



**Department of Biology  
and  
Department of Statistical & Actuarial Sciences  
Biology/Statistics 2244B – “Statistics for Science”**

**Course outline for Winter 2024 (term 1239)**



Western University is committed to a **thriving campus**. We encourage you to check out the [Your Student Experience](#) website to manage your academics and well-being. Additionally, the following link provides available resources to support students on and off campus: <https://www.uwo.ca/health/>. Students who are in emotional/mental distress should refer to Mental Health@Western (<http://uwo.ca/health/>) for a complete list of options about how to obtain help.

## Course Information

---

### **Biology/Statistics 2244AB, sections 200 & 201, FW23**

An introductory course in the application of statistical methods, intended for honours students in departments other than Statistical and Actuarial Sciences, Applied Mathematics, Mathematics, or students in the Faculty of Engineering. Topics include sampling, confidence intervals, analysis of variance, regression and correlation. Cannot be taken for credit in any module in Statistics, Actuarial Science, or Financial Modelling other than in Applied Statistics.

### **List of Prerequisite(s)**

1.0 mathematics course, or equivalent numbered 1000 or above. Data Science 1000A/B or the former Statistical Sciences 1024A/B or Integrated Science 1001X can be used to meet 0.5 of the 1.0 mathematics course requirement.

### **List of Antirequisite(s)**

All other courses in Introductory Statistics (except Statistical Sciences 1023A/B, Data Science 1000A/B, or the former Statistical Sciences 1024A/B): Economics 2122A/B, Economics 2222A/B, Geography 2210A/B, Health Sciences 3801A/B, MOS 2242A/B, Psychology 2811A/B or the former Psychology 2810, Psychology 2801F/G or 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 2858A/B.

*Unless you have either the requisites for this course or written special permission from your Dean's Designate (Department/Program Counsellors and Science Academic Counselling) 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.*

## Important Dates



Classes Start	Add deadline	Spring Reading Week	Drop Deadline*	Classes End	Exam Period
Jan 8	Jan 16	Feb 17-25	March 7	Apr 8	Apr 11-30

\*Last day to withdraw from a second-term half course or a second-term full course without academic penalty.

## Instructor Information



### Course Instructor

Jennifer Peter (she/her)

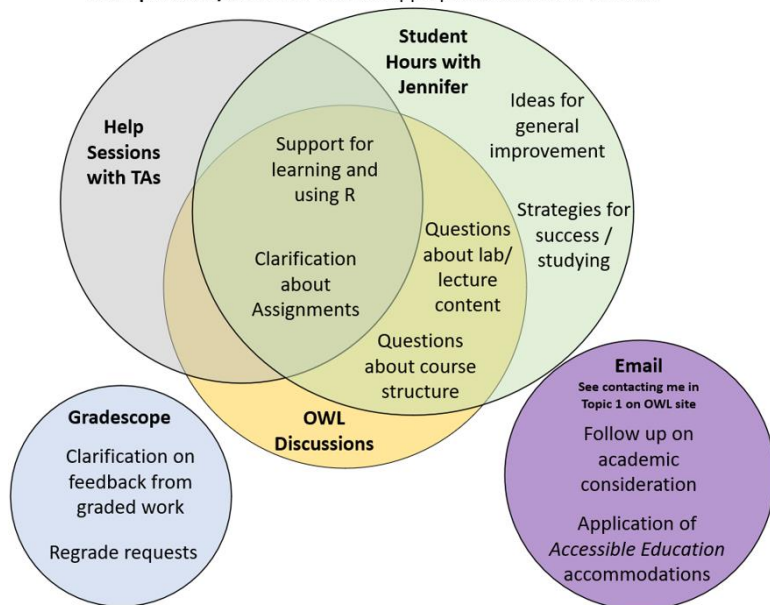
### Contact Information

Email is used in a **VERY restricted and limited manner in 2244**. Email should only be used for discussions about academic consideration and accommodations. All other types of questions should use a method as described in the picture to the right. **Emails MUST have "2244B"** at the **start** of the subject line or they will not receive a response.

### Response time:

At busy times, I 'triage' questions; for example, I will prioritize answering questions that relate to assignments with upcoming deadlines, and delay—if necessary—responses to requests that are not as time sensitive (based on my experience). For efficiency, I also use class-wide or group announcements to reply when deemed appropriate. So, please be patient with my response time, and watch for a response that could either be direct or via a larger (albeit, confidential) group response.

Have questions/concerns? Use the appropriate method of contact!



Timing of **Student Hours with Jennifer** (weekly drop-in times to get support and ask questions), and **Help Sessions with TAs** (to get clarification on assignments and troubleshooting with lab content) will be organized during the first week of the course, based on polling of student availability. These may be in-person and/or over Zoom.

### Methods of communication

To ensure your questions/concerns are addressed properly, please note the following:

- Regrade requests **MUST** be sent **through Gradescope within one week** after grading is returned; such requests sent through any other means will **NOT** be addressed; this is an efficiency and organizational choice.
- Questions about course content should be made on the OWL Discussions, during scheduled Student Hours, and/or during lectures.

## Course Schedule and Delivery Mode

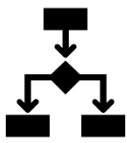
---

### Universal Design for Learning

# UDL

This course has been designed to apply principles of **Universal Design for Learning (UDL)**, which “focuses on eliminating barriers through initial designs that consider the needs of diverse people”<sup>1</sup>. You will encounter in-person, audio, video, and/or text-based versions of lecture and lab content (including closed-captioning during in-person classes), diagnostic assessments (“What do you know?”) and “self-assessments” to help you efficiently allocate your time for learning, deadlines with automatic grace periods, and alternative course grading schemes that recognize that mastery occurs at different rates.

### Delivery of course material



This course is timetabled as a [blended course](#); this means that the course content is a mixture (blend!) of online and in-person delivery. Specific to Biol/Stat 2244, *lecture content* is focused on in-person delivery, while *lab* content is delivered online. Therefore, having a reliable internet connection, and, ideally, dedicated access to a laptop or desktop computer is required to be successful.

**Contingency planning.** Although the intent is for this course to be delivered in-person (as described above), should any university-declared emergency require some or all of the course to be delivered online, either synchronously or asynchronously, the course will be adapted accordingly. The grading scheme will **not** change. Any assessments affected will be conducted online as determined by the course instructor.

### Timetable

#### Lectures

There are two lecture sections for the course. For dates/times and locations of lectures, see the OWL Brightspace course site

I will attempt to keep the two lecture sections moving at the same pace; however, the sections do get misaligned occasionally (e.g. by about 5 min) as a result of differences in questions and discussion.

#### Labs

There is a lab component to the course, however, it is online and asynchronous. You should plan to have one to two hours of lab content to cover most weeks, plus allocate time for suggested practice (which will prepare you for the use of the lab content on assessments). There will be weekly Help Sessions with TAs that you can drop in to get support and ask questions about lab-related skills.

## Learning Outcomes

---

This course is fundamentally organized to **demonstrate that statistics is a scientific discipline that can and should inform research at all stages**, from problem definition through data interpretation and conclusion. To reinforce this over-arching learning outcome, the course topics are organized around a “backbone” based on the PPDAC framework for scientific inquiry<sup>2</sup> and focuses on building knowledge and experience related to questions that researchers should consider at each stage of the research process. These overarching goals are reflected in the course-level learning outcomes on the next page.

---

<sup>1</sup> Novak, K. and T. Thibodeau. 2016. UDL in the Cloud: How to design and deliver online education using Universal Design for Learning. CAST, Inc., Wakefield, Massachusetts.

<sup>2</sup> Mackay, R.J., and R.W. Oldford. 2000. Scientific method, statistical method, and the speed of light. *Statistical Science* 15(3): 254-278.

By the end of the course, a successful student will have demonstrated a majority of following learning outcomes:

Design sampling and study procedures to collect relevant data addressing a research question.	<ul style="list-style-type: none"><li>• Recognize and design common sampling and study design methods.</li><li>• Identify issues associated with sampling and study design (such as bias, undercoverage, confounding, control, reproducibility)</li><li>• Identify potential relevant inference procedures and/or models based on research question, and, type and number of variables.</li></ul>
Create and interpret appropriate summaries of data.	<ul style="list-style-type: none"><li>• Select appropriate summaries based on research question and variables.</li><li>• Interpret common graphical and numerical summaries to identify and/or describe patterns and interesting features in univariate, bivariate, and/or multivariate data.</li></ul>
Analyse data using inference procedures to address a research question.	<ul style="list-style-type: none"><li>• Identify data structure characteristics relevant to selecting appropriate analyses and summaries (e.g. number of comparison groups, type of variables, paired vs. independent samples, etc.)</li><li>• Interpret and describe confidence intervals and P-values.</li><li>• Evaluate model diagnostics for common parametric inference procedures.</li></ul>
Use statistical software to explore, summarize, analyse, interpret, and communicate data in a reproducible manner.	<ul style="list-style-type: none"><li>• Use R to create graphical and numerical summaries of data.</li><li>• Use R to conduct common parametric inference procedures, including model diagnostics.</li><li>• Interpret R (or other statistical software) output including accompanying code.</li><li>• Use R markdown to create reproducible analyses and reports.</li></ul>
Communicate statistical concepts, analyses, and arguments in an accurate, and scholarly manner.	<ul style="list-style-type: none"><li>• Apply vocabulary to describe statistical concepts, procedures, and ideas.</li><li>• Use conventional and transparent formats for reporting results of statistical analyses in written/graphical form.</li><li>• Justify the choice of statistical procedures (e.g. selected study designs) when considering data quality and generalizability.</li></ul>
Describe models and/or conceptual background for common inference procedures.	<ul style="list-style-type: none"><li>• Describe the models for common inference procedures.</li><li>• Describe sampling distributions (based on simple random samples) for commonly used statistics (e.g. means, proportions).</li></ul>

## Course Schedule

Some adjustments to this schedule may be made if issues are encountered during the course; any changes to due dates will be announced on OWL through email to all students and via an Announcement.

Week	Lecture/Lab Topics	Assessments due Fri at 11:55 pm EST (plus 48-h grace period)	Exams
Jan 8–14	Understanding 2244 PPDAC: A scientific inquiry framework		
Jan 15–21	Sampling designs & considerations <b>Lab:</b> Setting up R & R Studio		
Jan 22–28	Sampling designs & considerations, cont'd. Study designs & considerations <b>Lab:</b> Working with Data in R	Activity 1	
Jan 29–Feb 4	Study designs & considerations, cont'd. <b>Lab:</b> Reproducible files using R markdown	Activity 2	
Feb 5–11	Study designs & considerations, cont'd. Data Structure and Planning Analysis	Assignment 1: <i>Problem &amp; Plan</i>	
Feb 12–16	Summarizing & Exploring Data <b>Lab:</b> Summarizing & Visualizing Data in R	Activity 3	
Feb 17–25	<b>Reading Week (no classes)</b>		
Feb 26–Mar 3	Summarizing & Exploring Data, cont'd. Sampling Distributions of Estimators		<b>Midterm:</b> 7-9 pm, Sun. March 3 <sup>rd</sup>
Mar 4–10	Sampling Distributions of Estimators, cont'd. Understanding confidence intervals	Assignment 2: <i>Data</i>	<b>MAKEUP Midterm*:</b> 7-9 pm, Sun. March 10 <sup>th</sup>
Mar 11–17	Understanding confidence intervals, cont'd. Understanding null hypothesis tests	Activity 4	
Mar 18–24	t confidence interval and test for mean t confidence interval and test for difference in means <b>Lab:</b> one sample and two sample t procedures in R		
Mar 25–31	Simple linear regression <b>Mar 28: no class section 201</b> <b>Mar 29: no class section 200 (Good Friday)</b> <b>Lab:</b> Linear regression in R	Activity 5	
Apr 1–7	One-factor ANOVA Large sample confidence interval and test for proportion ( <i>time permitting</i> ) <b>Lab:</b> One-factor ANOVA in R	Assignment 3: <i>Analysis &amp; Conclusion</i>	
Apr 11–30	<b>Final Exam Period</b> <b><i>Do not schedule travel until the Final Exam schedule has been posted.</i></b>		

*\*Make-up midterm only for students with academic consideration from Faculty Academic Counselor*

## Course Materials

---

### Required materials

These materials are “required” in that each student needs access to them to be successful in the course. In addition to these three main resources, we will occasionally use articles, videos, and applets available freely online to supplement your learning.



The OWL Brightspace site, **STATS 2244B 200: Statistics for Science** is used heavily; students are responsible for checking the site on a regular basis. It provides:

- Lecture and lab materials
- Assessment instructions and materials
- Practice questions
- Communication tools (Discussions, Announcements)
- Calendar of due dates and help sessions



The **Lab** component of the course requires using the statistical software program **R** and the integrated development environment, **R Studio**, to work with data and communicate. Both software packages are free to download to your personal computer (*best experience*) or for limited use through a browser (*if necessary*). Instructions for downloading/accessing R and R Studio is on the OWL site as part of Lab 1.

*If you need assistance with OWL, please seek support on the OWL Brightspace help page: [brightspacehelp.uwo.ca](http://brightspacehelp.uwo.ca). Alternatively, contact the [Western Technology Services Helpdesk](#) (by phone at 519-661-3800 or ext. 83800). [Google Chrome](#) or [Mozilla Firefox](#) are the preferred browsers to optimally use OWL and our course materials. Ensure your browser is up-to-date.*

## Methods of Evaluation

---



This course uses **Specifications Grading** for some elements; briefly, this means that there will be a list of requirements ('specifications') that all must be met to earn credit for a particular assessment and/or bundle in the grading scheme. Those specifications will ALWAYS be communicated in advance. If—at ANY time—you are uncertain about expectations for an assessment or about the grading, **ask for clarification**. If you're interested in learning more about "Specs Grading" in general, there's a great blog post about it available [here](#).

### Overview of Grading Distribution

The evaluation in this course is set up to promote mastery of much of the material and skills by the end of the course, and to provide some opportunities to learn from mistakes. To achieve these objectives, I use a flexible evaluation scheme. There are four (4) different types of assessment you will be evaluated on: Assignments, Activities, a Midterm, and the Final Exam. The baseline distribution of 'weight' for each of these elements is described below, and then three alternative weighting schemes are provided. **In all cases, your final course grade will automatically be calculated to give you the highest possible course mark.**

Component	Baseline	Alternative 1	Alternative 2	Alternative 3
Assignments	40%	40%	40%	40%
Activities	15%	15%	5%	5%
Midterm	15%	5%	15%	5%
Final Exam	30%	40%	40%	50%



## Essential Requirements to pass Biol/Stat 2244

There are TWO (2) criteria that must be met for a student to be *eligible* to earn a passing grade (i.e. 50% or more) in Biology/Statistics 2244. These are:

- earning at least 20% for the Assignments component (achieved as described below), **AND**,
- earning at least 40% on the Final Exam.

Failing to meet either or both of these two criteria will result in a **final course grade of 40%** (or your actual computed grade, whichever is lower) being assigned, regardless of your achievements on other components of the course.

## Determining your Assignments Component

The *Assignments* component of your overall course grade is based on achievement across three important (3) *Assignments*. Each *Assignment* evaluates your mastery on a subset of three (3) course-level learning outcomes (see page 4); your mastery of each course-level learning outcome is graded against a 4-level rubric using **M** = Mastery (highest level), **P** = Proficient, **A** = Approaching proficiency, **N** = Not met (lowest level); the specifics of the rubric and expectations for each level are provided with each Assignment's instructions. The number of **M**, **P**, **A**, and **N** levels you achieve (and hence, the number of learning outcomes for which you demonstrate some level of proficiency) across the three Assignment determines 40% of your course grade. The final Assignments Component out of 40% will be based on the highest 'bundle' of accomplishments that you fulfill *in its entirety*, as described in the following table.

To earn:	Achieve ALL of the following specifications:
40	<ul style="list-style-type: none"><li>• submit all 3 Assignments</li><li>• earn level <b>M</b> across all Assignment learning outcomes</li></ul>
38	<ul style="list-style-type: none"><li>• submit all 3 Assignments</li><li>• earn 8 level <b>M</b> and no level <b>A</b> or <b>N</b> across the Assignment learning outcomes.</li></ul>
35	<ul style="list-style-type: none"><li>• submit all 3 Assignments</li><li>• earn at least 6 level <b>M</b>, no more than 1 level <b>A</b>, and no level <b>N</b> across the Assignment learning outcomes</li></ul>
30	<ul style="list-style-type: none"><li>• submit all 3 Assignments</li><li>• earn at least 5 level <b>P</b>, no more than 2 level <b>A</b> and no more than 1 level <b>N</b> across the Assignment learning outcomes</li></ul>
25	<ul style="list-style-type: none"><li>• submit all 3 Assignments</li><li>• earn at least 5 level <b>P</b>, no more than 3 level <b>A</b> and no more than 1 level <b>N</b> across the Assignment learning outcomes</li></ul>
20	<ul style="list-style-type: none"><li>• submit all 3 Assignments</li><li>• earn at least 5 level <b>P</b> and no more than 2 level <b>N</b> across the Assignment learning outcomes</li></ul>

## Determining your Midterm and Final Exam Components

Both the Midterm and Final Exam are graded on a traditional points-based scale. Consequently, your grade for each will be calculated according to the following formula:

$$\frac{\text{achieved points on exam}}{\text{total possible points for exam}} \times \% \text{ exam weighting}$$

For example, if a student earns 22 out of a possible 30 points on the Midterm, then their Midterm component (15%, based on the Baseline distribution above) will be  $(22/30) \times 15\% = 11\%$ .

## Determining your *Activities* Component

The *Activities* component of your overall course grade is based on achievement on a set of five (5) *Activities*. These *Activities* are graded on a 3-level rubric using **F** = Full credit (highest level), **P** = Partial credit, and **N** = No credit/Not submitted (lowest level). The specifics of this rubric and expectations for each level are provided with each *Activity*'s instructions. The number of **F**, **P**, and **N** levels you achieve determines the *Activities* component of your grade. The final *Activities* component out of 15% (as per the 'Baseline' grading distribution from page 6) will be based on the highest 'bundle' of accomplishments that you fulfill in its entirety, as described in the following table.

To earn:	Achieve ALL of the following specifications:
15%	<ul style="list-style-type: none"><li>submit all <b>5</b> <i>Activities</i></li><li>earn at least <b>4</b> level <b>F</b> and no level <b>N</b></li></ul>
12%	<ul style="list-style-type: none"><li>Submit at least <b>4</b> <i>Activities</i></li><li>Earn at least <b>3</b> level <b>F</b> and no more than one level <b>N</b></li></ul>
9%	<ul style="list-style-type: none"><li>Submit at least <b>4</b> <i>Activities</i></li><li>Earn at least <b>2</b> level <b>F</b> and no more than one level <b>N</b></li></ul>
6%	<ul style="list-style-type: none"><li>Submit at least <b>3</b> <i>Activities</i></li><li>Earn at least <b>3</b> level <b>P</b> across the submitted <i>Activities</i></li></ul>
3%	<ul style="list-style-type: none"><li>Submit at least <b>2</b> <i>Activities</i></li><li>Earn 1 level <b>F</b> <b>AND</b> 1 level <b>P</b> across the submitted <i>Activities</i></li></ul>

For the Alternative 2 or Alternative 3 grading distribution (see page 6) where *Activities* are worth 5% total, the value out of 15% earned from the above table will be rescaled out of 5%. For example, a student who would have earned the 12% bundle would earn  $12/15 \times 5\% = 4\%$  out of the possible 5% under the Alternative 2 or Alternative 3 grading distribution.

Failing to meet the specifications for the lowest (3%) level for *Activities* will simply result in an *Activities* component of 0 out of the possible 15% (or 5% under the Alternative grading distributions). Note that there are no intermediate levels (for example, no possibility to obtain 14%).

## Assessment Descriptions

There are four (4) types of Assessment used in this course. Each will be described briefly in this section; more comprehensive details will be provided for each assessment on the OWL course site, under the "Assignments" tool.

### **Assignments.**

**WHY?** The *Assignments* are created to demonstrate your level of mastery on a subset of important course-learning outcomes (see **page 4** in this syllabus) in an authentic manner, including your use of the statistical software, R.

**WHAT?** There are three (3) *Assignments*, each composed of a couple short answer questions requiring written responses (possibly including graphs/tables and/or R code and output). The *Assignments* move progressively through the stages of the PPDAC framework<sup>3</sup>, and involve answering questions that relate to an overall research objective and set of related research questions. Each *Assignment* will address a subset of three (3) of the course-level learning outcomes; each learning outcome will be graded on a 4-level rubric, which will be provided in the *Assignment* instructions.

**HOW?** All assignments must be completed in an R markdown file (.RMD) and knitted, with the knitted file saved to PDF format for submission<sup>4</sup>. All *Assignments* must be uploaded to the OWL "Assignments", AND to Gradescope.ca.

<sup>3</sup> Mackay, R.J., and R.W. Oldford. 2000. Scientific method, statistical method, and the speed of light. *Statistical Science* 15(3): 254-278.

<sup>4</sup> You will learn about R markdown files and 'knitting' in Lab 3.



### **Activities.**

**WHY?** The *Activities* are created to (i) encourage timely completion of the lab content and keeping up with lecture content, (ii) give opportunities to practice what you are learning, (iii) represent stepping points towards the type of skills/knowledge tested on Assignments and/or Exams, and (iv) provide early feedback on your achievement of course-level learning outcomes.

**WHAT?** There are five (5) *Activities* planned for the course. The *Activities* are graded on 3-level rubric that will be provided with the *Activity* instructions. Generally, the *Activities* focus on applications of concepts or skills recently covered in the lecture and/or lab materials.

**HOW?** The method of completion and submission varies depending on the particular *Activity*. All *Activities* will have instructions provided through the OWL "Assignments", with corresponding access to the Gradescope.ca submission.

### **Midterm.**

**WHY?** The *Midterm* serves as an important opportunity to demonstrate your understanding, application, and integration of the course material from the first part of the course.

**WHAT?** The *Midterm* will be composed of several short answer questions, which may involve calculations, drawings, etc. The *Midterm* is closed-book, but you may bring a One-Pager (i.e. a single-sided 8.5" x 11" page with notes, reminders, etc). The *Midterm* will be graded using a traditional points-based system (e.g.  $x / 20$  points achieved).

**HOW?** The *Midterm* will be written on paper and take place in-person, on campus, at a scheduled time/location (outside of lecture time). More details will be posted on OWL closer to the test date.

### **Final Exam.**

**WHY?** The *Final Exam* serves as an important opportunity to demonstrate your understanding, application, and integration of the course material, including some application of the skills/concepts associated with the statistical software, R.

**WHAT?** A **cumulative** exam with several short answer questions, which may involve calculations, drawings, and interpretation of data. The *Final Exam* is closed-book, but you may bring a One-Pager (i.e. a single-sided 8.5" x 11" page with notes, reminders, etc.). The *Final Exam* will be graded using a traditional points-based system (e.g.  $x / 20$  points achieved).

**HOW?** The *Final Exam* will be written on paper and take place in-person, on campus, at a time/location scheduled by the University Registrar. More details will be posted on OWL once the exam date and time is assigned.

## **2244 Policy on use of Artificial Intelligence (AI) generative tools**

Over the past year, AI tools (i.e. large language models, natural language processing applications, chatbots; e.g. ChatGPT, DALL-E 2, Sudowrit, Grammarly, etc., etc.) have been introduced to the general public. Discussions have been prolific in post-secondary education about how and why such AI tools should/shouldn't be used in academia. Suffice to say, there is little agreement and still a lot to learn. Based on current state of knowledge and relevance to THIS course (i.e. where transparency of approaches and reproducibility of data are key values), I have developed a policy that we will follow as a learning community in Biol/Stats 2244. The barebones of this policy are summarized below. **You should take a few minutes to review the complete policy—which includes a discussion of the philosophy behind the policy, and the (significant) concerns about the accuracy, bias, and transparency of AI tools—, that is available on the OWL course site as part of Topic 1: Introduction to 2244.** If any part of this policy is confusing or uncertain, please reach out to me for a conversation before submitting your work. Note that violations of this policy are considered violations of Western's academic integrity and scholastic offense policies.

1. Any assessments that were created with the help of AI tools (at any point in completing the assessment) should clearly indicate (by descriptive narrative) what work/ideas are yours and what content/ideas were generated by the AI tool. You must also cite the tool(s) used. For example, if using ChatGPT-3, you would cite using a format such as: "ChatGPT-3. (YYYY, Month DD of query). "Text of your query." Generated using OpenAI. <https://chat.openai.com/>".
2. In cases where AI tools are used, no more than 25% of the submitted work should be generated by AI.
3. Keep transcripts of your "conversations" (prompts plus responses) as documentation/support of your use. A simple approach to take is to use screenshots.

## Accommodated Evaluations

**All Assignment and Activity deadlines have an automatic 48-h 'grace period'**. That is, if you cannot make the original deadline set (Fridays at 11:55 pm EST unless otherwise noted), you will have an additional 48-h period during which you can still submit the assessment **without** requiring any academic consideration from Academic Counseling, or permission from the instructor, and **without any late penalty**. There is no limit on the number of assessments for which you 'use' the 48-h grace period. So, if you need some or all of that extra 48 hours to get these assessments submitted properly, simply take it—no questions asked. Beyond that 48-h grace period, late Activities *without* academic consideration will not be accepted. **Late Assignments will be accepted up to three days after the end of the 48-h grace period, but will incur a late penalty** (the nature of the late penalty is described in the instructions for each *Assignment*). Late Assignments will NOT be accepted more than three days after the end of the 48-h grace period unless academic consideration is obtained.

**Note that the 48-h grace period does NOT apply to the *Midterm* or the *Final Exam*.**

To obtain academic consideration for missed Assignments, Activities, or the Midterm (or for requests to submit Assignments or Activities beyond the 48-h 'grace period' without late penalty), you must provide valid medical or supporting documentation to the Academic Counseling Office of your Faculty of Registration as soon as possible (for Faculty of Science students, see [https://www.uwo.ca/sci/counselling/advising\\_services/index.html](https://www.uwo.ca/sci/counselling/advising_services/index.html)). For further information, please consult the University's medical illness policy at [https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/accommodation\\_medical.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf). The Student Medical Certificate is available at [https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf).

How academic consideration from Academic Counseling is handled depends on the assessment item being accommodated, as described below:

- **Assignments** granted an extended deadline consideration through Academic Counseling (i.e. beyond the 48-h grace period) should be discussed with your instructor via an email to [jwaugh2@uwo.ca](mailto:jwaugh2@uwo.ca) **with subject line starting with "2244B"** as soon as possible to identify a suitable deadline. *It is in your best interest to work on the Assignment (if capable of doing so) while the request for academic consideration is being evaluated by Counselling or while waiting for a new deadline from the instructor.* If the Assignment cannot be submitted prior to the date that the graded Assignment (or a solutions file) is returned to the rest of the class, then an INC will be issued for the course grade. The missed Assignment will be completed the next time the course is offered or at a time arranged between the student and instructor.
- **Activities** granted an extended deadline consideration through Academic Counseling (i.e. beyond the 48-h grace period) should be submitted prior to the feedback for the Activity being returned to the class. If the Activity cannot be submitted before that time, you may be asked to complete an alternative version of the Activity, or, a rescaling of the Activities component grading scheme may occur, at the discretion of the instructor.
- There will be one make-up **Midterm** for students who have obtained academic consideration through Academic Counseling for missing the original *Midterm*. Students who are scheduled to write the make-up *Midterm*, but cannot due to conflict or other circumstances that are accommodated by Academic Counseling will have their *Final Exam* reweighted accordingly.

**Note:** missed/late work will *only* be excused through one of the mechanisms above. Being asked not to attend an in-person course requirement (i.e. Midterm or Final Exam) due to potential COVID-19 symptoms is not sufficient on its own. I will also not grant extended deadlines, etc. without academic consideration supported by Academic Counseling; this policy is to prevent exacerbating inequities that might already exist among students.

Click [here](#) for a detailed and comprehensive set of policies and regulations concerning examinations and grading.

### **Rounding of Marks Statement**

Across the Sciences Undergraduate Education programs, we strive to maintain high standards that reflect the effort that both students and faculty put into the teaching and learning experience during this course. All students will be treated equally and evaluated based only on their actual achievement. **Final grades** in this course, irrespective of the number of decimal places used in marking individual assignments and tests, will be calculated to one decimal place and rounded to the nearest integer, e.g., 74.4 becomes 74, and 74.5 becomes 75. Marks WILL NOT be bumped to the next grade or GPA, e.g. a 79 will NOT be bumped up to an 80, an 84 WILL NOT be bumped up to an 85, etc. The mark attained is the mark you achieved, and the mark assigned; requests for mark “bumping” will be (politely) denied. Similarly, requests for alternative assessments, submission of revisions of assessments to increase marks, or requests for ‘exceptions’ to a grading scheme will be (politely) denied on the basis that making such exceptions lacks transparency and reduces equity among students in the course.

## **Accommodation and Accessibility**

---

### **Accommodation Policies**

Students with disabilities are 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 policy can be found at: [https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic\\_Accommodation\\_disabilities.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf)

### **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 accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at <https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>.

### **Absences from Final Examinations**

If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a “Multiple Exam Situation” (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under [Special Examinations](#)).

## Academic Policies

---

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

In accordance with policy, [https://www.uwo.ca/univsec/pdf/policies\\_procedures/section1/mapp113.pdf](https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf), 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.

**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 Web site:  
[http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/scholastic\\_discipline\\_undergrad.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf).

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 (<http://www.turnitin.com>).

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

Personal response devices ("clickers") or similar technology may be used in this course for the purpose of engagement during in-person learning and/or to provide informal feedback to your instructor about student understanding. Such technology use will not contribute to course grades. Any personal data collected (e.g. student usernames/identification and responses to questions) will be treated like other confidential course-related data.

In the event of a university-declared emergency that requires some or all of the course to be delivered online, 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 would, consequently, 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>.

### Professionalism & Privacy

Western students are expected to follow the [Student Code of Conduct](#). Additionally, the following expectations and professional conduct apply to this course:



- ✓ Students are expected to follow online etiquette expectations provided on OWL
- ✓ All course materials created by the instructor(s) are copyrighted and cannot be sold/shared
- ✓ Recordings are not permitted (audio or video) without explicit permission
- ✓ Permitted recordings are not to be distributed
- ✓ Students will be expected to take an academic integrity pledge before some assessments
- ✓ All recorded sessions will remain within the course site or unlisted if streamed

### Remote learning sessions for this course may be recorded.

Occasionally, your instructor may use remote learning technology (e.g. Zoom) for Student Hours or other purposes; these learning sessions may be recorded. The data captured during these recordings may include your image, voice recordings, chat logs, and personal identifiers (name displayed on the screen). The

recordings will be used for educational purposes related to this course, including evaluations. The recordings may be disclosed to other individuals participating in the course for their private or group study purposes. Please contact the instructor if you have any concerns related to session recordings.

Participants in this course are not permitted to record the sessions, except where recording is an approved accommodation, or the participant has the prior written permission of the instructor.

## Copyright Statement

Please be aware that all course materials created by the instructor(s) are copyrighted and cannot be **sold/shared**. Those include materials used in lectures, labs, tests/quizzes, assignments, midterms, activities, and finals. Any posting/sharing of such materials in part or whole without owner's consent is considered as violation of the Copyright Act and will be considered as a scholastic offence.

In addition, online services such as Chegg are actively monitored. Any questions that are coming out during midterms and finals and are posted to an online service will be searched. Such an activity will be considered as a scholastic offence and will result in academic penalty.

## Support Services

---

Please visit the Science Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>

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. You may also wish to contact Accessible Education at [http://academicsupport.uwo.ca/accessible\\_education/index.html](http://academicsupport.uwo.ca/accessible_education/index.html) if you have any questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (<http://www.learning.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

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](https://www.uwo.ca/health/student_support/survivor_support/get-help.html).

To connect with a case manager or set up an appointment, please contact [support@uwo.ca](mailto:support@uwo.ca).

Additional student-run support services are offered by the USC, <http://westernusc.ca/services>.

## Land Acknowledgement

---

We acknowledge that Western University is located on the traditional lands 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 (First Nations, Métis and Inuit) whom we recognize as contemporary stewards of the land and vital contributors of our society. Throughout Canada, North America, and the world, Indigenous Peoples are vital contributors to their communities, and we greatly value their presence, knowledge, and wisdom.