



Department of Biology  
*and*

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

## Course outline for Intersession 2021

Although this academic year might be different, 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:



## 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 interpretation and conclusion. To reinforce this over-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.

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## Course Materials

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### Required materials

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> BIOL

2244A 001 SP21 is used

heavily; Students are

responsible for checking the

site on a regular basis. It

provides:

- Lecture and lab materials

- Info on assigned readings

- Assignment instructions

- and materials

- Access to Activities and

- other graded components

- Practice questions

- Communication tools

## Methods of Evaluation

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This course uses a form of **Specifications Grading**; the information provided below PLUS the discussion on the first day of the course) should be sufficient to understand how your grade will be calculated. I about [here](#). If at any time you are uncertain how your grade is determined, **ask for clarification!**

### 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:

\*Failing to meet the specified minimum grade for the Take Home 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 70% on the Take Home Exam will earn a Base Grade of 60% - 5% = 55% (to which their increment points will be added as normal).

### **Determine your Grade Increments**

Up to 35% could be added to the Base Grade earned, according to your achievement with the Quizzes, Take Home Exam, and Resource File Project.

### ***Take Home Exam***





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

### **Quizzes.**

**WHY?** The Quizzes serve as small opportunities to demonstrate your understanding, application, and integration of the course material, in addition to holding you accountable for working on the lecture and lab material on a regular basis.

**WHAT?** Three (3) **cumulative** Quizzes, each with a couple short answer and/or multiple choice questions, which may involve calculations in R. The Quizzes will be set with the expectation that a prepared student could complete the Quiz in approximately 15 minutes.

**HOW?** Unless otherwise described on the OWL course site, the Quizzes will be accessed, completed, and submitted through OWL Tests & Quizzes. These Quizzes will be timed assessments to be completed during a restricted availability period.

### **Take Home Exam.**

**WHY?** The Take Home Exam serves as an opportunity to demonstrate your understanding, application, and integration of the course material, 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 using R. The exam will be set with the expectation that a prepared student could complete the entire exam in 3-5 hours. You will, however, be given 12-h period of time to access, complete, and submit the exam (e.g. to accommodate differences in time zones and individual accommodations for learning).

**HOW?** The Take Home Exam will be submitted as an R markdown file (.rmd) and knitted to a .PDF. Both files , AND the .PDF output file must be uploaded to Gradescope.

**ESSENTIAL REQUIREMENT.** Completion of the Take Home Exam eligible to earn credit (i.e. 50% or higher as a final course grade) for the course. Information on what will be Failing to meet the requirements for this Essential Requirement will result in a final course grade recorded as 45%.

## **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 Quizzes) are -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 submission 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) can be submitted up until the time that the graded Assignment has been returned to the class. If the Assignment accommodation period extends even beyond that timeframe, then an INC will be issued. 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



the end of the period of the self-reported absence, unless noted on the syllabus. Students are not able to use the self-reporting option in the following circumstances:

for exams scheduled by the Office of the Registrar  
absence of a duration greater than 48 hours,

if a student has already used the self-reporting portal once during the summer term



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