

Department of Statistical and Actuarial Sciences

Regression (SS3859A/SS9859A)

Course outline for Fall/Winter 2020



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/>.

Technical Requirements and Important Dates:



Stable internet connection



Laptop or computer



Working microphone



Working webcam



Classes Start	Reading Week	Classes End	Study day(s)	Exam Period
September 9	November 2 - 8	December 9	December 10	December 11 - 22

* November 12, 2020: Last day to drop a first-term half course or a first-term full course without penalty

1. Course Information

Course information

Course Name Regression (SS 3859A/9859A)
 Lecture Hours Monday, Wednesday, Friday 1:30 – 2:30 PM
 Tutorial Hours Monday 2:30 – 3:30 PM

(Note: Tutorial hours will be used for two midterm tests.)

List of Prerequisite(s)

A minimum mark of 60% in Statistical Sciences 2858A/B.

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. 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.

2. Instructor Information



Course Instructor	Contact Information
Hyukjun (Jay) Gweon	hgweon@uwo.ca

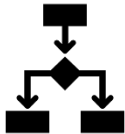
Teaching Assistants	Contact Information
Chelsea Ugenti	cuggenti@uwo.ca
Yishan Zang	yzang8@uwo.ca

Office Hours	Zoom or MS Teams or in Person	Names
Tue 10 – 11 am	Zoom	Chelsea
Wed 10 – 11 am	Zoom	Jay
Thur 3 – 4 pm	Zoom	Yishan

Students must use their Western (@uwo.ca) email addresses when contacting their instructors.

3. Course Syllabus, Schedule, and Delivery Mode

Simple and Multiple linear regression models their use to model data using computing including model specification and assumptions, inference and estimation, use of indicator variables, regression diagnostics, model building and selection. Introduction to Forecasting and Time Series.



Type	Mode	Dates	Time	Frequency
Lecture	Asynchronous online	M/W/F	3 hours	weekly

A pre-recorded video and R codes will be posted three times a week around MWF 1:30 pm.

Table of Contents and Schedule

Below is the planned weekly schedule.



Week	Dates	Topic
1	Sept 9 – 13	Basics of R, Review of hypothesis testing
2	Sept 14 – 20	SRS - LS estimation, MLE, Decomposition of Variation
3	Sept 21 – 27	Sampling Distribution, CI and PI for beta Testing, MLR – estimation
4	Sept 28 – Oct 4	MLR – Inference, Nested model
5	Oct 5 – 11	Categorical Variables, Interaction
6	Oct 12 – 18	Thanksgiving, Model diagnostics
7	Oct 19 – 25	Unusual points – Outlier, Leverage, Influence Transformation
8	Oct 26 – Nov 1	Transformation, Collinearity Variable selection - Measures
9	Nov 2 – 8	Reading Week
10	Nov 9 – 15	Variable selection algorithms Shrinkage methods
11	Nov 16 – 22	Logistic regression – estimation, inference, prediction
12	Nov 23 – 29	Logistic regression Other classification methods Regression for time series data
13	Nov 30 – Dec 6	Regression for time series data Random Walk AR(1), smoothing
14	Dec 7 – 9	Trend, Seasonality Summary

4. Course Materials

The instructor will use his own course notes and R examples.

Textbook (**not required**):

- (a) Introduction to Regression Modeling by B. Abraham and J. Ledolter
- (b) Regression Modeling with Actuarial and Financial Applications by Jed Frees

Software: We will use **R** for this course. Laptop or personal computer with R/RStudio installed is highly recommended.



Students should check OWL (<http://owl.uwo.ca>) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class. Students are responsible for checking OWL on a regular basis.

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; update your browsers frequently. Students interested in evaluating their internet speed, please click [here](#).

5. Methods of Evaluation

The overall course grade will be calculated as listed below:

Assignments	20%
Midterm Tests	30%
Group Project	20%
Final Exam	30%

Assignments

There will be **four homework assignments** (each is worth 5%) during the course. You will be asked to use R to solve most of homework problems. You are required to submit all R codes with the answers.

Midterm Tests

There will be **two written tests** that cover the course material. The dates of the tests are **Oct 5th (Midterm 1)** and **Nov 16th (Midterm 2)**. **Each midterm test** will be worth **15%** of your final grade. The topics covered for each test will be announced later.

Group Project

The project will consist of a group data analysis (at most three students in each group). Students are required to use R for the regression analysis and submit a project report. Detailed instructions will be posted later.

Final Exam

The date of the final exam will be set by the university.

Note: In assignments and tests, there may be additional questions for SS9859A students.

Accommodated Evaluations

- For assignments and tests, late submissions will not be accepted.
- If you have an illness self-report, you must contact the instructor before the due.
- The weight of a missed midterm exam (with an illness self-report) will be transferred to the final exam.
- If the final exam is missed, the student will be asked to take a one-on-one interview style test via Zoom.

Rounding of Marks Statement

Across the 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.

6. Canadian Institute of Actuaries Actuarial Exam Accreditation

This course is accredited under the Canadian Institute of Actuaries (CIA) University Accreditation Program (UAP). Achievement of the minimum required grades in accredited courses may provide credit for preliminary exams. Please note that a combination of courses may be required to achieve exam credit. Details of required courses and grades at Western University are available at: <https://www.cia-ica.ca/membership/university-accreditation-program---home/accredited/uwo>.

In addition to the university’s internal policies on conduct, including academic misconduct, candidates pursuing credits for writing professional examinations shall also be subject to the Code of Conduct and Ethics for Candidates in the CIA Education System and the associated Policy on Conduct and Ethics for Candidates in the CIA Education System. For more information, please visit Obtaining UAP Credits and the CIA FAQ.

Students need both Stats 3859A and Stats 3850B (both with a minimum grade of 80%) in order to be eligible to receive a credit for SOA Exam SRM.

7. Accommodation and Accessibility

Accommodation Policies

Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The Academic Accommodation for Students with Disabilities policy can be found at:

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

Academic Consideration for Student Absence

Students will have up to two (2) opportunities during the regular academic year to use an on-line portal to self-report an absence during the semester, provided the following conditions are met: the absence is no more than 48 hours in duration, and the assessment for which

consideration is being sought is worth 30% or less of the student's final grade. Students are expected to contact their instructors within 24 hours of the end of the period of the self-reported absence, unless noted on the syllabus. Students are not able to use the self-reporting option in the following circumstances:

- for exams scheduled by the Office of the Registrar (e.g., December and April exams)
- absence of a duration greater than 48 hours,
- assessments worth more than 30% of the student's final grade,
- if a student has already used the self-reporting portal twice during the academic year

If the conditions for a Self-Reported Absence are *not* met, students will need to provide a Student Medical Certificate if the absence is medical, or provide appropriate documentation if there are compassionate grounds for the absence in question. Students are encouraged to contact their Faculty academic counselling office to obtain more information about the relevant documentation.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.**

For policy on Academic Consideration for Student Absences - Undergraduate Students in First Entry Programs, see:

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

and for the Student Medical Certificate (SMC), see:

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

Religious Accommodation

Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar:

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

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (see http://www.registrar.uwo.ca/examinations/exam_schedule.html).

8. Academic Policies

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

In accordance with policy, <http://www.uwo.ca/its/identity/activatenonstudent.html>, 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.

All of the remote learning sessions for this course will be recorded.

The data captured during these recordings may include your image, voice recordings, chat logs and personal identifiers (name displayed on the screen). The recordings will be used for educational purposes related to this course, including evaluations. The recordings may be disclosed to other individuals participating in the course for their private or group study purposes. Please contact the instructor if you have any concerns related to session recordings.

Participants in this course are not permitted to record the sessions, except where recording is an approved accommodation, or the participant has the prior written permission of the instructor.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Tests and examinations in this course will be conducted using the remote proctoring service, such as Proctortrack. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide **personal information** (including some biometric data) and the session will be **recorded**. More information about this remote proctoring service is available in the Online Proctoring Guidelines at the following link:

<https://www.uwo.ca/univsec/pdf/onlineproctorguidelines.pdf>

Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. Information about the technical requirements are available at the following link:

<https://www.proctortrack.com/tech-requirements/>

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

Copyright Statement

Please be aware that all course materials created by the instructor(s) are copyrighted and cannot be **sold/shared**. Those include materials used in tests/quizzes, midterms, and finals. Any posting/sharing of such materials in part or whole without owner's consent is considered as violation of the Copyright Act and will be considered as a scholastic offence.

In addition, online services such as Chegg are actively monitored. Any questions that are coming out during midterms and finals and are posted to an online service will be searched. Such an activity will be considered as a scholastic offence and will result in academic penalty.

9. Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on add/drop courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>

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 Student Accessibility Services (SAS) at (519) 661-2147 if you have any questions regarding accommodations.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

Students who are in emotional/mental distress should refer to Mental Health@Western (http://www.health.uwo.ca/mental_health) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, <http://westernusc.ca/services>.