Department of Biology
and
Department of Statistical and Actuarial Sciences
Biology/Statistics 2244A – "Statistics for Science"

Course outline for Fall 2021

Western University is committed to a **thriving campus**. We encourage you to check out the Digital 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/.

Technical Requirements

Stable internet connection

Laptop or computer

Important Dates

Classes Start	Drop Deadline	Classes End	Exam Period
Sept 8	Nov 12	Dec 8	Dec 10-21

*Last day to drop a first-term half-course without academic penalty.

Course Information

Biology/Statistics 2244A, sections 001 and 002, FW21

An introductory course in the application of statistical methods, intended for 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.

List of Prerequisite(s)

A full (1.0) mathematics course, or equivalent, numbered 1000 or above. Statistical Sciences 1024A/B 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, Statistical Sciences 1024A/B): Economics 2122A/B, Economics 2222A/B, Geography 2210A/B, Health Sciences 3801A/B,MOS 2242A/B, Psychology 2810, Psychology 2820E, Psychology 2830A/B, Psychology 2850A/B, Psychology 2851A/B, Social Work 2207A/B, Sociology 2205A/B, Statistical Sciences 2035, Statistical Sciences 2141A/B, Statistical Sciences 2143A/B, Statistical Sciences 2858A/B, Statistical Sciences 2037A/B if taken prior to Fall 2010, former Psychology 2885 (Brescia), former Statistical Sciences 2122A/B, former Social Work 2205.

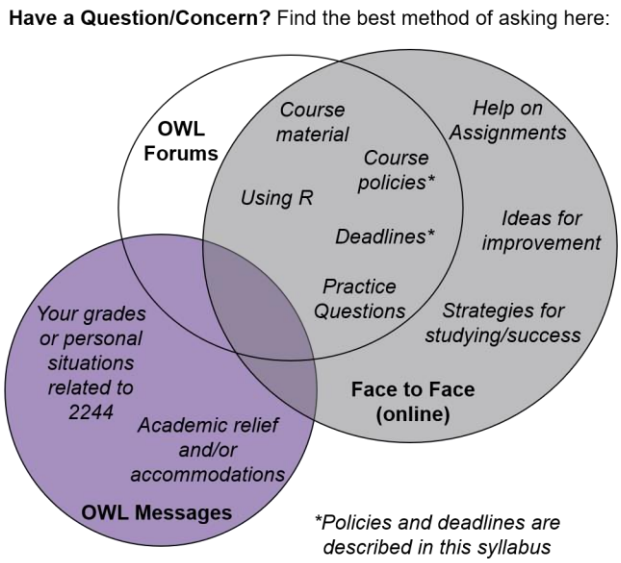
Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped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

Instructor Information

Course Coordinator
Jennifer Peter

Contact Information
Use *OWL Messages* to Jennifer Peter

My email address is too close to someone else's; using OWL Messages avoids lost/misdirected communications and helps me organize my inbox. It also ensures that you use your UWO contact information to connect with me.



Student Hours
Student hours (times in-person and through Zoom to meet with your instructor to get help, etc.) will occur weekly, with times determined by a student poll at the start of term.

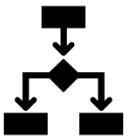
Course Schedule and Delivery Mode

Universal Design for Learning

UDL

This course has been designed using the principles of **Universal Design for Learning** ("UDL"), which "focuses on eliminating barriers through initial designs that consider the needs of diverse people"[1]. Consequently, you will encounter choice for many parts of the course: course material will be available in multiple formats, some assessments will offer a choice of topic/approach, and, diagnostic assessments will be available for most course topics to help you efficiently allocate your time for learning the course material. One major side effect of this design is that it will look like there is a lot to do for the course. Keep in mind that some of the available content will be redundant and is available simply to support your preferred learning approach or interests.

Delivery of course material



This course is timetabled as an in-person course. That means that the lectures occur on campus, at the times/locations described in the table on the next page. **However**, in keeping with Universal Design for Learning, the **lecture material** will also be available as pre-recorded online modules on the OWL course site; students may choose the delivery mode that best suits their needs/wants. The **lab material** will be presented as a series of *online modules* through the OWL course site (in keeping with previous years of the course), with the scheduled lab sections used as ***optional*** periods to access help and guidance from TAs about the lab material.

[1] 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.

The schedule for in-person components is provided in the following table. Note that the lab sections will **NOT** be used each week of the term; refer to the Calendar on OWL and course communications about when the lab periods will be used.

Component	Section	Days/Times	Location
Lectures	001	Mondays/Wednesdays, 10:30-11:30 am EST	NS 145
	002	Tuesdays/Thursdays, 4:30-5:30 pm EST	NS 145
Labs	004	Tuesdays, 6:30-9:30 pm EST	HSB 16
	005	Wednesdays, 6:30-9:30 pm EST	HSB 14
	006	Wednesdays, 6:30-9:30 pm EST	NCB 105
	007	Thursdays, 6:30-9:30 pm EST	HSB 16
	008	Thursdays, 6:30-9:30 pm EST	HSB 14
	009	Fridays, 11:30 am-2:30 pm EST	HSB 14
	010	Tuesdays, 1:30-4:30 pm EST	HSB 13
	011	Tuesdays, 1:30-4:30 pm EST	HSB 16
	012	Thursdays, 1:30-4:30 pm EST	HSB 16
	013	Thursdays, 1:30-4:30 pm EST	HSB 14
	014	Tuesdays, 6:30-9:30 pm EST	HSB 14
	015	Thursdays, 6:30-9:30 pm EST	NCB 105
	016	Tuesdays, 6:30-9:30 pm EST	NCB 105

Contingency plan for an in-person class pivoting to 100% online learning

In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

Learning Outcomes

This course is meant to be both introductory and comprehensive, conceptual and practical. At a fundamental level, the course is organized to ***demonstrate that statistics is a scientific discipline that can and should inform research at all stages***, from problem definition to 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 (MacKay and Oldford 2000).

More specifically, by the end of the course, a successful student should be able to:

Design sampling and study procedures to collect relevant data addressing a research question.	• Distinguish among common sampling and study designs. • Identify issues associated with sampling and study design (e.g. bias, validity, confounding) • Identify relevant inference procedures based on research question and variables.
Create and interpret appropriate summaries of data.	• Select summaries based on research question and variables. • Interpret summaries to identify and/or describe patterns, trends, and interesting features in data.
Analyse data using inference procedures to address a research question.	• Select appropriate inference procedures for a research question. • Interpret and describe confidence intervals and hypothesis test results. • Evaluate the fit of models for common parametric inference procedures. • Recognize situations and data that may require alternative (i.e. not covered in this course) inference procedures.
Use statistical software to explore, summarize, analyse, interpret, and communicate data.	• Use R to create and modify graphical and numerical summaries of data. • Use R to conduct common parametric inference procedures, including evaluating conditions for model fit. • Interpret R (including accompanying code) or other statistical software output correctly.
Communicate statistical concepts, analyses, and arguments in an accurate and scholarly manner.	• Apply vocabulary to describe statistical concepts, procedures, and ideas. • Apply conventional formats for reporting and interpreting results of statistical analyses in written/graphical form. • Justify the choice of statistical procedures (e.g. selected study designs).
Describe models and/or conceptual background for common inference procedures.	• Describe the models for common inference procedures. • Describe sampling distributions (based on simple random samples) for commonly used statistics.

Course timetable

Some adjustments to this timetable may be made based on our progression through the material; any changes to due dates will be announced on OWL.

Week	**Lecture/Lab Topic(s)**	**Assignments due Friday at 11:55 pm EST** (unless otherwise noted)	**Activities due Friday at 11:55 pm EST** *Not all of these are required!	**Tests** Dates are tentative, subject to Exam Central confirmation
Sept 6-12	PPDAC: A scientific inquiry framework			
Sept 13-19	Sampling designs & considerations Lab 1: Getting to know R			
Sept 20-26	Study designs & considerations Lab 2: Working with Data in R		• CORE 1 - Representativeness of sampling • Reflection 1 - Planning • Application 1 - Plan stage	
Sept 27-Oct 3	Planning ahead: Sampling variability Summarizing & Exploring Data Lab 3: R script and R markdown files	Assignment 1: Planning a research study	• R practice 1 - Working with data in RMD files	
Oct 4-10	Probability Models & Vocabulary Lab 4: Summarizing & Visualizing Data in R	Resource File Project Phase 1	• Reflection 2 - Balance	
Oct 11-17	Probability Models: Binomial models Probability Models: Normal models		• Summary 1 - Data summaries • R practice 2 - Summarizing data • Application 2 - Choosing summaries	
Oct 18-24	Sampling distributions Understanding confidence intervals	Assignment 2: Summarizing and exploring Data	• CORE 2 - Sampling distributions • Reflection 3 – Muddiest point	
Oct 25-31	t confidence interval for the mean Large sample confidence interval for proportion Lab 5: t procedures for means in R	Resource File Project Phase 2	• Application 3 - Distributions	Test 1 – Saturday, Oct. 30, 7:00–8:30 pm EST
Nov 1-7	**Fall Reading Break**			
Nov 8-14	Understanding null hypothesis testing		• CORE 3 - Confidence intervals • Reflection 4 - Looking forward • Summary 2 - Describing data	
Nov 15-21	Large sample test for the proportion t test for the mean Lab 6: large sample procedures for proportions in R	Assignment 3: Analysis & Conclusion		Test 2 – Saturday, Nov. 20, 10:00 am–12:00 noon EST

Nov 22-28	t confidence interval and test for difference in means Large sample confidence interval and test for difference in proportions Lab 7: two sample procedures in R		• R practice 3 - Inference • Summary 3 - Models • Application 4 - Choosing procedures	
Nov 29-Dec 5	Simple linear regression (t confidence interval and test for slope) Lab 8: Linear regression in R	Assignment 4: Analysis & Conclusion	• Reflection 5 - Nature of statistics • R practice 4 - Review	
Dec 6-8	One-factor ANOVA and follow up analyses Lab 9: One-factor ANOVA in R	Resource File Project Phase 3 due Wednesday, Dec 8 at 11:55 pm EST	• Summary 4 - Sampling distributions	
Dec 10-21	**Final Exam Period; do not book travel, etc. until exam schedule is finalized.**			

Course Materials

Required materials

These materials are "required" in that each student needs *access* to them to be successful in the course. Whether that access is individual, shared digitally by a group of individuals, or borrowed from the commons is up to you. In addition to these three main resources, we will occasionally use articles, videos, and applets available freely online to supplement your learning. ***If you discover any (open access) resources that are helpful to you for this course, I encourage you to share the details with the rest of the class!***

The OWL site (http://owl.uwo.ca, "STAT 2244A 001 FW21") is used heavily; students are responsible for checking the site on a regular basis. It provides:

- Lecture and lab materials
- Assignment instructions and materials
- Access to graded assessments
- Practice questions
- Communication tools (Zoom, OWL Messages, Forums)

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 us through a browser (*if necessary*). Instructions for downloading/ accessing R and R Studio is on the OWL site.

If you are the type of student who finds having a textbook helpful, the 'official' course textbook is: Baldi, B. and DS. Moore. 2018. ***The Practice of Statistics in the Life Sciences.*** **4th Ed.**, W.H. Freeman and Company. This book is available in hard copy or ebook on the platform "**Achieve"** (a limited term subscription, cheapest through the UWO Bookstore). I also provide open-access (i.e. free) equivalents for many course topics where possible. **The textbook is NOT required.**

If you need assistance with OWL, please seek support on the OWL Help page. 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 a combination of more traditional grading schemes and ***Specifications Grading***; the information provided below should be sufficient to understand how your grade will be calculated. However, if at ANY time you are uncertain on how your grade is determined, or what is required to earn credit for the course, **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

Your course grade is determined through a combination of the ***quality*** and ***quantity*** of the work you submit. Your grade is composed of two (2) components:

1. Your ***'Base Grade'*** of 40%, 50%, 60%, or 65%; the base grade is determined by the grades earned on *Assignments* and the *Activities* you successfully complete, as well as your success on the *Final Exam*. The Base Grade is an implementation of Specifications Grading.
2. Your ***'Grade Increments'*** which add additional percentage points onto your Base Grade using a more traditional grading approach, based on your success on:
    - the two *Tests* (15% total)
    - the *Final Exam* (10%)
    - the *Resource File Project* (10%)

Determine your Base Grade

Your Base Grade is based on the highest graded 'bundle' of accomplishments that you fulfill in its entirety.

To earn:	Accomplish ALL of the following:
65	• submit all four (4) *Assignments* • earn a grade of at **least 95% and/or all rubric level 4s** on **each** of the four (4) *Assignments* • earn credit for **all 3 Core** *Activities* • earn credit for 1 *Activity* from **each** of the following *Activity* classes: (i) Summary, (ii) R practice, (iii) Application, (iv) Reflection • earn credit for 3 additional *Activities* of your choice • earn a grade of at **least 85%** on the *Final Exam* (see note * below)
60	• submit all four (4) *Assignments* • earn a grade of at **least 85% and/or all rubric level 3s** on **each** of the four (4) *Assignments* • submit all **3** core Activities and earn credit for **at least 2** of the 3 **core** *Activities* • earn credit for 1 *Activity* from each of the following non-core *Activity* classes: (i) Summaries, (ii) R practice • earn credit for 2 additional non-core *Activities* of your choice • earn a grade of at **least 75%** on the *Final Exam* (see note * below)
50	• submit all four (4) *Assignments* • earn a grade of at **least 75% and/or all rubric level 3s** on **at least 3** of the four (4) *Assignments* • earn credit for **at least 6** *Activities* of your choice • earn a grade of at **least 50%** on the *Final Exam* (see note * below)
40	• submit at least three (3) of the four (4) *Assignments* • earn a grade of at **least 50% and/or all rubric level 2s** on **at least 3** of the four (4) *Assignments* • earn credit for **at least 6** *Activities* of your choice • earn a grade of at **least 50%** on the *Final Exam* (see note * below)

*****Failing to meet the specified minimum grade for the *Final Exam* will result in a 5% deduction from the Base Grade (assuming all other requirements for the Base Grade are met). For example, a student working towards a Base Grade of 60% who does not earn at least 75% on the *Final Exam* will earn a Base Grade of 60% – 5% = 55% (to which their Grade Increments will be added as normal).

Failing to meet the specifications for the 40 Base Grade will result in a *final course grade* of 45% being assigned, regardless of success on the Grade Increments. This means that the *minimum* that must be achieved to be eligible to earn credit (i.e. 'pass'/50%) in Biology/Statistics 2244 is the specifications for the 40 Base Grade, plus sufficient percentage points earned through the Grade Increments and other Essential Requirements.

Determine your Grade Increments

Up to 35% could be added to the Base Grade earned, according to your achievement with the *Tests*, *Final Exam*, and *Resource File Project*.

Final Exam Increment. Any achievement on the *Final Exam* above the required minimum mark for your Base Grade can earn you up to an additional 10%. Remember that each Base Grade level has a minimal requirement for the *Final Exam* mark (e.g. Base Grade of 65% requires a minimum of 85% on the *Final Exam*).

The *Final Exam Increment* rewards achievement *above* the minimal requirement for the Base Grade. This Increment is computed as the portion of 10% proportional to your success above the minimal requirement, according to the following calculation:

$$\frac{achieved\ exam\ grade - minimum\ required\ by\ base\ grade}{100\% - minimum\ required\ by\ base\ grade} \times 10\%$$

For example, a student with a Base Grade of 65% who earns a 90% on the *Final Exam* will receive a *Final Exam Increment* of

$$\frac{90\% - 85\%}{100\% - 85\%} \times 10\% = 3.33\%$$

In situations where the exam grade is *less than* the minimum required exam grade dictated by the Base Grade, no increment (i.e. 0%) will be awarded. The 5% deduction to the Base Grade described at the top of this page will be applied.

Resource File Increment. Achievement on the *Resource File Project* can earn you up to 10%. This *Resource File Increment* is computed as:

$$\frac{achieved\ resource\ file\ grade}{total\ possible\ marks\ for\ resource\ file} \times 10\%$$

For example, if the *Resource File Project* is marked out of 40 points total and a group earns 33 of those points, then the *Resource File Increment* will be:

$$\frac{33}{40} \times 10\% = 8.25\%$$

Tests Increment. Each *Test* is assigned 7.5% from the total 15% allocated to the *Tests Increment*; for each *Test*, you earn a fraction of the 7.5% according to the following formula:

$$\frac{achieved\ grade\ on\ Test}{total\ possible\ marks\ for\ Test} \times 7.5\%$$

Your final *Tests Increment* will be the sum of the mark out of 7.5% for each of the two *Tests*.

Assessment Descriptions

There are five (5) types of Assessment used in this course. Each will be described briefly in this section; more comprehensive details, including definitions of what is required to earn credit and grading rubrics/expectations will be provided on the OWL course site.

Assignments.

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

WHAT? There are four (4) *Assignments*, each composed of (typically) 1–3 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[2], and involve answering questions that relate to an overall research objective and set of related research questions.

HOW? The majority of the *Assignments* will be submitted as an R markdown file (.RMD), and resulting knitted .PDF file (we learn about .RMD files and knitting in labs). Both files must be uploaded to the OWL "Assignments" tool, AND the .PDF file must be uploaded to Gradescope.ca.

ESSENTIAL REQUIREMENT. Completion of at least three (3) *Assignments* and earning at least 50% and/or all rubric level 2s on at least 3 of the 4 Assignments is part of the 'Essential Requirements' to be eligible to earn credit (i.e. 50% or higher as a final course grade) for the course. Failing to meet the Essential Requirements with respect to Assignments will result in a final course grade recorded as 45% (or, your calculated course grade—whichever is lower).

Activities.

WHY? The *Activities* are created to promote (i) active learning of important 'core' course concepts, (ii) engagement with the course material, (iii) self-reflection and metacognition, and/or (iv) summarization/practice of what you are learning.

WHAT? There are at least twenty (20) *Activities* planned from which students can **choose a subset** to complete (which *Activities* and how many are chosen for completion depends on the Base Grade you are working towards). There are two main types of *Activities*: (i) **3** "Core" *Activities* which deal with important course concepts and require more work and critical thinking, and (ii) many other non-core *Activities* (typically shorter, or less challenging). The Core *Activities* will be labeled as such. The non-core *Activities* are organized into different classes (Summary, Reflection, R Practice, or Application) based on the type of exercise they involve.

HOW? The method of completion and submission varies depending on the particular *Activity*. There are, however, two main submission methods that will be used: (i) uploading to OWL "Assignments" tool and Gradescope, and (ii) as a 'quiz' through OWL "Tests and Quizzes" tool. The proper submission method and requirements for earning credit for an *Activity* will be detailed on OWL in the description of each *Activity*.

ESSENTIAL REQUIREMENT. Earning credit for at least six (6) *Activities* of your choice is part of the 'Essential Requirements' to be eligible to earn credit (i.e. 50% or higher as a final course grade) for the course. Failing to meet the Essential Requirements with respect to Activities will result in a final course grade recorded as 45% (or, your calculated course grade—whichever is lower).

Resource File Project.

WHY? The content of this course is meant to be practical, and ideally, useful for your future courses, research, and/or jobs. One of the more valuable skills you should finish the course with is basic proficiency in using the statistical software, R. The *Resource File Project* provides a collaborative opportunity to bring together practical skills in R and the 'conceptual' course material. Creating the *Resource File* should also serve as a

[2] Mackay, R.J., and R.W. Oldford. 2000. Scientific method, statistical method, and the speed of light. Statistical Science 15(3): 254-278.

method of reviewing/studying the course material, and, ideally, will result in a reference manual that may be useful after the course has finished.

WHAT? As a small group (i.e. 2-4 students), you will create a document that follows the PPDAC framework[2] for a novel dataset and research objective of your group's choosing, and demonstrates how to use the statistical software R to apply techniques (e.g. graphs, inference procedures, etc.) taught in the course. There are three (3) points in the term where parts of the *Resource File Project* will be due (to encourage continual work/planning towards the final project); these are referred to as 'Phases' for submission.

HOW? The *Resource File Project* will be submitted as an R markdown file (.RMD) and knitted to a .PDF. Both files, plus accompanying dataset (as a .CSV file), must be uploaded to the OWL "Assignments" tool, AND the .PDF output file must be uploaded to Gradescope.ca

Tests.

WHY? The *Tests* serve as low-weight opportunities to demonstrate your understanding, application, and integration of the course material.

WHAT? Two (2) **cumulative** *Tests*, each with a couple short answer and/or multiple choice questions, which may involve calculations. Tests are closed book unless otherwise specified in the description on OWL. Students may use non-programmable calculators.

HOW? Unless otherwise described on the OWL course site, the *Tests* will be in person, in assigned testing rooms on campus.

Final Exam.

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

WHAT? A **cumulative** exam with several short answer questions involving written responses as well as data analysis/interpretation. The *Final Exam* is closed book unless otherwise specified in the description on OWL. Students may use non-programmable calculators.

HOW? The *Final Exam* will be in person, in assigned testing rooms on campus during the Final Exam period, as scheduled by the University Registrar.

ESSENTIAL REQUIREMENT. Completion of the *Final Exam* is an 'Essential Requirement' to be eligible to earn credit (i.e. 50% or higher as a final course grade) for the course. Information on what will be considered 'completion' of the exam will be described on OWL. Failing to meet the Essential Requirements with respect to the Final Exam will result in a final course grade recorded as 45% (or, your calculated course grade—whichever is lower).

Accommodated Evaluations

There are two methods to obtain accommodations (e.g. handling missed work or requiring deadline extensions) in this course: (i) Self-Reported Absences, and (ii) through Academic Counselling (i.e. submitting relevant documentation to an Academic Counsellor). How accommodations are handled is described below.

All assessments during the term (i.e. *Assignments, Resource File Project, Activities,* and the *Tests*) are worth less than 30% of the course grade, and therefore are 'eligible' for accommodation via a Self-Reported Absence. The following situations apply when using a Self-Reported Absence and/or when Accommodation has been obtained from an Academic Counselor:

- *Assignments, Resource File Project*, or *Activities* should be submitted within 24 hours of the end of the 48-h period covered by a Self-Reported Absence.
- An *Assignment* granted an extended deadline accommodation through Academic Counseling (i.e. beyond that described in the point above) should be discussed with your instructor via OWL Message

to identify a suitable deadline. If the Assignment accommodation period extends beyond the point at which the graded Assignment is returned to the class, then an INC will be issued for the course. The missed Assignment will be completed the next time the course is offered.

- When a group member for the *Resource File Project* has been granted a deadline extension, the Resource File should be submitted 'as is' (i.e. without the accommodated student's contributions) by the original deadline. Then, the accommodated student's contributions to the Project can be added later, and the 'completed' Project submitted to replace the initial submission.
- Accommodation for a *Test* will result in eligibility to write a make-up *Test*; the format of the make-up *Test* may be different from the original *Test*, while maintaining the same coverage and level of difficulty. Accommodation that covers the period of the make-up *Test* may result in a reweighting of other components of the course or some other accommodation determined as equivalent by the instructor.

Note that non-core *Activities* will not accommodated; a student with accommodation for a non-core Activity deadline can simply complete a different non-core *Activity* that is still available (i.e. with a deadline that has not yet passed). It behooves students to complete *Activities* throughout the term, rather than waiting until the last weeks in the course to submit *Activities*.

All *Assignment*, *Activity*, and *Resource File Project* deadlines have an automatic 12-h 'grace period'. That is, if you cannot make the original deadline set, you will have an additional 12-h period during which you can still submit the assessment **without** requiring any of the following: accommodation from Academic Counseling, the use of a Self-Reported Absence, or permission from the instructor. So, if you need that extra 12-hours to get these Assessments submitted, simply take it—no questions asked. Beyond that 12-h grace period, late Activities *without* accommodation will not be accepted. Late Assignments or Resource File Projects will be accepted with a late penalty of at least 10% and/or 1 rubric level per 24-hour period (or part thereof). Missed assessments will not be accommodated except as described above. Note that the 12-h grace period does NOT apply to the *Tests* or the *Final Exam*.

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*** on 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.

Accommodation and Accessibility

Accommodation Policies

Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The Academic Accommodation for Students with Disabilities policy can be found at:
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic Accommodation_disabilities.pdf

Academic Consideration for Student Absence

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

(i) Submitting a Self-Reported Absence (SRA) form provided that the conditions for submission are met. To be eligible for a Self-Reported Absence:
  • an absence must be no more than 48 hours

- the assessments must be worth no more than 30% of the student's final grade
- no more than two SRAs may be submitted during the Fall/Winter term

(ii) For medical absences, submitting a Student Medical Certificate (SMC) signed by a licensed medical or mental health practitioner to the Academic Counselling office of their Faculty of Registration.

(iii) Submitting appropriate documentation for non-medical absences to the Academic Counselling office in their Faculty of Registration.

Note that in all cases, students are required to contact their instructors within 24 hours of the end of the period covered, unless otherwise instructed in the course outline. **For 2244:** when submitting a Self-Reported Absence, please do NOT send a follow-up email. Instructions on how to manage Self-Reported Absences will be communicated in advance of all deadlines; simply follow those instructions.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.**

For the policy on Academic Consideration for Student Absences – Undergraduate Students in First Entry Programs, see:
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf
and for the Student Medical Certificate (SMC), see:
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

Religious Accommodation

Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar: 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, 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 his/her 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.

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") 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. Clicker use will not contribute to course grades. Any personal data collected (e.g. student usernames/identification and responses to clicker questions) will be treated like other confidential course-related data.

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

Some of the remote learning sessions for this course 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 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 add/drop 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 Student Accessibility Services (SAS) at (519) 661-2147 if you have any questions regarding accommodations.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: https://www.uwo.ca/se/digital/

Learning-skills counsellors at the Student Development Centre (http://www.sdc.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.

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

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