

In a nutshell, this course will focus on two topics:

1. Extension of simple and multiple linear regression models including

Random effects

Model Selection and Regularization

Splines and generalized additive models

2. Methods of Bayesian inference including

One and two parameter models

Prior selection

Regression models

Hierarchical models

MCMC

We will focus on the applied aspects of these methods looking at how to fit appropriate models using packages R and how to interpret the output, and avoiding the technical aspects of the computational methods underneath as much as possible. We will also practice writing statistical reports.

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) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining ewBT/F2 11sm1 0 0JETCID uohange. Any r. Any r. Any remaining

STAT 9864A

The overall course grade will be calculated as listed below:

Assignments 75%

Final Project 25% (10% proposal + 15% final report)

Assignments

There will 5 assignments in the course. Each assignment will be based on the material from two computing labs and will require you to analyse data in R using the methods presented to generate and interpret relevant output. Assignments should be submitted as PDF documents created using RMarkdown (or quarto or knitr). The following is a tentative schedule of the assignment due dates and topics:

Assignment #1: January 30

- o Linear Regression and Random Effects
- o Writing: Results

Assignment #2: February 13

- o Spatial Modelling and Cross-Validation
- o Writing: Methods

Assignment #3: Mar 6

- o Shrinkage Methods, PC Regression, and PLS
- o Writing: Conclusions

Assignment #4: Mar 20

o Basis Functions, Regression Splines, and Smoothing Splines

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missed. If you are unable to meet a course requirement due to illness or other serious circumstances, please follow the procedures below.

STAT 4850G

Each assessment in this course is worth more than 10% of the final course grade and so you must provide valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible if you are unable to submit an assignment or the final project on time. Hqt'hwt yi g'lphqto cwlqp. "r rgcug'eqpuwn'yi g'lwpkxgtukv øu'o gf kecn'kmpguu'r qrke { "cv

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf.

The Student Medical Certificate is available at

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

If accommodation is granted then you will be able to submit your assignment or the final project late without penalty. The length of the accommodation will be determined by the academic counsellor.

Assignments that are submitted late without an extension or past the accommodation deadline will be penalized 10% per day. Assignments submitted 5 days past the original due date will receive a grade of 0.

I will provide 3 grace days that may be used for any assignment but not the final project (proposal or report). Please notify me when you wish to use one of your grace days.

STAT 9850B

Please let me know as soon as possible if you are unable to submit work on time.

Assignments that are submitted late without an extension or past the accommodation deadline will be penalized 10% per day. Assignments submitted 5 days past the original due date will receive a grade of 0.

I will provide 3 grace days that may be used for any assignment but not the final project (proposal or report). Please notify me when you wish to use one of your grace days.

7. Accommodation and Accessibility

Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

https://multiculturalcalendar.com/ecal/index.php?s=c-univwo.

Accommodation Policies

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and

cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

 $https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic \\ Accommodation_disabilities.pdf$

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 Accessible Education at

http://academicsupport.uwo.ca/accessible_education/index.html

if you have any