

**MOS 2242B, Section 530
STATISTICS**

Contact	Office Hours	Class Time & Location
Laura Johnson ljohn47@uwo.ca	By appointment (on Zoom)	Wednesdays @ 2:30 – 5:30 PM EST BR-302

COURSE DESCRIPTION

The purpose of this course is to introduce students to quantitative decision-making skills, with an emphasis on analysis techniques used in management. Topics include: descriptive statistics, probability, hypothesis testing, analysis of variance, correlation and regression, time series forecasting, and survey techniques.

Extra Information: 3 lecture hours.

PREREQUISITES AND ANTIREQUITES

Antirequisite(s): Biology 2244A/B, Economics 2122A/B, Economics 2222A/B, Geography 2210A/B, Health Sciences 3801A/B, Psychology 2811A/B, the former Psychology 2810, the former 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.

Prerequisite(s): 1.0 course or equivalent from Calculus 1000A/B, Calculus 1301A/B, Calculus 1501A/B; Mathematics 1225A/B, Mathematics 1228A/B, Mathematics 1229A/B, and enrolment in a MOS Honours Specialization, Specialization or Major module.

COURSE STRUCTURE AND LEARNING OUTCOMES

Course Structure

A session learning plan for this course is included at the end of this document. Following this schedule is your responsibility. You can expect to spend approximately 5-6 hours per week on this course. On average you might spend:

- 2-3 hours completing preparatory work (readings, statistics problems, etc.)
- 3 hours attending class

Depending on how much effort you put in and how fast you read, these times will vary by individual.

Course Learning Outcomes

Upon successful completion of this course students will be able to:

1. Understand and interpret various descriptive statistics, both visually and numerically, including central tendency, dispersion, and probability distributions
2. Identify and distinguish between various sampling methods and types of data
3. Conduct a hypothesis test and determine the difference between a one-tailed test and two-tailed test for when the population standard deviation is known and when it is unknown
4. List the statistics that appear in an ANOVA and a regression results table, and understand how they are computed
5. Define when a time series represents a trend, a seasonal pattern, or a cyclical pattern, or is irregular
6. Compute the degrees of freedom and examine the significance of the chi-square test statistic

Student competency levels on these outcomes will vary. You can expect to achieve these outcomes if you honour course policies and complete all learning activities in good faith and on time, demonstrate comprehension of the course content, and meet all other course expectations of you as a student.

BRESCIA UNIVERSITY COLLEGE COMPETENCIES

Primary competencies developed in this course include:

Number	Competency	Level
1	Problem Solving	2
2	Inquiry & Analysis	2
3	Critical Thinking	2
4	Communication	1

See <http://brescia.uwo.ca/academics/brescia-competencies/> for a detailed description of each competency.

COURSE MATERIALS

The following textbook is *required*:

Black, K., Bayley, T., & Castillo, I. (2002). *Business statistics for contemporary decision-making* (3rd Canadian edition). Toronto, ON: Wiley. [ISBN: 9781119658221]

The textbook cited is available as in both physical or electronic versions through The Book Store at Western. The textbook is bundled with access to the WileyPLUS online portal that provides you with additional online content, which you may find helpful as you navigate the various units of the course. Access to WileyPLUS is *optional* in this course.

COURSE EVALUATION

Component	Timing	Learning Outcomes	Brescia Competencies	Weight
Exam 1	February 1 (during class)	1, 2	1,2,3,4	33%
Exam 2	March 8 (during class)	3, 4	1,2,3,4	33%
Exam 3	During the final exam period (April 13th - 30th)	5, 6	1,2,3,4	34%

Evaluation Policies

Students are responsible for material covered in the lectures as well as the assigned chapters/sections in the text. Exams will not be returned to students but may be reviewed by contacting your Instructor.

Fairness requires that all students be treated equally and be evaluated using the criteria set out in this course outline. Once you have completed an assignment or exam, you are committed to the mark earned. Your mark in the course will be the mark that you earn based on your demonstrating understanding of course content. The evaluation criteria are based on actual achievement and not on how hard a student has tried. Claims by students of an excellent academic history, good attendance record, need to obtain or maintain a scholarship, desire to be admitted to Ivey or graduate school, or other personal issues, cannot be used to justify a higher grade in the course or a reweighting of course components.

Grades will not be adjusted on the basis of need. It is important to monitor your performance in the course. Remember: You are responsible for your grades in this course. There is no extra work or assignments available for extra credit or to “make up” for a course component that was missed or performed poorly.

EVALUATION COMPONENT DESCRIPTIONS

Exams

Exams will be a combination of multiple choice, short answer, and statistics problems. Each exam will be scheduled for 2.5 hours and will be a **closed-book examinations**. A formula sheet and booklet of necessary statistical tables will be provided by the Instructor for reference during exams.

Please also note that while exams are non-cumulative, some concepts from earlier parts of the course will remain relevant in later components of the course.

Exam Policies

- Bring student identification to exams
- Do not wear baseball caps to exams
- Do not bring laptops, cell phones, music players, beepers, or other electronic devices to exams
- Nothing is to be on/at your desk during an exam except a pencil, an eraser, your student card, and a non-programmable calculator

Calculators

Only non-programmable calculators will be allowed into the exams. If you are unsure, please ask your professor. Electronic devices of any kind (including cell phones, smart watches and calculators) are **NOT** permitted at exams.

COURSE POLICIES

Teaching Methodology and Expectations of Students

Students are expected to complete the preparatory work *before* they attend class where it will be discussed. Each class session may include a combination of mini-lectures, practice questions, and active learning activities (individual and team).

Attendance

It is expected that students will attend all classes. It is in your best interests to be present for lectures. Material covered in lectures will not always be the same as material covered in the textbook. These two sources should be viewed as complimentary and not redundant. As such, students who want to do well in this course are strongly encouraged to attend lectures on a regular basis. Please note that the Instructor will not be providing copies of lecture notes. Therefore, if you miss a lecture, you should try to obtain this material from another student.

Respect

Please act respectfully towards the classroom, the Instructor and your fellow students. Acting respectfully means arriving on time, turning off phones, avoiding private discussions during lectures, refraining from viewing non-course material on your laptops, and cleaning up after yourself. Acting respectfully provides a better learning experience for everyone.

Private in-class discussions are distracting to students and the Instructor. If other students are distracting your attention from the material, you should ask them to be quiet. If you feel uncomfortable doing this (or the problem persists), please see the Instructor.

Late arrivals are also distracting. Please try to arrive on time for classes.

Student Use of Technology in Class

Electronic devices (laptops, tablets, and/or smart phones) may be used for taking notes or for participating in class activities. Please refrain from non-class activities (e.g., texting, checking email, checking social media pages) during class time.

No Recording of Classes

Recording devices of any kind (camera, recorders, phones, etc.) may not be operated without my consent.

Copyright Notice

Lectures and course materials, including power point presentations, outlines, and similar materials, are protected by copyright. You may take notes and make copies of course materials for your own educational use. You may **not** record lectures, reproduce (or allow others to reproduce), post or distribute lecture notes, wiki material, and other course materials publicly and/or for commercial purposes without my written consent.

Preferred Method of Contact

If you have questions about the course content or an activity or assignment, please check OWL Forums to see whether your question has been answered. If you cannot find the information you need, please post your question on OWL Forums.

If you would like to discuss something personal, please contact me through email. I check email and OWL daily Monday through Friday in the evening and early morning. **I generally do not check OWL or my email during the weekend, so plan accordingly.**

EMAIL POLICIES

The following policies apply to all emails between students and the Instructor. Please respect the fact that the Instructor receives many emails from students and must deal with those emails in a fair and organized manner. Unacceptable emails will receive a reply saying only “Please see Email Policies on the course outline”

UWO.CA Email Addresses Only

For privacy reasons, students must use their Western email accounts to contact the Instructor. The Instructor will not respond to emails from non-uwo.ca addresses (e.g., hotmail.com, gmail.com).

Subject Line Must Include Course and Section Number

The subject line of emails must contain the name or number of the course, and the section number in which the student is enrolled. The Instructor receives many emails daily, so this will make it easier to find yours.

Acceptable Emails

- questions about the course content or materials
- asking to set up an appointment to ask questions or review an exam
- notification of illness or other special circumstances
- providing constructive comments or feedback about the course

Unacceptable Emails

- questions that may be answered on OWL or on this course outline
- asking when grades will be posted
- asking what grade a student received
- asking where or when an exam is scheduled or the material covered on an exam
- requests for grade increases, extra assignments, or reweighting of course components

Privacy

To respect privacy laws and the privacy of individual students, all grades will be distributed on OWL only. To respect your privacy, I will discuss your grades only with you. Please do not share or compare your grades. I cannot share information about another student’s grades, so discussions comparing grades between students will not be entertained.

ACADEMIC ACCOMMODATION

If, on medical or compassionate grounds, a student is unable to complete a course component **worth greater than 10 per cent of the final course grade**, it is the responsibility of the student to consult with an Academic Advisor and follow the procedures documented in the “POLICY REGARDING ACADEMIC ACCOMMODATION” on the final pages of this outline.

For academic accommodation to be considered for any course component **worth less than 10 per cent of the final course grade**, it is the responsibility of the student to approach the Instructor in a timely fashion (i.e., within two business days of the missed deadline). Documentation will be required. Medical or other supporting documentation should be submitted to your Academic Advisor.

DROPPING A COURSE

To drop a course without academic penalty, you must drop the course by the following dates:

Winter Term Half Credit Course

March 7, 2023

For further details, check the online academic calendar in the registrar’s website. To book an appointment with one of Brescia’s Academic Advisors, call 519.432.8353, extension 28266. If you are registered at another college or main campus, please make an appointment to see your academic advisor at your home campus.

NOTE REGARDING COVID-19

In the event of a COVID-19 resurgence during the course that necessitates the course moving away from in-person delivery, course content may be delivered online either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). There may also be changes to any remaining assessments at the discretion of the course instructor. In the event of a COVID-19 resurgence, detailed information about the impact on this course will be communicated by the Office of the Provost and by the course instructor.

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 http://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 refer to <http://brescia.uwo.ca/academics/registrar-services/> or the list of official sessional dates in the Academic Calendar (<http://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 may be 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

(http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=5&SelectedCalendar=Live&ArchiveID=#SubHeading_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:

http://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

http://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 Skills Services 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 .

Portions of this document were taken from the Academic Calendar, the Handbook of Academic and Scholarship Policy, and the Academic Handbook of Senate Regulations. This document is a summary of relevant regulations and does not supersede the academic policies and regulations of the Senate of the University of Western Ontario.

Lecture and Examination Schedule

Unit	Date	Unit Topic(s)	Preparatory Work	Textbook Chapters/Sections
PART 1				
1	Jan. 11	Introduction to Statistics	Textbook reading	Chapter 1: 1.1, 1.2, 1.3, 1.5 Chapter 7: 7.1
2	Jan. 18	Describing & Displaying Data	Textbook reading	Chapter 2: 2.1, 2.2, 2.3 Chapter 3: 3.1, 3.2, 3.3, 3.4
3&4	Jan. 25	Random Variables & Probability Distributions (Discrete & Continuous)	Textbook reading	Chapter 4: 4.1, 4.2 Chapter 5: 5.1, 5.2, 5.3 Chapter 6: 6.2, 6.3 Chapter 7: 7.2
--	Feb. 1	Exam 1 – 33% During class time – No lecture		Units 1, 2, 3, 4 tested
PART 2				
5	Feb. 8	Single-Sample Hypothesis Testing	Textbook reading	Chapter 7: 7.3 Chapter 8: 8.1, 8.2, 8.3 Chapter 9: 9.1, 9.2, 9.3, 9.4
6	Feb. 15	Two-Sample Hypothesis Testing	Textbook reading	Chapter 10: 10.1, 10.2, 10.3, 10.5
--	Feb. 22	Spring Reading Week (Feb. 18 to 26) No lectures this week		
7&8	Mar. 1	Analysis of Variance (ANOVA)	Textbook reading	Chapter 11: 11.1, 11.2, 11.3 Chapter 11: 11.4
--	Mar. 8	Exam 2 – 33% During class time – No lecture		Units 4, 6, 7, 8 tested
PART				
9	Mar. 15	Chi-Square Tests for Nominal Data	Textbook reading	Chapter 16: 16.1, 16.2
10	Mar. 22	Correlation & Simple Linear Regression	Textbook reading	Chapter 12: 12.1, 12.2, 12.3, 12.4, 12.5, 12.6, 12.8
11	Mar. 29	Multiple Regression	Textbook reading	Chapter 13: 13.1, 13.2, 13.3, 13.4, 13.5 Chapter 14: 14.3, 14.4
12	Apr. 5	Time Series Forecasting	Textbook reading	Chapter 14: 14.2 Chapter 15: 15.1, 15.3, 15.4
--	April 13-30	Exam 3 – 34% During the final exam period		Units 9, 10, 11, 12 tested