



ADS3864B 570
Data Visualization and Statistical Analysis
Winter 2026

Instructor: Dr. Lori Murray
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Course Information

Mode of Instruction: In Person

Calendar Description:

Statistical programming in a high-level language, data visualization design principles, extracting insights from data visualization, data mining and machine learning, data classification; visualization of multivariate, time-series, and hierarchical data.

Pre-requisite(s): 0.5 course from Analytics and Decision Sciences 2288F/G or Statistics 2864A/B; and 1.0 course from Economics 2122A/B, Economics 2222A/B, Economics 2123A/B, Economics 2223A/B or Analytics and Decision Sciences 2036A/B, Statistical Sciences 2035, Statistical Sciences 2857A/B, Statistical Sciences 2858A/B; or by permission of the School of Management, Economics, and Mathematics.

Extra Information: 3 lecture hours, 2 lab hours.

Course Weight: 0.50

Breadth: CATEGORY A

Subject Code: ADS

Notice: Unless you have either the requisites for this course (fulfilment of pre-requisites, no anti-requisite conflicts), or special permission from your Dean to enrol 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.

KING'S UNIVERSITY COLLEGE
WESTERN UNIVERSITY
ADS 3864B 2025-2026

Instructor & Course Information

Course Instructor: Professor Murray

Email: lori.murray@uwo.ca

Course Description: Statistical programming in a high-level language, data visualization design principles, extracting insights from data visualization, data mining and machine learning, data classification; visualization of multivariate, time-series, and hierarchical data. Currently using R including ggplot2 and other relevant packages.

Prerequisite(s): 0.5 course from [Analytics and Decision Sciences 2288F/G](#) or Statistics 2864A/B; and 1.0 course from [Economics 2122A/B](#), [Economics 2222A/B](#), [Economics 2123A/B](#), [Economics 2223A/B](#) or [Analytics and Decision Sciences 2036A/B](#), [Statistical Sciences 2035](#), [Statistical Sciences 2857A/B](#), [Statistical Sciences 2858A/B](#); or by permission of the School of Management, Economics, and Mathematics.

Course Website

All course materials, content, and schedule related to the course including this course outline can be found on the OWL Brightspace course website. Students are expected to be aware of information and make use of materials posted on the course web site.

Course Textbooks & Software

A selection of open-source resources will be used during the course. All of these resources will be available on OWL Brightspace.

Learning Outcomes:

- Learn accepted design principles and elements for the display of data
- Use visual data analysis to extract insights from data
- Use data visualizations to help tell the story of data
- Handling of large datasets and preparation for analysis and visualization
- Data mining and classification for multivariate data
- Learn machine learning methods (e.g., regression, classification, cluster analysis)
- Visualize and analyze time-series data (noise, autocorrelation) and hierarchical data
- Learn how to create effective data reports

Student Expectations:

- Attend and engage in the course.
- Completion of all assigned work.
- Assumption of complete responsibility to follow-up regarding any assessments which are missed.
- Awareness of items and use of materials posted on the course OWL web site.
- It is up to the student to seek help when needed.

Course Assessments

1. Participation/Attendance

This course grade component will be calculated using attendance and the in-class exercises. In-class exercises will be completed during lectures and will be graded. The in-class exercises must be submitted to OWL Brightspace by the end of the lectures they are assigned. Late submissions will receive a late penalty of 10% per day. Students may miss one in-class exercise for any reason. If a student misses more than one in class exercise, a grade of 0 will be automatically applied to the second and any subsequent missed in class exercises.

NOTE: There are no make-ups for missed participation / attendance /in class exercises for any reason as accommodation is already taken into consideration within the marking scheme.

2. Labs

There will be four graded labs on the following dates:

Lab 1: Jan 14

Lab 2: Jan 28

Lab 3: Feb 11

Lab 4: Mar 4

Details and instructions regarding the labs will be posted on OWL Brightspace. There are no make-ups for the graded labs. If a student misses a graded lab, then the weight of the first missed lab will be reweighted to the midterm test. If a student misses more than 1 lab, then a grade of 0 will automatically be applied to the second and any subsequent missed graded labs.

3. In-class Midterm Test

There will be one in-class closed book test on March 10 at 2:30 pm. The in-class test will be 2 hours and consist of multiple choice, short answer questions, or a combination of both formats. Additional details about the midterm test and topics will be provided in OWL closer to the test. Academic consideration for this midterm test requires submission of formal supporting documentation. Students will be required to obtain academic accommodation approval to write the make-up test.

***NOTE:** Students must write the midterm test to pass this course. If you do not write the midterm test, your maximum grade in this course will be 47% and you will not receive course credit.

4. Final Project

Students will choose an appropriate data set approved by the instructor and will conduct a full analysis using the statistical, modelling and machine learning tools covered in the course. Details will be provided on OWL Brightspace.

The project will be graded on:

- Poster presentation (March 31 2:30 to 5:30 pm at Vitali Lounge)
- Technical quality (appropriate usage of visualization and report analysis)
- Clarity, presentation of report, professionalism in writing

Students will be required to submit a proposal by Mar 17, 2026, for approval of their chosen data set. Students that do not submit a proposal by Mar 20, 2026 at 11:59 pm will receive 0 on their final project. The final version of the final project (to be submitted to OWL) is due on April 2, 2026 at 6:00 pm but will be accepted until April 6 at 6:00 pm without penalty. Projects submitted after April 6, 2026 at 11:59 pm will receive a 20% deduction per day.

Note that instructors reserve the right to seek additional clarification about any submitted work (e.g. explain a solution) as part of any assessment. Students may be asked questions by the instructor regarding their poster presentations and reports.

Evaluation

Your course grade will be determined using the following marking scheme:

- Attendance and graded In-class exercises = 20%
- Graded labs (total 4) = 30%
- Midterm = 30%
- Project / Presentation = 20%

Technology Requirements:

- We will be using R and R Studio. Instructions for downloading and installing the software will be provided on OWL Brightspace.
- Students are required to bring a reliable fully-charged laptop to all lectures and labs (some graded labs may require a programming component).
- It is strongly recommended that you use a Windows PC as there are less issues with the installation of programs and packages. If you experience technical difficulties, please consult King's IT Service: <https://www.kings.uwo.ca/its/services/help-desk/>

Academic Integrity:

- It is expected that all work you submit will be your own.
- Academic integrity policies at Western require that instructors forward to their department chair or director any evidence of academic offenses.
- Cheating is taken seriously to protect the integrity of our measures of your learning.
- 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
- Graded lab assignments, mini-project, and the final project may be subject to similarity review (by hand or by software) to check for unusual coincidences in answer patterns that may indicate cheating.
- Instructors reserve the right to seek additional clarification about any submitted work (e.g. explain a solution) as part of any assessment.

King's is committed to fostering a culture of professionalism, honesty, and academic integrity, and all members of our community—faculty, staff, and students—have a role to play in promoting an ethical learning environment. Furthermore, through the work they submit for academic evaluation, students develop important habits of critical thinking, independent inquiry, and creativity. Thus, it is expected that students will submit work that is truly their own, completed without external assistance (human or artificial) except as explicitly permitted by the course instructor.

Within this course, use of artificial intelligence (AI) tools [such as Chat GPT] is prohibited in all assessments, including labs, essays, examinations, and projects. Unauthorized use of AI will be subject to academic discipline.

Email Communication Policy

Students must use their uwo email address when emailing the instructor so it does not end up in spam and can be verified. Subject line must include ADS 3864B. MEM faculty will endeavor to respond to student emails within 2 business (working) days.

Email communication should be reserved only to provide information or ask a question that requires a very brief response; questions related to the course content (statistics questions) should be communicated during regular office hours or by appointment.

Attendance Policy

Attendance is required! Missing 25% of scheduled classes is considered to be too frequent. A warning email will be issued at the 20% point and if absences continue the instructor will implement the King's attendance policy below:

King's policy states that "A student may be debarred from writing the final exam for failure to maintain satisfactory academic standing throughout the year. Any student who, in the opinion of the instructor, is absent too frequently from class or laboratory periods in any course, will be reported to the Dean of the Faculty offering the course, after due warning has been given*. On the recommendation of the department concerned,

and with the permission of the Dean of that Faculty, the student will be debarred from taking the regular examination in the course.”

* implies that faculty must be tracking and have communicated attendance concerns to student

As the final summative assessment in this course is a final project rather than a final examination, students may be debarred from submitting the final project for failure to maintain satisfactory academic standing throughout the semester. **To maintain satisfactory academic standing throughout the semester, students must attend and engage in at least 75% of the lectures. Students who miss more than 25% of the lectures may be debarred from submitting their final project and presentation.**

Intellectual Property Statement

Course content created by a faculty member is considered the faculty member's intellectual property; it should not be distributed, shared in any public domain, or sold by a student or other third party without prior written consent of the faculty member. Sharing, posting, selling or using this material outside your personal use in this course is considered to be an infringement of intellectual property rights.

KING'S UNIVERSITY COLLEGE

GENERAL COURSE POLICIES

2025-2026

1. Academic Accommodations, Consideration for Absences

Academic Accommodation (Accessibility)

Accessibility Services works to ensure that academic programs are accessible to all students, and supports students who may have a condition related to, but not limited to, vision, hearing, mobility, different ways of learning, mental health, chronic illnesses, chronic pain, autism spectrum disorder, ADD/ADHD, and temporary conditions (beyond short-term academic consideration). Accessibility Services provides recommendations for accommodation based on medical documentation or psychological and cognitive assessment. The accommodation policy can be found here [Academic Accommodation for Students with Disabilities](#). Information on Accessibility Services at King's can be found [here](#).

Academic Consideration for Student Absence

If a student is unable to meet a course requirement due to substantial but temporary extenuating circumstances (medical or compassionate), they should follow the procedures below.

In some cases, where instructors have built flexibility into their assessments, this flexibility will already address consideration needs.

Requests for academic consideration should be directed to the Academic Advising Office of your faculty/college of registration. Requests must be made as soon as possible and no later than 48 hours after the missed assessment.

As a rule, documentation is required for academic consideration. For academic consideration requests on medical grounds, the Student Medical Certificate is available at https://www.kings.uwo.ca/kings/assets/File/currentStudents/courses_enrollment/exams_and_tests/SMC-Feb-2025.pdf.

Students are permitted one academic consideration request without supporting documentation per term per course.

Instructors may designate one assessment per half-course weight as requiring formal supporting documentation. Please refer to the course outline for each course.

For further information, please see:

https://uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf

Absences from Final Examinations

If you miss the Final Exam, contact the Academic Advising Office of your faculty/college of registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a “Multiple Exam Situation” (e.g., more than 2 exams in 23-hour period, or more than 3 exams in a 47-hour period).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under [Special Examinations](#)).

Religious Accommodation

Students should consult the University's list of recognized religious holidays, and should give notice in writing to the instructor and Academic Advising Office if a course requirement will be affected by a religious holiday/observance. Notice must be given as early as possible, and no later than two weeks prior to an examination, and one week prior to a midterm test date. It is the responsibility of such students to inform themselves concerning the work done in classes from which they are absent and to take appropriate action.

2. Support Services

Accessibility, Counselling and Student Development at King’s University College:

<https://www.kings.uwo.ca/current-students/student-services/>

Students experiencing emotional or mental health distress can access services at King’s University College: <http://www.kings.uwo.ca/current-students/campus-services/student-support-services/personal-counselling/>

Good2talk is a good online and phone 24/7 resource for students and is available in English, Mandarin, and French: <https://good2talk.ca>, 1-866-925-5454

MentalHealth@Western provides a complete list of options about how to obtain help:

https://www.uwo.ca/health/mental_wellbeing/

Academic Support Services at King’s University College:

<https://www.kings.uwo.ca/current-students/academic-resources/>

GBSV Support:

King’s is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at:

<https://www.kings.uwo.ca/about-kings/safe-campus/gender-and-sexual-violence/>

You can reach someone supports at Kings by emailing Care@kings.uwo.ca or calling 519-930-4640 to reach a social worker who can offer help.

You can also reach Western’s Gender-Based Violence & Survivor Support Case Manager by [email](#) or by calling 519-661-3568.

Further supports can be found on this website: <https://www.kings.uwo.ca/about-kings/safe-campus/gender-and-sexual-violence/>

See also https://www.uwo.ca/health/student_support/survivor_support/get-help.html

University Students' Council offers many valuable support services for students, including the health insurance plan: <http://westernusc.ca/services/>

3. Statement on Use of Electronic Devices

Use of Electronic Devices: Unless explicitly stated otherwise, you are not allowed to have a cell phone, or any other electronic device, with you during tests or examinations. Unauthorized possession of such a device during a test or examination constitutes an academic offence.

Use of Laptops, Tablets, and Smartphones in the Classroom: King's University College at Western University acknowledges the integration of new technologies and learning methods into the curriculum. The use of electronic devices such as laptop computers, tablets, or smartphones can contribute to student engagement and effective learning. At the same time, King's recognizes that instructors and students share jointly the responsibility to establish and maintain a respectful classroom environment conducive to learning.

The use of electronic devices by students during lectures, seminars, labs, etc., shall be for matters related to the course at hand only. Students found to be using electronic devices for purposes not directly related to the class may be subject to sanctions under the Student Code of Conduct; see <https://www.kings.uwo.ca/current-students/student-affairs/code-of-student-conduct1/>

Inappropriate use of electronics (e.g., laptops, tablets, smartphones) during lectures, seminars, labs, etc., creates a significant disruption. As a consequence, instructors may choose to limit the use of electronic devices in these settings. In addition, in order to provide a safe classroom environment, students attending in-person class sessions are strongly advised to operate laptops with batteries rather than power cords.

4. Statement on Academic Offences

King's is committed to academic integrity. Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, is posted at

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

It is expected that students will submit work that is truly their own, completed without external assistance (human or artificial) except as explicitly permitted by the course instructor. Check with your instructor on what tools, including generative AI (ChatGPT, translation tools, grammar-checking tools) are permitted in the course. Because a tool is permitted in one course, that does not mean it is permitted in other courses.

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. 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; see <https://elearningtoolkit.uwo.ca/tools/Originality Reports - TurnItIn.html>.

Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

5. Copyright of Course Material

Lectures and course materials, including PowerPoint presentations, tests, outlines, and similar materials are protected by copyright. Faculty members are the exclusive owner of copyright in those materials they create. Students may take notes and make copies for their own use. Students may not allow others to reproduce or distribute lecture notes and course materials publicly (whether or not a fee is charged) without the express written consent of a faculty member. Unauthorized sharing of class content is subject to academic discipline.

Similarly, students own copyright in their own original papers and exam essays. If a faculty member wishes to post a student's answers or papers on the course website, they should ask for the student's written permission.

6. Use of Recordings

Participants in this course are not permitted to record the sessions, except where recording is an approved accommodation and/or the participant has the prior written permission of the instructor. Unauthorized recording and/or sharing of class content is subject to academic discipline.

7. Policy on Attendance

Any student who, in the opinion of the instructor, is absent too frequently from class or laboratory periods in any course, will be reported to the Dean of the Faculty offering the course, after due warning has been given. On the recommendation of the department concerned, and with the permission of the Dean of that Faculty, the student will be debarred from taking the regular examination in the course.