

Course Outline Form: Winter 2019

General Information

Course Title: STAT*3510 Environmental Risk Assessment

Course Description: Contemporary statistical methods for assessing risk, including dose-response models, survival analysis, relative risk analysis, bioassay, estimating methods for zero risk, trend analysis, survey of models for assessing risk. Case studies illustrate the methods.

Prerequisites: STAT*2050

Credit Weight: 0.5

Academic Department (or campus): Mathematics & Statistics

Campus: University of Guelph

Semester Offering: Winter 2019

Class Schedule and Location: M/W/F 10:30am – 11:20am, CRSC 117

Instructor Information

Instructor Name: Dr. Lorna Deeth

Instructor Email: lddeeth@uoguelph.ca

Office location and office hours: MACN 548. Office hours are M/W/F, 1:00pm – 3:00pm.

Course Content

Specific Learning Outcomes:

This course is designed to give students experience and confidence in the analysis of data related to (non-financial) risk assessment. Students will gain basic practical experience in summarizing, analyzing and interpreting data related to risk assessments using standard statistical methods. At the end of this course students should:

1. Make and interpret visual and numerical summaries of data related to risk assessment.
2. Select the appropriate statistical method for a given data set related to risk assessment.
3. Use appropriate statistical computer software to explore and analyze data related to risk assessment.
4. Understand statistical language as used in the scientific literature on risk.
5. Interpret results of a risk assessment and communicate them to other scientists.

Lecture Content:

The course will cover the following topics, though some components may be assigned for independent study. Additional topics will be covered as time permits.

- Causality/confounding/Simpson's paradox
- Measures of risk
- Hypothesis testing (Chi-squared, Fisher's exact)
- Study designs and invariance of odds-ratios
- Review of linear regression
- Interactions, polynomials and broken stick models in linear regression
- Logistic regression
- Regression of count data (Poisson regression)

- Environmental Risk Assessment
- Survival analysis, left censoring and AFT models
- Individual-level models for infectious diseases (time permitting)
- Cox proportional hazards models (time permitting)

Course Assignments and Tests:

Course Component	Date	Time	Location	Weight
Assignment 1	Friday, February 1	Due by 11:59pm	Online	5% each (Total: 15%)
Assignment 2	Friday, March 8	Due by 11:59pm	Online	
Assignment 3	Friday, March 22	Due by 11:59pm	Online	
In-class Assignments	January 18, February 8, March 1, March 15	Due by 11:20am	In-class	1.25% each (Total: 5%)
Midterm	Friday, February 15	10:30am – 11:20am	CRSC 117	20%
Course Project*	March 29, April 1, April 3, April 5	10:30am – 11:30am	CRSC 117	20%*
Final Exam	Tuesday, April 16	7pm – 9pm	TBA	40%

*See information on Courselink for Course Project details, including exact deadlines and breakdown of grading components.

Course Resources

Required / Recommended Texts: N/A

Other Resources: A set of incomplete lecture notes will be posted on Courselink. It is expected students will have a copy of these notes available, and will fill them in during lectures. Completed lecture notes will not be posted online.

Every attempt will be made to post each set of weekly notes on the preceding Friday, however students are expected to check Courselink regularly for the availability of the notes.

THE LECTURE NOTES ARE FOR INDEPENDENT USE ONLY, AND ARE NOT TO BE RE-DISTRIBUTED IN ANY FORM WITHOUT MY WRITTEN PERMISSION.

R Statistical Software: Students will be using the statistical software program R/RStudio for their course work. R/RStudio is available on the computers in the Science Complex computer labs; however, students may wish to download and install R/RStudio on their personal computers. R/RStudio is freely available, and runs on both Windows and Mac machines. See the information on Courselink for where to obtain R/RStudio.

Course Policies

Communication Policies: My preferred method of communication is in-person or by email. For email communication, you must use your University of Guelph email account. Use STAT*3510 in your subject line, and include your name and student ID number in all correspondence. Emails that do not include a name and ID number, or from non-uoguelph accounts, will not be answered; otherwise, I will try to respond to emails within 3 business days. Please note that only administrative inquiries will be answered via email; questions regarding assignments, course content, etc. will only be answered during office hours or in lecture.

Grading Policies:

Assignments: There will be a total of 3 independent assignments throughout the semester. Assignments will be submitted through the online system Crowdmark, and must be submitted by the specified date and time. Details about how to submit assignments will be posted on Courselink. **No late assignments will be accepted, and late or missed assignments will automatically receive a grade of 0.** Students who cannot complete an assignment for a valid reason should speak with me *before* the assignment deadline, and be prepared to provide appropriate documentation. In this situation, a student's final exam will be reweighted to make up for the missed assignment.

Students are responsible for answering all questions on an assignment, however for some assignments not every question will be marked. Full solutions will be posted on Courselink, and it is your responsibility to review the solutions and evaluate your performance on any unmarked questions.

In-class Assignments: There are 4 in-class assignments, which will be completed in groups and submitted during lecture on the specified dates. Students are expected to be in lecture during these times, and **missed in-class assignments will receive an automatic grade of 0.** Students who miss an in-class assignment date for a valid reason must speak with me within three business days of the missed class. In this situation, the student's final exam will be reweighted to make up for the missed in-class assignment.

Midterm & Final Exam: The midterm will be held in class, and therefore no student should have a conflict with the date or time. If a conflict does exist, **it is your responsibility to resolve it immediately**. Students who miss the midterm for a valid, documented reason (such as a medical illness) must contact me within 3 business days of the missed test and provide the appropriate documentation. In this situation, the student's final exam will be reweighted to make up for the missed test.

The final exam (date, time and location) is scheduled by the Registrar's Office. Students who miss the final exam due to a valid, documented reason must contact their program counsellor for advice on University regulations regarding final exams. These procedures are based on University policy, and are not under the control of the course instructor.

For the midterm, students are permitted **one** double-sided 8.5" x 11" (letter size) reference page, and **two** double-sided 8.5" x 11" (letter size) pages are permitted for the final exam. You are free to write whatever you would like on your reference pages; however, the reference pages **must be handwritten!** For both the midterm and the final exam, students will be allowed a stand-alone calculator, however cell phones and/or laptop computers may not be used as calculators and will be confiscated.

Course Project: The course project will be completed in groups (assigned by the Instructor) and will consist of a written report and class presentation. Class presentations will take place during the last four classes of the semester (March 29, April 1, 3, and 5), and all students are expected to attend all presentations. Detailed information about the course projects will be posted on Courselink later in the semester.

Regrade Request Procedures: In the event a student wishes to have an assignment or test question regraded, the student must submit a **Regrade Request Form** (available on Courselink) within two weeks of the graded work being returned. After two weeks, the grade in question is considered final, and regrade requests can no longer be submitted. Note that in the event a student submits a question for regrading, we (the TA and myself) reserve the right to regrade the entire assignment/test.

Course Policy on Group Work:

Students are encouraged to work together to discuss course content, share ideas, and ask/answer questions. However, unless it is explicitly stated students can submit collaborative work it should be assumed that submitted work must be done **independently**. Completing another student's work, or having another student complete your work, will constitute academic misconduct. In this course, the in-class assignments and course project will be completed in groups. All other assignments and tests must be completed independently.

Course Policy regarding use of electronic devices and recording of lectures:

Electronic recording of classes is expressly forbidden without consent of the instructor. When recordings are permitted they are solely for the use of the authorized student and may not be reproduced, or transmitted to others, without the express written consent of the instructor.

University Policies

Academic Consideration:

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor in writing, with your name, id#, and e-mail contact. See the academic calendar for information on regulations and procedures for Academic Consideration:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Academic Misconduct:

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community, faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring.

University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection. Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Accessibility:

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Centre for Students with Disabilities as soon as possible.

For more information, contact CSD at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the website:

<http://www.uoguelph.ca/csd/>

Course Evaluation Information:

Please see https://mathstat.uoguelph.ca/sites/uoguelph.ca.mathstat/files/public/TeachevaluationformW16_1.pdf

Drop date:

The last date to drop one-semester courses, without academic penalty, is **Friday, March 8, 2019**. For regulations and procedures for Dropping Courses, see the Academic Calendar:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Mental Health Services:

One out of every five students in Canada experiences some sort of mental health issue at some point in their academic career. If you find yourself facing a mental health crisis, or just need to talk to someone, please consider taking advantage of one of the following resources available to University of Guelph students:

Counseling Services: (x53244) is located at Health Services (J.T. Powell Building) and offers individual and group counselling sessions by appointment or walk-in.

Student Support Network: is located in Raithby House (across from the cannon and offers confidential, peer-based, drop-in support.

Good2Talk: ([1-866-925-5454](tel:1-866-925-5454)) is a free, 24/7 student hotline that provides professional counselling and referrals for mental health, addictions and well-being.

Here 24/7: ([1-844-437-3247](tel:1-844-437-3247)) specializes in assessment, referral and appointment booking and is available 24/7 for crisis support.

You are not alone and you will not be judged for asking for help.