Department of Biology Course Outline

BIOL5081 BIOSTATISTICS, FALL 2018

Course Description

Official Calendar Course Description
This course examines common statistical methods used in biology. Data science and statistical workflows are developed. Descriptive statistics, generalized linear models, regression, nonparametric tests, bootstrapping, randomization tests, tree-based analysis, multivariate statistics, and time-series analysis are considered. SPSS and the R programming and software environment will be used for data analysis.

Prerequisites (strictly enforced)

BIOL 2060, previously numbered BIOL 3090 or an undergraduate course in Statistics. Students who have not taken a statistics course within the last three years are required to audit BIOL 2060 lectures.

Course Instructor(s) and Contact Information

Dr. Christopher J. Lortie
218A Lumbers
Telephone: 416-736-2100 ext. 20588
e-mail: lortie@yorku.ca

Dr. Roberto Quinlan
211A Lumbers
Telephone: 416-736-2100 ext. 40076
e-mail: rquinlan@yorku.ca

Schedule

Date and Time: Thursdays: 2:30 - 5:30 p.m.
Location: LSB 101
Course Session: FALL 2018 - Start date: September 6, 2018.
Course ID.: F62E01

Evaluation

Evaluation Components of Final Grade and related information.
Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.

Module 1.
The first 6 weeks are administered by Dr. Lortie

Review	25%
Take-home statistical test/report	25%

Module 2.
The remaining 6 weeks are administered by Dr. Quinlan

Student presentations	30%
Take-home statistical test	20%

Important Dates

September 27th, 2018: Review due to Dr. Lortie
October 25th, 2018: Take-home practical test/reports due to Dr. Lortie

Drop Deadline: Fri. Nov. 9, 2018 (last day to drop without course on transcript)
Course Withdrawal: Sat. Nov. 10 to Dec. 4, 2018 (course still appears on transcript with 'W")

NOTE for instructors: for additional important dates such as holidays, refer to the "Important Dates" section of the Registrar's Website at http://www.yorku.ca/yorkweb/cs.htm

Resources

The New Statistics with R: An Introduction for Biologists by Andy Hector.
Print ISBN-13: 9780198729051
Readings and other online resources including peer-reviewed publications provided in class.

Learning Outcomes

Upon successful completion of this course, students should be able to:
Module 1 by Dr. Lortie. Data science & Fundamental Exploratory Data Analysis in r

1. Build a data model for a graduate-level dataset.
2. Develop a reproducible data and statistical workflow.
3. Design and complete intermediate-level data visualizations appropriate for a graduate-level simple dataset.
4. Complete fundamental exploratory data analysis on any dataset.
5. Appreciate the strengths and limitations of open science, data science, and evidence-based collaboration models.

Module 2 by Dr. Quinlain.

1. Conduct basic and advanced statistical analyses in SPSS.
2. Interpretation of data analyses.
3. Analyze data from your thesis or lab group.

Course Content

All details and code for first model of course will be freely provided online by Dr. Lortie.
Course materials for Dr. Quinlan's portion of the course will be provided via Moodle.

Experiential Education and E-Learning

GitHub, R studio, and R will be used to share code, wrangle data, and do statistics.
SPSS will also be used to conduct a variety of statistical tests.

Other Information

EXPECTATIONS
Attendance is mandatory because the lectures will provide an opportunity for the students not only to listen to summary lectures of the by the professor of statistics but to also engage in the analyses. In the lectures, we will work together to actively handle data and do statistics. All information presented in class is testable. For module 1, both assignments must be submitted to turnitin.com.
Class ID: 18910126
Key: rstats4bio

Course Policies

Alternative dates for assignments/evaluations are not available in this course. If documentation is provided for valid absences on test dates, accommodation will be granted in mutual discussion with the professors. To promote fairness and student responsibility, all in class exercises are due on the dates specified herein. A 20% penalty will be applied for the first day the exercise is late and 5% every day thereafter. Students who anticipate being unable to submit the exercises on the due date are encouraged to submit early. Grades on exercises and exams are not negotiable. Every reasonable action is made to ensure advance reminders are provided and instruction. Thus, the course director should only be contacted if there is calculation or clerical error present. The Document Submission

System must be used to submit all documentation associated with absences.
https://science.apps01.yorku.ca/machform/view.php?id=84113

Students are not allowed to record lectures or lab tutorials using their own devices.

University Policies

Academic Honesty and Integrity

York students are required to maintain the highest standards of academic honesty and they are subject to the Senate Policy on Academic Honesty (http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/). The Policy affirms the responsibility of faculty members to foster acceptable standards of academic conduct and of the student to abide by such standards.

There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve students' research and writing skills, and cope with University life. Students are expected to review the materials on the Academic Integrity website at - http://www.yorku.ca/academicintegrity/

Access/Disability

York University is committed to principles of respect, inclusion and equality of all persons with disabilities across campus. The University provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. These services are made available to students in all Faculties and programs at York University.

Student's in need of these services are asked to register with disability services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Please note that registering with disabilities services and discussing your needs with your professors is necessary to avoid any impediment to receiving the necessary academic accommodations to meet your needs.

Additional information is available at the following websites:
Counselling & Disability Services - http://cds.info.yorku.ca/
Counselling & Disability Services at Glendon - https://www.glendon.yorku.ca/counselling/
York Accessibility Hub - http://accessibilityhub.info.yorku.ca/

Religious Observance Accommodation

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents. Should any of the dates specified in this syllabus for an in-class test or examination pose such a conflict for you, contact the Course Director within the first three weeks of class. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course director immediately. Please note that to arrange an alternative date or time for an examination scheduled in the formal examination periods (December and April/May), students must complete and submit an Examination Accommodation Form at least 3 weeks before the exam period begins. The form can be obtained from Student Client Services, Student Services Centre or online at http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf

Student Conduct in Academic Situations

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and other academic settings, and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. The policy and procedures governing disruptive and/or harassing behaviour by students in academic situations is available at - http://secretariat-policies.info.yorku.ca/policies/disruptive-andor-harassing-behaviour-in-academic-situations-senate-policy/