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

Instructor Information

Course Coordinator
Jennifer Peter (she/her)
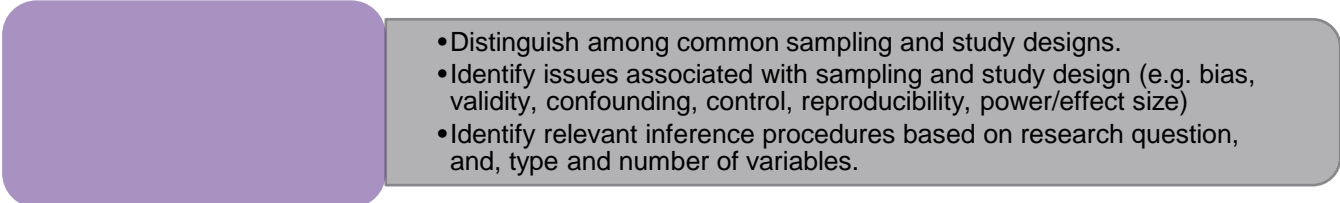
Contact Information
Use

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, affected course content will be delivered entirely online, either synchronously (i.e. at the times indicated in the timetable below) 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.

Timetable

In-person lectures occur weekly for two lecture sections:

Section 001: Wednesdays and Fridays, 12:30 pm to 1:20 pm in NCB 101
Section 002: Tuesdays and Thursdays, 3:30 pm to 4:20 pm in NS 145

- Distinguish among common sampling and study designs.
- Identify issues associated with sampling and study design (e.g. bias, validity, confounding, control, reproducibility, power/effect size)
- Identify relevant inference procedures based on research question, and, type and number of variables.

Course Schedule

Apr 2-9	Simple linear regression **Lab 9:** Linear regression in R One-factor ANOVA **Lab 10:** One-factor ANOVA in R	**Data Skills Project:** Phase 2	Reflection 3: 2244 as a model	
Apr 11-12	**Study Days**			
April 13-30	**Final Exam period**			

****Not all Activities are required!** Review the description of the "Activities Increment" on page 9, and of Activities in general on page 11.

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) r***

2. Your **Grade Increments** (48% total) which add additional percentage points onto your Base Grade using elements of a more traditional grading approach, based on your success on:

> the *Test* (10%)
> the *Final Exam Base* (20%)
> the *Final Exam Improvement Segment (3%)*
> the *Data Skills Project* (7%)
> the *Activities* (8%)

Determining your Base Grade

Your Base Grade is based on achievement on the set of three important (3*) Assignments*, the *Test,* and the *Final Exam*. Each *Assignment* evaluates your mastery on a subset of the 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), which is provided with the Assignments. 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) is a major determinant of your Base Grade. This is combined with a minimum grade requirement for the *Test* and *Final Exam* incorporated into each Base Grade. Your final Base Grade will be based on the highest graded 'bundle' of accomplishments that you fulfill **in its entirety**.

To earn:	Achieve ALL of the following specifications:
52	earn a grade of **at least 90%** on each of the Test and Final Exam submit all 3 Assignments earn level M across all Assignment learning outcomes
50	earn a grade of at **least 85%** on each of the *Test* and *Final Exam* submit all **3** Assignments earn at least **8** level **M** and no level **A** or **N** across the Assignment learning outcomes.
45	earn a grade of **at least 80%** on each of the *Test* and *Final Exam* submit all **3** Assignments earn at least **6** level **M**, no more than **1** level **A**, and no level **N** across the Assignment learning outcomes
40	earn a grade of **at least 70%** on each of the *Test* and *Final Exam* submit all **3** Assignments earn at least **5** level

For students whose *Assignment* and *Test* achievements result in a **52 Base Grade** (the highest Base Grade) or the **50 Base Grade**, a *Final Exam* grade that is higher than 90% but less than 95% will result in 1.5% *Final Exam Improvement Segment*, while a *Final Exam* grade that is 95% or higher will result in a 3% *Final Exam Improvement Segment*.

Examples of *Final Exam Improvement Segment* application: During the term, a student earned 72% on the *Test*, and had achievement on the *Assignment* learning outcomes that are consistent with the 40 Base Grade; consequently, their Base Grade entering the *Final Exam* is 40. If this student earns a *Final Exam* grade of:

> less than 80%, then their *Final Exam* grade would be consistent with the 40 Base Grade (or lower), and their *Final Exam Improvement Segment* would be 0%, because they have demonstrated work consistent (or lower) than that achieved throughout the term.

> 80% to less than 85%, then their *Final Exam* grade would be consistent with the 45 Base Grade—which is the Base Grade directly above the one determined by their *Assignment* and *Test* levels; their *Final Exam Improvement Segment* would be 1.5%.

> 85% or higher, then their *Final Exam* achievement would be consistent with either the 50 or 52 Base Grade—which is a Base Grade at least two above the one determined by their *Assignment* and *Test* achievements; their *Final Exam Improvement Segment* would be 3%.

Data Skills Project. Achievement on the *Data Skills Project* can earn you up to 7%. This *Increment* is computed as:

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For example, if Phase 1 was graded out of 20 points, and you earned 15, and Phase 2 was graded out of 40 points, and you earned 35, then your *Data Skills Project Increment* will be:

$$ \frac{1\quad 3}{20\quad 0} \qquad .00 $$

Assessment Descriptions

There are five (5) types of Assessment used in this course. Each will be described briefly in this secti 18775; more comprehensive details, including definitions of what is required to earn credit and grading rubrics/specificati 18775be provided on the OWL course site.

Assignments.
WHY? The *Assig185ment*se created to dem 18775styater level of mastery 18775ubset of the course-learning outcomes (see **page 4**

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ESSENTIAL REQUIREMENT. C

on this "One-Pager" will be provided in the *Test* information posted to the OWL 'Assignments' tool); the Test is "closed book" for all other resources. The *Test* will be graded using a traditional points-based system (e.g. x / 20 points achieved).

HOW? The *Test* will be conducted in-person, on paper, in a proctored location (details posted to OWL "Assignments" 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, possibly including practical application of the skills/concepts related to the statistical software, R.

WHAT? A **cumulative** exam with several short answer questions, which may involve calculations, drawings, and data analysis/interpretation. Students may use non-programmable calculators (e.g. standard "scientific" calculators are permitted). A one-sided, 8.5" x 11" page of memory aids, formula, definitions, etc. may be brought to the Exam (more details on this "One-Pager" will be provided in the *Exam* information posted to the OWL 'Assignments' tool). The Exam is "closed book" for all other resources. The Exam will be graded using a traditional points-based system (e.g. x / 20 points achieved).

HOW? The *Final Exam* will be conducted

An **Assignment** granted an extended deadline consideration through Academic Counseling (i.e. beyond that described in the point above) should be discussed with your instructor via OWL Message as soon as possible to identify a suitable deadline. If the Assignment cannot be submitted prior to the date that the graded Assignment 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.

Non-core Activities will not be accommodated except under the circumstance where it is the last opportunity for a student to earn credit for a particular class of non-core Activity. Otherwise, the student missing the deadline for a non-core Activity 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 course

Absences from Final Examinations

If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as

Professionalism & Privacy

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