

Optional Course Materials

You may also find the textbook from Psychology 2850AB useful, but it is not required, Gravetter, Wallnau, Forzano & Witnauer (2021). Essentials of statistics for the behavioral sciences (10th ed.). Boston, MA: Cengage Learning

Learning Outcomes

By the end of the course, students will be able to:

1. Determine what statistical analysis is appropriate for a set of research data;
2. Calculate and correctly interpret confidence intervals;
3. Perform appropriate statistical analyses for a variety of data sets including *t*-tests, analysis of variance, correlation, regression and non-parametric tests;
4. Be able to correctly interpret the results of statistics tests including *t*-tests, analysis of variance, correlation, regression and non-parametric tests to support conclusions based on the research design, type of data and statistic used;
5. Appropriately report the results of the various statistics tests covered in the course.

Brescia Competencies

1. *Critical Thinking (level 3)*: being able to critically evaluate and interpret scientific evidence as part of hypothesis testing is an important aspect of Critical Thinking and at its core, that is exactly why we use statistics;
2. *Inquiry and Analysis (level 3)*: one of the skills that you will develop in statistics is the ability to break down a complex problem or research question into testable components and to be able to assess, quantitatively, the relationships among events;
3. *Problem Solving (level 3)*: At its core, statistics in the behaviour sciences are used as a tool in Problem Solving.
4. *Self Awareness and Development*; learning about the structure and function of personality contributes to our self-knowledge, and that knowledge will be demonstrated by applying course content knowledge to examples from your own experience (level 3).
5. *Communication*: Applications of course concepts to your own experience (Applications) and participation in online discussions and forums provide opportunities to practice communication skills (level 2).

Teaching Methodology and Expectations of Students

This year we are changing the way we do statistics in Psych 2851B. In the past, students did the calculations using only a calculator and as a result a great deal of time was spent working through formulae and doing calculations. This year, we introduce the use of the software package Jamovi. Few if any researchers calculate statistical tests using only a calculator; everyone uses a software package such as SPSS, Jamovi, or JASP.

In consultation with other faculty members in Brescia Psychology, I chose Jamovi for 2851B. Jamovi is *very* easy to use and is a free download. With time freed from performing lengthy calculations by hand, we can direct more attention to understanding and interpreting the results of statistical tests, and that is the most important aspect of doing statistics.

It is important that you keep up with the course outline. It is also important that you do the assignments: **The only way to learn about statistics is to do statistics.**

Computer: You need a computer to use Jamovi. System requirements are modest so Jamovi should run on any laptop or desktop, whether Windows, Mac OS, Linux, or Chromebook. You will find it most effective if you have a computer with you so you can follow along with Jamovi demonstrations.

Copyright and Intellectual Property

PowerPoint lecture slides and notes, online activities, assignments and assignment guidelines, and other components of the course materials are the intellectual property of the instructor. Unauthorized reproduction, sharing on social media, or posting on course-sharing websites is an infringement of copyright and is prohibited. Such action may be considered a Student Code of Conduct violation and lead to sanctions.

Evaluation

Tests and Examinations

This course divides naturally into three sections: the t Statistic, Analysis of Variance, Correlation and Regression. There will be a test for each of the three sections.

Test 1, the t -test: Scheduled for Tuesday February 7. Test 1 will be written during out scheduled class time, but in room UH 250, not in our usual room. Test 1 will cover hypothesis testing with the t -test, material from Chapters 9 and 11 from Navarro and Foxcroft, (2019), and the corresponding classes. Test 1 contributes 25% to your final course mark.

Test 2, Analysis of Variance: Scheduled for Tuesday March 7. Test 2 will be written during out scheduled class time, but in room UH 250, not in our usual room. Test 2 will cover the Analysis of Variance (ANOVA). This is material from Chapters 13 and 14 from Navarro and Foxcroft, (2019), and the corresponding classes. Test 2 contributes 25% to your final course mark.

Test 3/Final Examination, Confidence Intervals, Correlation and Regression, Chi-Square: although a final examination because it is held during the final examination period, this is really a third test. Test 3/Final Exam will be based on Chapters 10 and 12 Navarro and Foxcroft, (2019), and the corresponding classes. Date of Test 3/Final Exam will be determined by the Final Examination schedule. Test 3/Final Exam contributes 25% to your final course mark.

The tests and final exam will have questions in different formats. You will not have to calculate statistical terms. For some questions you will be provided with Jamovi output and be asked to answer questions based on that output as both multiple choice and short answer questions.

Assignments

Twenty percent (20%) of your mark comes from a series of short assignments. There are **five** assignments, and you need to submit **four** out of the five. It is your choice which four you submit. If you submit all five, the marks from your best four will be used to calculate your total assignment mark. Assignments are marked out of 20 or 25, but all contribute the same to your final course grade. Whether marked out of 20 or 25, each assignment is worth 5% of your course mark.

Assignments will usually involve working out a statistical problem (including your Jamovi output) and providing a concise written interpretation and/or graphic presentation of the results of the analysis. Detailed instructions will accompany the assignments. Assignments are due by 6:00 pm on the due date.

Late Assignments: There is a per day penalty for assignments submitted late. The late is penalty is 1 mark out of 5 per day late, excluding weekends. Assignments submitted after 6:00 pm on the due date will be considered late and the late penalty will be applied. Assignments that are 4 or more days late will not be marked and will be given a grade of 0.

	Topic	Due
1	Hypothesis Tests and the One Sample <i>t</i> -test	Jan. 23
2	Independent Samples <i>t</i> -test	Feb. 3
3	ANOVA	Feb. 17
4	Confidence Intervals	Mar. 17
5	Correlation and Regression	Mar. 31

Attendance

It is important that you attend class. Attendance is worth 5% of your course mark. There may be circumstances that prevent attendance at one or two classes, so occasional absences are understandable. However, missing more than three classes without valid academic accommodation will result in a loss of ½ attendance mark (out of 5) for each class missed.

Evaluation Breakdown:

Component	Weight	Date/ Deadline	Learning Outcome	Brescia Competencies
Attendance	5%	Ongoing	Impacts all	4
Assignments (4 x 5%)	20%	See above	1, 3, 4, 5	1, 2, 3
Test 1	25%	Feb. 7	1, 2, 3, 4, 5	1, 2, 3, 5
Test 2	25%	Mar. 7	1, 2, 3, 4, 5	1, 2, 3, 5
Test 3/Final Exam	25%	TBA	1, 2, 3, 4, 5	1, 2, 3, 5

Academic Accommodation

For course components worth 10% or more of the total course grade, please see the Academic Policies and Regulations section at the end of this course outline, see you Academic Advisor, or consult the Academic Calendar.

For attendance, missing more than three classes without valid academic accommodation will result in a loss of ½ attendance mark (out of 5) for each class missed.

Whenever possible students should provide notification in advance of due dates or absence. According to Western academic regulations, if advance notification is not possible, the course instructor should be contacted within two business days.

Course Content

Note:

Readings are from *Learning Statistics with Jamovi* by Navarro and Foxcroft (2019).

Chapters from Gravetter et al., (2021) are given as an additional source of explanations and practice questions. You are **not** responsible for the chapters from Gravetter et al., (2021) but you may find them helpful.

Date	Description	Navarro & Foxcroft ¹	Gravetter et al. ²
Jan. 10	Opening Class, Review of Hypothesis Testing	9	
12, 17	Review of Hypothesis Testing, Introduction to Jamovi	9 3	
17, 19	The One Sample <i>t</i> -test	11	10, 11
24, 26, 31	Comparing Two Means: the <i>t</i> -test	11	10, 11
Feb. 2	Comparing Multiple Means: One-way ANOVA	13	12
7	<i>Test 1: Room UH 250</i>		
9	Comparing Multiple Means: One-way ANOVA	13	12
14, 16	Comparing Multiple Means: Repeated Measures ANOVA	13	13
<i>February 20 – 24, Winter Reading Week</i>			
28	Comparing Multiple Means: Factorial ANOVA	14	14
Mar. 2	Comparing Multiple Means: Factorial ANOVA	14	14
7	<i>Test 2: Room UH 250</i>		
9, 14	Confidence Intervals	8.5	308-311
16, 21	Correlation	12	15
23, 28	Regression	12	16
30	Chi-square and Non-parametric Statistics	10	17
Apr. 4	Chi-square and Non-parametric Statistics	10	17
6	Last Class		

¹ Chapter from Navarro and Foxcroft, 2019

² Chapter from Gravetter, Wallnau, Forzano & Witnauer, 2021, given as an additional source of explanations and practice questions.

2022-23 BRESCIA UNIVERSITY COLLEGE ACADEMIC POLICIES AND REGULATIONS

1. POLICY REGARDING ACADEMIC ACCOMMODATION

The complete policy regarding Accommodation for Illness - Undergraduate Students can be found at

https://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_135

Students who have long-term or chronic medical conditions which may impede their ability to complete academic responsibilities should seek Academic Accommodation through Student Accessibility Services

(https://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_10).

Personal commitments (e.g., vacation flight bookings, work schedule) which conflict with a scheduled test, exam or course requirement are **not** grounds for academic accommodation.

Students who experience an illness or extenuating circumstance sufficiently severe to temporarily render them unable to meet academic requirements may submit a request for academic consideration through the following routes:

1. For medical absences, submitting a **Student Medical Certificate (SMC)** signed by a licensed medical or mental health practitioner;
2. For non-medical absences, submitting **appropriate documentation** (e.g., obituary, police report, accident report, court order, etc.) to their Academic Advisor. Students are encouraged to contact their Academic Advisor to clarify what documentation is acceptable.

Request for Academic Consideration for a Medical Absence

When a student requests academic accommodation (e.g., extension of a deadline, a makeup exam) for work representing 10% or more of the student's overall grade in the course, it is the responsibility of the student to provide acceptable documentation to support a medical or compassionate claim. All such requests for academic accommodation **must** be made through an Academic Advisor and include supporting documentation.

Academic accommodation for illness will be granted only if 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. Minor ailments typically treated by over-the-counter medications will not normally be accommodated.

The following conditions apply for students seeking academic accommodation on medical grounds:

1. Students must submit their Student Medical Certificate (SMC) along with a request for relief specifying the nature of the accommodation being requested no later than two business days after the date specified for resuming responsibilities. An SMC can be downloaded from https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf;
2. In cases where there might be an extended absence or serious issue, students should submit their documentation promptly and consult their Academic Advisor for advice during their recovery period;

3. Whenever possible, students who require academic accommodation should provide notification and documentation in advance of due dates, scheduled tests or examinations, and other academic requirements;
4. Students **must** communicate with their instructors **no later than 24 hours** after the end of the period covered by the SMC to clarify how they will fulfil the academic expectations they may have missed during the absence;
5. Appropriate academic accommodation will be determined by the Dean's Office/Academic Advisor in consultation with the course instructor(s). Academic accommodation may include extension of deadlines, waiver of attendance requirements, arranging Special Exams (make-ups), re-weighting course requirements, or granting late withdrawal without academic penalty.

2. ACADEMIC CONCERNS

If you feel that you have a medical or personal challenge that is interfering with your work, contact your instructor and Academic Advisor as soon as possible. Problems may then be documented and possible arrangements to assist you can be discussed at the time of occurrence rather than on a retroactive basis. Retroactive requests for academic accommodation on medical or compassionate grounds are not normally considered.

If you think that you are too far behind to catch up or that your work load is not manageable, you should consult your Academic Advisor

(https://brescia.uwo.ca/enrolment_services/academic_advising/book_an_appointment.php). If you consider reducing your workload by dropping one or more courses, this must be done by the appropriate deadlines; please contact your Academic Advisor or see the list of sessional dates in the Academic Calendar

(<https://www.westerncalendar.uwo.ca/SessionalDates.cfm?SelectedCalendar=Live&ArchiveID=>).

You should consult with the course instructor and the Academic Advisor who can help you consider alternatives to dropping one or more courses. *Note that dropping a course may affect OSAP eligibility and/or Entrance Scholarship eligibility.*

3. ABSENCES

Short Absences: If you miss a class due to a minor illness or other problems, check your course outline for information regarding attendance requirements and make sure you are not missing a test or assignment. Cover any readings and arrange to borrow notes from a classmate. Contact the course instructor if you have any questions.

Please note that for asynchronous online courses, attendance or participation requirements maybe different than for synchronous or in-person courses.

Extended Absences: If you have an extended absence, you should contact the course instructor and an Academic Advisor. Your course instructor and Academic Advisor can discuss ways for you to catch up on missed work, and arrange academic accommodations if appropriate and warranted.

It is important to note that the Academic Dean may refuse permission to write the final examination in a course if the student has failed to maintain satisfactory academic standing throughout the year or for too frequent absence from the class or laboratory (https://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=5&SelectedCalendar=Live&ArchiveID=#Page_64).

4. SCHOLASTIC 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: https://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_20.

Students are responsible for understanding the nature of and avoiding the occurrence of plagiarism and other academic offences. Note that such offences include plagiarism, cheating on an examination, submitting false or fraudulent assignments or credentials, impersonating a candidate, or submitting for credit in any course without the knowledge and approval of the instructor to whom it is submitted, any academic work for which credit has previously been obtained or is being sought in another course in the University or elsewhere. Students are advised to consult the section on Scholastic Discipline for Undergraduate Students in the Academic Calendar.

If you are in doubt about whether what you are doing is inappropriate or not, consult your instructor, the Academic Dean's Office, or the Registrar. A claim that "you didn't know it was wrong" is not accepted as an excuse.

The penalties for a student guilty of a scholastic offence (including plagiarism) include refusal of a passing grade in the assignment, refusal of a passing grade in the course, suspension from the University, and expulsion from the University.

Plagiarism:

Students must write their essays and assignments in their own words. Whenever students take an idea or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence.

All required 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 for such checking 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 The University of Western Ontario and Turnitin.com.

Computer-marked Tests/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. Software currently in use to score computer-marked multiple-choice tests and exams performs a similarity review as part of standard exam analysis.

5. PROCEDURES FOR APPEALING ACADEMIC EVALUATIONS

All appeals of a grade must be directed first to the course instructor. If the student is not satisfied with the decision of the course instructor, a written appeal is to be sent to the School Chair. If the response of the Chair is considered unsatisfactory to the student, they may then submit a written appeal to the Office of the Dean. If the student is not satisfied with the decision of the Dean, they may appeal to the Senate Review Board Academic (SRBA), if there are sufficient grounds for the appeal and if the matter falls within the jurisdiction of the SRBA. For information on academic appeals consult your Academic Advisor or see the Student Academic Appeals – Undergraduate in the Academic Calendar https://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_14.

Note that final course marks are not official until the Academic Dean has reviewed and signed the final grade report for the course. If course marks deviate from acceptable and appropriate standards, the Academic Dean may require grades to be adjusted to align them with accepted grading practices.

6. PREREQUISITES

Unless you have either the prerequisites for a course or written Special Permission from the Dean to enroll in it, you will be removed from the 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 prerequisite(s).

7. SUPPORT

Support Services

The Brescia University College Registrar's website, with a link to Academic Advisors, is at <http://brescia.uwo.ca/academics/registrar-services/>. Students can access supports through Brescia's Student Life Centre (<http://brescia.uwo.ca/life/student-life/>) and Learning Development & Success at Western (<https://www.uwo.ca/sdc/learning/>).

Mental Health and Wellness

Students may experience a range of issues that can cause barriers to your learning, such as increased anxiety, feeling overwhelmed, feeling down or lost, difficulty concentrating and/or lack of motivation. Services are available to assist you with addressing these and other concerns you may be experiencing. You can obtain information about how to obtain help for yourself or others through **Health & Wellness at Brescia**, https://brescia.uwo.ca/student_life/health_and_wellness/index.php and **Health and Wellness at Western**, http://uwo.ca/health/mental_wellbeing/index.html.

Sexual Violence

All members of the Brescia University College community have a right to work and study in an environment that is free from any form of sexual violence. Brescia University College recognizes that the prevention of, and response to, Sexual Violence is of particular importance in the university environment. Sexual Violence is strictly prohibited and unacceptable and will not be tolerated. Brescia is committed to preventing Sexual Violence and creating a safe space for anyone in the Brescia community who has experienced Sexual Violence.

If you or someone you know has experienced any form of Sexual Violence, you may access resources at https://brescia.uwo.ca/safe_campus/sexual_violence/index.php.