BIOL 330 / ES 344 University of Victoria – Spring 2021
STUDY DESIGN AND DATA ANALYSIS

Instructor Dr. Terri Lacourse – tlacours@uvic.ca
Office hours: on Zoom by appointment
Lab Instructor Dr. Neville Winchester – winchest@uvic.ca
Course website BIOL 330 / ES 344 on bright.uvic.ca
Lectures Tuesdays, Wednesdays, Fridays at 11:30 AM–12:20 PM
Labs Tuesdays, Thursdays at 2:30–5:20 PM
Textbook Whitlock, M. & Schluter, D. 2020. The Analysis of Biological Data. **3rd Ed.** Macmillan.
Software R and RStudio (available for download at no cost)

Learning Objectives At the end of the course:
1. You are able to frame appropriate and testable hypotheses for a set of data.
2. You are able to analyze and interpret a set of data in a statistically sound way, so that your interpretation will withstand scrutiny as being a logical and appropriate hypothesis test and interpretation of the data.

Assessment of Final Grades

Lab Assignments	40%	Five assignments, each worth 5 or 10%; see pages 2 & 3
Midterm Exam	20%	**Cumulative** and **closed-book**; February 23, 11:30 AM-12:20 PM
Final Exam	40%	**Cumulative** and **closed-book**; During Exam Period: April 15-27

Important Notes & Course Policies (*see page 3 for additional Policies that relate to the Lab*)

1) This is an online course. Students are responsible for having a reliable computer and internet connection for lectures, labs, assignments and exams. Refer to the **University's minimum technology requirements for online courses**: www.uvic.ca/systems/status/features/min-tech-requirements.php

2) Live sessions may be recorded by the Instructors and posted on the course website. Students are not permitted to record lecture or lab sessions in audio or video formats.

3) A lockdown browser and Zoom may be required for exams. If so, advance notice will be given.

4) No supplemental exams will be offered. If you miss the midterm exam (due to an emergency or medical reason with original documentation), then the final exam grade will be used in place of the missed exam in the final grade assignment.

5) As per University regulations, students who do not complete all tests and assignments will be given a final grade of **N** and will not be permitted to write the final exam.

6) As per University regulations, students must achieve satisfactory standing in both the lecture and the lab. To receive credit for the course, students must pass both the lecture and the lab.

7) Final grades will be assigned on the basis of the University's official grading scale with F and N as per university regulations.

LECTURE SCHEDULE

Week of…	Lecture Topics	Textbook Chapters
Jan 11	Types of data; Random sampling; Displaying Data	1, 2, Interleaf 2
Jan 18	Describing Data; Estimating Uncertainty; Probability	3, 4, 5
Jan 25	Hypothesis testing; Binomial test; χ^2 goodness-of-fit	6, 7, 8, Interleaf 3
Feb 1	Contingency; Normal distribution; Confidence intervals	9, 10
Feb 8	Testing means and variances	11, 12
Feb 15	*Reading Break - No Lectures*	
Feb 22	***Midterm exam February 23;*** Experimental design	14, Interleaf 5 & 6
March 1	Violating test assumptions; Non-parametric tests	13
March 8	ANOVA	15
March 15	Correlation; Regression	16, 17, Interleaf 1
March 22	General linear models; ANCOVA	18
March 29	Computer-intensive methods; Meta-analysis ***No class April 2 (Easter holiday)***	12, 19, Interleaf 10 & 11
April 5	Knowing which statistical test to use; Review	Interleaf 7

* The exact sequence of lecture topics is subject to revision as the course progresses.

LAB SCHEDULE

Week of…	Lab	Assignment Due Dates
Jan 11	*NO LABS*	
Jan 18	1. Installing R and RStudio	
Jan 25	2. Introduction to R, Part 1	
Feb 1	3. Introduction to R, Part 2	
Feb 8	4. Graphing & Describing Data	**Lab 3 due Monday, February 8 by 1:00 pm PST**
Feb 15	*Reading Break - No Labs*	
Feb 22	5. Analyzing Categorical Data	
March 1	6. Getting Started with Numerical Data	**Lab 5 due Monday, March 1 by 1:00 pm PST**
March 8	7. Comparing Two Groups	
March 15	8. Data Transformation & Non-parametric tests	**Lab 7 due Monday, March 15 by 1:00 pm PST**
March 22	9. ANOVA	
March 29	10. Correlation & Regression	**Lab 9 due Monday, March 29 by 1:00 pm PST**
April 5	*NO LABS*	**Lab 10 due Wednesday, April 7 by 1:00 pm PST**

Lab Grading Scheme *All lab assignments are **individual** (not group) **assignments***

Assignment for Labs 3 and 5	each worth 5%
Assignment for Labs 7, 9 and 10	each worth 10%

Important Notes on the Lab & Lab Policies

1) You are not required to buy a lab manual for this course. All lab materials are available on Brightspace.

2) The focus of the lab is to practice implementation of study design principles and data analysis techniques. We will be using R and RStudio software for data analysis. These programs have become the preferred software for data analysis in biological research. R and RStudio are available for download from the internet, at no cost. Note that R is not 'point & click' software; it requires the user to write computer code to perform statistical analyses. RStudio provides a more user-friendly interface for analyses in R, and the lab materials have been written on the assumption that you will use R through the RStudio interface. You are welcome to use R as a stand-alone program and not run it through RStudio.

3) **All assignments in this course are individual assignments, not group assignments**. All assignments must be the product of each student's individual efforts. Assignments will be monitored for cheating and plagiarism.

4) Students are not permitted to share lab materials including assignments and their answers with others or distribute them in any form e.g., post online or on social media.

5) **Assignments that are submitted late will receive a grade of 0.** There are no late marks for assignments.

6) **All assignments must be completed**. As per University regulations, students who do not complete all assignments will be given a final grade of **N** and will not be permitted to write the final exam.

Academic Integrity & Intellectual Property

The University has a strict Policy on **Academic Integrity**. All students are required to read and abide by this policy: *www.uvic.ca/calendar/undergrad/info/regulations/academic-integrity.html*

All course materials are the intellectual property of the Instructors. Students are not permitted to share or distribute course materials (e.g., lecture videos, slides, labs, assignments, exams, etc.) or post them online or on social media in any form at any time. Failure to comply with this is a violation of the University's policy on Intellectual Property and Copyright law.