Schulich MEDICINE & DENTISTRY | Western Science

Bachelor of Medical Sciences (BMSc) Program

Department of Epidemiology and Biostatistics

Biostatistics 3110B Multivariable Methods in Biostatistics

Course outline for Winter 2021

Although this academic year might be different, Western University is committed to a **thriving campus**. We encourage you to check out the Digital Student Experience website to manage your academics and well-being. Additionally, the following link provides available resources to support students on and off campus: https://www.uwo.ca/health/.

1. Technical Requirements:

Stable internet connection

Laptop or computer

Working microphone

Working webcam

2. Course Overview and Important Dates:

Delivery Mode	Dates	Time
online	Tuesday and Thursday	**10:30 am – 11:30 am EST**
online	Thursday	**11:30 am – 12:30 pm EST**

*Details about design and delivery of the course are listed below in Section 4

Classes Start	Reading Weeks	Classes End	Study day(s)	Exam Period
January 11	February 13 - 21	April 12	April 13	April 14 - 30

* March 14, 2021 (extended to next business day): Last day to drop a second-term half course or a second-term full course without penalty.

3. Contact Information

Course Coordinator and Instructor	Contact Information
Dr. Yayuan Zhu	yzhu727@uwo.ca

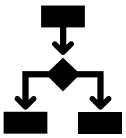
Teaching Assistant(s)	Contact Information
Cheng (Edward) Yu	cyu368@uwo.ca

4. Course Description and Design

This course is designed to provide students with a conceptual understanding of a variety of multivariable regression models that are most often encountered by epidemiologists and biostatisticians in practice. These include multiple linear regression models for continuous outcomes, logistic regression models for binary outcomes, and Cox proportional hazard regression models for time-to-event data, etc. Models will be discussed in the contexts of isolating the effect of a single predictor, understanding multiple predictors, and outcome predictions. Stata and R are primarily used for conducting data analysis and implementing statistical methods in this course.

Prerequisite
Biostatistics 3100A, Epidemiology 3200A or equivalent.

Unless you have either the requisites for this course or written special permission to enroll in it, you may be removed from this course and it will be deleted from your record. Undergraduate students may seek permission from the Undergraduate Chair. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.



Mode	Dates	Time	Frequency
Virtual synchronous	T/Th	10:30 am – 11:30 am	weekly
Virtual synchronous	Th	11:30 am – 12:30 pm	weekly

☒ Attendance at synchronous sessions is required
☒ Missed work should be completed within 48 hours

All course material will be posted to OWL: http://owl.uwo.ca. Any changes will be indicated on the OWL site and discussed with the class.

If students need assistance, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

Google Chrome or Mozilla Firefox are the preferred browsers to optimally use OWL; upyou're your browsers frequently. Students interested in evaluating their internet speed, please click here.

5. Learning Outcomes

Upon successful completion of this course, students will be able to:

- depict and characterize the associations among variables
- understand the underlying mechanisms of various statistical models
- apply appropriate statistical methods to analyze data appearing in practice and report results scientifically
- use statistical software to carry out analysis
- interpret your results and present your findings to statisticians and non-statisticians

6. Course Content and Schedule

Week	Dates	Topic	Text Chapters
1	January 11-17	• Introduction • Exploratory and Descriptive Methods	1-2
2	January 18-24	• Basic Statistical Methods (Assignment 1 due)	3
3	January 25-31	• Basic Statistical Methods (cont) • Linear Regression (Assignment 2 due)	3 4
4	February 1-7	• Linear Regression (cont) (Assignment 3 due)	4
5	February 8-14	• Linear Regression (cont) (Assignment 4 due)	4
6	February 15-21	Reading Week	
7	February 22-28	• Logistic Regression	5
8	March 1-7	• Logistic Regression (cont) (Assignment 5 due)	5
9	March 8-14	• Generalized Linear Models • Midterm Test	8 1-5 and 8
10	March 15-21	• Generalized Linear Models (cont) • Survival Analysis (Assignment 6 due)	8 6
11	March 22-28	• Survival Analysis (cont) (Assignment 7 due)	6
12	Mar 29 - Apr 4	• Final Project Presentation	
13	Apr 5 - Apr 11	• Final Project Presentation	
14	Apr 12 - Apr 18	• Final Report Due	

7. Online Participation and Engagement

☒ Students are expected to participate and engage with content as much as possible

☒ Students can also participate by interacting in the forums with their peers and instructors

8. Evaluation

Below is the evaluation breakdown for the course. Any deviations will be communicated.

Assessment	Weighting	Due Date
Written assignments	35%	posted
Lab assignments	10%	TBA
Mid-term test	30%	posted
Final project	25%	posted

☒ All assignments are due at 11:55 pm EST unless otherwise specified

☒ Assignments, test, and final project will be submitted to OWL

☒ Assignments will be marked by TA; midterm test and final project will be marked by instructor

☒ Midterm exam will be an open book exam and should be returned within 3 hours

☒ After an assessment is returned, students should wait 24 hours to digest feedback before contacting their evaluator; to ensure a timely response, reach out within 7 days

☒ Final project is composed of a written report, oral presentation and participation in discussion

☒ Final project should be collaboration involving 3 students (permission is required from instructor to include 4 students as a group)

Click here for a detailed and comprehensive set of policies and regulations concerning examinations and grading. The table below outlines the University-wide grade descriptors.

A+	90-100	One could scarcely expect better from a student at this level
A	80-89	Superior work which is clearly above average
B	70-79	Good work, meeting all requirements, and eminently satisfactory
C	60-69	Competent work, meeting requirements
D	50-59	Fair work, minimally acceptable
F	below 50	Fail

Information about late or missed evaluations:

☒ Late assessments without self-reported absences will be subject to a late penalty 50%/day

☒ Late assessments with self-reported absences should be submitted within 24 hours of the end of the 48-hour period

☒ An assessment cannot be submitted after it has been returned to the class

9. Communication:

☒ Students should check the OWL site every 24 – 48 hours

☒ Updates may be provided on the OWL announcements

☒ This course will use the OWL forum for discussions; forum discussion is encouraged but not mandatory

☒ Students should post all course-related content on the discussion forum so that everyone can access answers to questions

☒ The discussion forums will be monitored daily by instructors or teaching assistants

10. Office Hours:

☒ Group Office hours will be held weekly [remotely using Zoom, time TBA]

11. Resources

☒ Courses resources (e.g., slides, assignments, test, etc.) will be posted in OWL

☒ Required textbook: Vittinghoff, Glidden, Shiboski, McCulloch (2012) **Regression Methods in Biostatistics: Linear, Logistic, Survival, and Repeated Measures Models (2nd ed)**. Springer

(PDF available from Western library)

☒ Required software:

Stata can be accessed via MyVLab (https://myvlab.uwo.ca/), or a 6 months student license (highly recommended) can be purchased with the price of $48 USD from

https://www.stata.com/order/new/edu/profplus/student-pricing/

R is free and can be downloaded from https://www.r-project.org/

☒ Additional resources:

- Acock, A. C. (2018). A gentle introduction to Stata (6th ed). Stata press.
- Braun, W. J., & Murdoch, D. J. (2007). A first course in statistical programming with R. Cambridge University Press.
- Kleinman, K., & Horton, N. J. (2014). SAS and R: Data management, statistical analysis, and graphics (2. ed). Boca Raton, FL: Chapman Hall/CRC.
- Quick-R: https://www.statmethods.net/

12. Professionalism & Privacy:

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

☒ Students are expected to follow online etiquette expectations provided on OWL

☒ All course materials created by the instructor(s) are copyrighted and cannot be sold/shared

☒ Recordings are not permitted (audio or video) without explicit permission

☒ Permitted recordings are not to be distributed

☒ Students will be expected to take an academic integrity pledge before some assessments

☒ All recorded sessions will remain within the course site or unlisted if streamed

13. How to Be Successful in this Class:

Students enrolled in this class should understand the level of autonomy and self-discipline required to be successful.

1. Invest in a planner or application to keep track of your courses. Populate all your deadlines at the start of the term and schedule time at the start of each week to get organized and manage your time.
2. Make it a daily habit to log onto OWL to ensure you have seen everything posted to help you succeed in this class.
3. Follow weekly checklists created on OWL or create your own to help you stay on track.
4. Take notes as you go through the lesson material. Treat this course as you would a face-to-face course. Keeping handwritten notes or even notes on a regular Word document will help you learn more effectively than just reading or watching the videos.
5. Connect with others. Try forming an online study group and try meeting on a weekly basis for study and peer support.
6. Do not be afraid to ask questions. If you are struggling with a topic, check the online discussion boards or contact your instructor(s) and or teaching assistant(s).
7. Reward yourself for successes. It seems easier to motivate ourselves knowing that there is something waiting for us at the end of the task.

14. Western Academic Policies and Statements

Absence from Course Commitments

Policy on Academic Consideration for Student Absences

If you are unable to meet a course requirement due to illness or other serious circumstances, you must seek approval for the absence as soon as possible. Approval can be granted either through a **self-reported absence** or via the **Academic Counselling** unit. Students have two self-reports to use throughout the academic year; absence from course commitments including tests, quizzes, presentations, labs, and assignments that are worth 30% or less can be self-reported. Self-reported absences cover a student for 48 hours (yesterday + today or today + tomorrow). Your instructor will receive notification of your consideration; however, you should contact your instructor immediately regarding your absence. Students are expected to submit missed work within 24 hours of the end of the 48-hour period. Please review details of the university's policy on academic consideration for student absences.

If you have used both their self-reported absences or will miss more than 48 hours of course requirements, a Student Medical Certificate (SMC) should be signed by a licensed medical or mental health practitioner and you should contact academic counselling. Academic Counselling will be operating virtually this year and can be contacted at scibmsac@uwo.ca.

Accommodation for Religious Holidays

The policy on Accommodation for Religious Holidays can be viewed here.

Special Examinations

A Special Examination is any examination other than the regular examination, and it may be offered only with the permission of the Dean of the Faculty in which the student is registered, in consultation with the instructor and Department Chair. Permission to write a Special Examination may be given on the basis of compassionate or medical grounds with appropriate supporting documents. To provide an opportunity for students to recover from the circumstances resulting in a Special Examination, the University has implemented Special

Examinations dates. These dates as well as other important information about examinations and academic standing can be found here.

Academic Offenses

"Scholastic offences are taken seriously, and students are directed here to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence.

Accessibility Statement

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Accessible Education (AE) at 661-2111 x 82147 for any specific question regarding an accommodation or review The policy on Accommodation for Students with Disabilities.

Correspondence Statement

The centrally administered **e-mail account** provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner. You can read about the privacy and security of the UWO email accounts here.

Turnitin and other similarity review software

All assignments will be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. Students will be able to view their results before the final submission. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between Western University and Turnitin.com.

15. BMSUE Academic Policies and Statements

Copyright and Audio/Video Recording Statement

Course material produced by faculty is copyrighted and to reproduce this material for any purposes other than your own educational use contravenes Canadian Copyright Laws. You must always ask permission to record another individual and you should never share or distribute recordings.

Rounding of Marks Statement

Across the Basic Medical Sciences Undergraduate Education programs, we strive to maintain high standards that reflect the effort that both students and faculty put into the teaching and learning experience during this course. All students will be treated equally and evaluated based only on their actual achievement. ***Final grades*** on this course, irrespective of the number of decimal places used in marking individual assignments and tests, will be calculated to one decimal place and rounded to the nearest integer, e.g., 74.4 becomes 74, and 74.5 becomes 75. Marks WILL NOT be bumped to the next grade or GPA, e.g. a 79 will NOT be bumped up to an 80, an 84 WILL NOT be bumped up to an 85, etc. The mark attained is the mark you achieved, and the mark assigned; requests for mark "bumping" will be denied.

16. Support Services

The following links provide information about support services at Western University.

Academic Counselling (Science and Basic Medical Sciences)

Appeal Procedures

Registrarial Services

Student Development Services

Student Health Services