analyses in the health sciences, 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).

5.1 EVALUATION

Online Quizzes	throughout the course	20%
Midterm	2021.03.05	30%
Final Exam	TBA (during final exam period)	40%
Contributions to Self-Testing	throughout the course	10%

Online Quizzes: I have created seven online quizzes to help you review exam material. These online quizzes will be strictly 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 (i.e., if you close your browser, the timer will continue to run). 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, as question-level feedback will be released the day after each quiz is due. Students receiving academic consideration, or who use self-reported absences for periods of time that include a quiz due date, will have the value of missed quiz(zes) distributed amongst the remaining quizzes. This adjustment will be done at the end of the course.

Midterm: The midterm for this course will cover all course material (in readings, supplemental materials presented through OWL, or in lecture videos) presented between 2021.01.11 and 2021.02.26 (i.e., up to and including our unit on correlation and regression). This test will consist of some combination of multiple-choice questions, short-answer questions, and calculation questions. You will probably want to have a calculator for this exam. You will have two hours to complete the examination, and the exam will be available between 9am and 3pm on March 5th (i.e., you must complete your exam within that time frame).

Final Exam: The final exam for this course will cover **all** material presented throughout the term. The exam will consist of some combination of multiple-choice questions, short-answer questions, and calculation questions. You will need a calculator for the exam. This exam will be held during the final exam period.

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

Contributions to Self-Testing: 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. *Your grade will be based on the number and quality of the questions you create – as well as your review of (and comments on) questions created by your peers.* If everyone contributes fully to this participation activity, we will have more than 2000 questions in our course test bank by the time you are ready to self-test in preparation for the final exam.

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 3801B (January to April, 2021)", you will need to enter two pieces of information:

1. Course ID = **21459**
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.

Your participation grade in Peerwise will be based on your **PeerWise Reputation score**. This **Reputation score** is composed of three components – each of which is calculated based on the work you carry out in Peerwise. The first component is for authoring questions, the second component is for answering questions, and the third component is for rating questions you have answered. Your component scores increase whenever the actions of other students generally agree with your earlier answers (be it to questions you have authored, or to questions that you have answered). In this sense, to accumulate high component scores, you should plan to make thoughtful contributions as early as possible (which are therefore more likely to agree with the answers that other students make later on). Your total Reputation score is calculated using a formula that combines the component scores such that to achieve a high total score it is much better to have good scores for each component rather than a very high score in just one (or two) components. The lowest possible Reputation score is 1 (every student starts with a score of 1). You will have access to your reputation score, throughout the course – and will also be able to view the course leaderboard on an ongoing basis.

At the end of the course, I will identify your reputation percentile (i.e., the % of students that achieved a reputation score lower than yours). Participation scores will be assigned as follows:

Reputation Percentile	Participation Grade (out of 10)
0	0
0 < 5	2
5 < 10	4
10 < 20	6
20 < 60	8
60 < 100	10

If, at the end of the course, this grading scheme appears to be unreasonably punitive at the lower end of the distribution (i.e., if the entire class puts forth an outstanding effort on Peerwise, and it is difficult to differentiate amongst students), I may adjust participation scores upwards.

5.3 MAKEUP EXAM DATES / LOCATIONS

You must have a valid medical or compassionate reason for missing a scheduled evaluation, and documentation for your absence must be filed with the main office of the School of Health Studies. See section 7.2 of this outline for information concerning acceptable documentation of illness.

Retroactive exam accommodation (i.e., for exams that have been written) will not generally be granted.

Makeup examinations will consist of some combination of multiple choice questions, essay questions, and computational questions. **Makeup examinations are scheduled by the School of Health Studies. You will be given information as to the date, time, and location of the makeup examination after you have been granted permission to write the examination. NOTE: There is no second makeup examination for either of the midterms in this course. If you are unable to write a makeup examination as scheduled by the School (for any reason) the value of that exam will shifted to the final examination.**

6.0 LECTURE / LAB SCHEDULE

	Lecture Topics	Online Quiz Due
2021.01.11	Describing Data	2021.01.20
2021.01.18	Hypothesis Testing	2021.01.27
2021.01.25	Single Sample Inference	2021.02.03
2021.02.01	Independent Groups t-test	2021.02.10
2021.02.08	Dependent Groups t-test	2021.02.24
2021.02.15	<i>No class – Reading Week</i>	
2021.02.22	Correlation & Regression	2021.03.03
2021.03.01	<i>No content this week – midterm on 2021.03.05</i>	
2021.03.08	Univariate Count Data	2021.03.17
2021.03.15	Bivariate Count Data	
2021.03.22	ANOVA, Independent Groups	
2021.03.29	ANOVA, Dependent Groups	
2021.04.05	Pairwise Comparisons	

7.1 GENERAL COURSE NOTES

Student Code of Conduct

You are expected to comply with the Code of Student Conduct at all times when dealing with classmates and members of the instructional team. The purpose of this Code is to define the general standard of conduct expected of students registered at The University of Western Ontario, 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 <http://www.uwo.ca/univsec/pdf/board/code.pdf>.

Course Website

This course is “paperless” and as such OWL (and links on OWL) will be your sole source for lecture materials, readings, and course information (including this course outline). Due to privacy regulations,

grades will only be provided to you through OWL – I will not, under any circumstance, convey grades via email or over the phone.

Email

I am happy to answer your questions via email. You must, however, use your UWO email address for all correspondence regarding this course. Because the University ‘anti-spam’ programs often reject email from Gmail, iCloud, Hotmail, Yahoo, and other public email addresses, there is no guarantee that I will receive your emails if you send them from a public email program – or from any off-campus server, when sending email using any method other than the university’s webmail system. That said, I will do my best to answer your emails promptly.

Grade Adjustments

Final grades in this course will be taken to the closest integer (i.e., I will “round off” decimals). Exam grades will be calculated out of 100% to one decimal place. I will not, under any circumstances, “bump up” your grade (i.e., to facilitate professional school applications etc.). This includes grades that end in a “9”. Along similar lines, I will not reweight examinations for reasons other than those outlined in section 5.3. In other words – I will not alter exam weights for evaluations that you have already written.

Use of Recording Devices and Course Content

Course instructors own and retain the intellectual property rights to their teaching materials. These rights extend to materials used in online settings and digital learning management systems like OWL. Additionally, some of the materials used within this course (e.g., the textbook) have license restrictions that limit the ways in which they may be shared and used outside the course. You do not have my permission to make audio or video recordings of lectures, take pictures of lecture material, or distribute any of the teaching materials within the course. **Unless explicitly noted otherwise, you may not edit, re-use, distribute, or re-broadcast any of the material posted to (or linked within) the course website.**

7.2 POLICY REGARDING ILLNESS

The University recognizes that a student’s ability to meet their academic responsibilities may, on occasion, be impaired by extenuating circumstances, including short-term illness or injury. Reasonable academic consideration is a cooperative process between the University, the student, and academic staff. All participants in the process must act in good faith, and fulfil their respective obligations, if it is to succeed.

Students who experience an extenuating circumstance (illness, injury, or other extenuating circumstance) sufficiently significant as to temporarily render them unable to meet academic requirements, may submit a request for academic consideration through the following routes:

- Submitting a Self-Reported Absence form, provided that the conditions for submission are met;
- For medical absences, submitting a Student Medical Certificate (SMC) signed by a licensed medical or mental health practitioner, in order to be eligible for Academic Consideration; or
- For non-medical absences, submitting appropriate documentation (e.g., obituary, police report, accident report, court order, etc.) to Academic Counselling in their Faculty of registration, in order to be eligible for academic consideration.

Students seeking academic consideration:

- Are advised to consider carefully the implications of postponing tests or midterm exams or delaying handing in work;
- Are encouraged to make appropriate decisions, based on their specific circumstances, recognizing that minor ailments (e.g., upset stomach) or upsets (e.g., argument with a friend) are not normally an appropriate basis for a self-reported absence;
- Must communicate with their instructors no later than 24 hours after the end of the period covered by either the self-reported absence or SMC, or immediately upon their return following a documented absence;
- Are advised that all necessary documentation, forms, etc. are to be submitted to academic counselling within two business days after the date specified for resuming responsibilities

Students who experience an unexpected illness or injury or an extenuating circumstance (48 hours or less) that is sufficiently severe as to temporarily render them unable to meet academic requirements (e.g., attending lectures or labs, writing tests or midterm exams, completing and submitting assignments, participating in presentations) should self-declare using the online Self-Reported Absence portal. This option should be used in situations where the student expects to resume academic responsibilities within 48 hours or less. The following conditions are in place for self-reporting of medical or extenuating circumstances:

- a. Students will be allowed a maximum of two self-reported absences between September and April, and one self-reported absence between May and August;
- b. The duration of the excused absence will be for a maximum of 48 hours from the time the Self-Reported Absence form is completed through the online portal, or from 8:30am the following morning if the form is submitted after 4:30pm;
- c. The duration of the excused absence will terminate prior to the end of the 48 hour period, should the student undertake significant academic responsibilities (e.g., write a test, submit a paper) during that time;
- d. The duration of an excused absence will terminate at 8:30am on the day following the last day of classes each semester, regardless of how many days of absence have elapsed;
- e. Self-reported absences will not be allowed for scheduled final examinations; for midterm examinations scheduled during the December examination period; or for final lab examinations (i.e., “bellringers”);
- f. Self-reporting may not be used for assessments (e.g., midterm exams, tests, reports, presentations, or essays) worth more than 30% of any given course;
- g. Students must be in touch with their instructors no later than 24 hours after the end of the period covered by the Self-Reported Absence form, to clarify how they will be expected to fulfil the academic expectations they may have missed

7.3 POLICY ON CHEATING & ACADEMIC MISCONDUCT

Scholastic offences are taken seriously and you are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

7.4 HEALTH AND WELLNESS

As part of a successful undergraduate experience at Western, we encourage you to make your health and wellness a priority. Further information regarding health and wellness-related services available to students may be found at <http://www.health.uwo.ca/>. If you are in emotional or mental distress, please refer to Mental Health@Western (<http://www.uwo.ca/uwocom/mentalhealth/>) for a complete list of options about how to obtain help. To help you learn more about mental health, Western has developed an interactive mental health learning module, found here:

https://www.uwo.ca/health/staff_fac/mental_wellbeing/education/module.html.

7.5 SUPPORT SERVICES

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

- Student Development Centre -- <http://www.sdc.uwo.ca/ssd/>
- Student Health -- <http://www.shs.uwo.ca/student/studenthealthservices.html>
- Registrar's Office -- <http://www.registrar.uwo.ca/>
- Ombudsperson's Office -- <http://www.uwo.ca/ombuds/>

8.0 PROCEDURES FOR APPEALING ACADEMIC EVALUATIONS

In the first instance, all appeals of a grade must be made to the course instructor (informal consultation). If you are not satisfied with the decision of the course instructor, a written appeal must be sent to the Undergraduate Chair of the School of Health Studies. If you consider this response to be unsatisfactory, you may then appeal to the Associate Dean (Undergraduate) of the Faculty of Health Sciences. If this response is unsatisfactory, you may appeal to the Senate Review Board Academic. A Guide to Appeals is available from the Ombudsperson's Office.

The university-wide descriptor of the meaning of letter grades, as approved by Senate:

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

It is expected that the grades for this course will fall between 72 and 76. In the event that the course average falls outside this range, a constant may be added to (or subtracted from) each student's grade, by the instructor, to bring the class average in line with school policy.