

SS4844B/SS9544B/MDA9144B Data Analytics Consulting Course Outline – Winter 2024

1. Course Information

- Lectures:** Mondays and Wednesdays from 3:30 – 5:00 pm in Talbot College (TC) 309
- Format:** Not all lectures will follow standard face-to-face instruction. Alternative formats (e.g., active/blended learning activities, seminars, online resources, meeting with external guests) may be used. Note that actively engaging with all course learning materials, regardless of their formats, is essential for achieving learning outcomes.
- Contingency Plan:** Although the intent is for this course to be delivered in person, should any university-declared emergency require some or all of the course to be delivered online, either synchronously or asynchronously, the course will adapt accordingly. The grading scheme will not change. Any assessments affected will be conducted online as determined by the course instructor.
- Online Resources:** Some lectures may be replaced with required online resources. Examples of online resources that may be assigned include, but are not limited to, asynchronous lectures, readings, videos and/or other activities. Students are expected to proactively engage with such content, completing all tasks and readings as they are assigned and be prepared to discuss such material during lectures.
- Important Dates:**
- | | |
|--------------|---------------|
| Jan. 8 | Classes Start |
| Feb. 17 – 25 | Reading Week |
| Apr. 8 | Classes End |
| Apr. 9 – 10 | Study Day(s) |
| Apr. 11 – 30 | Exam Period |
- Prerequisites:** Students must have a background in data modelling and inference, including statistical/model-based and algorithmic methods and the ability to analyze data using R. Additional course-specific prerequisites are as follows:
- SS4844: SS3859A/B with at least 60%. Registration in the fourth year of an Honours Specialization in Data Science/Statistics module.
 - SS9544: Enrollment in a Dept of Statistical & Actuarial Sciences graduate program.
 - MDA9144: Enrollment in the Master of Data Analytics program.

Unless you have either the requisites for this course or written special permission from your Dean's Designate (e.g., Department/Program Counsellors, Science Academic Counselling) 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

Instructor: Dr. Douglas Woolford
Email: dwoolfor@uwo.ca
Office: Western Science Centre (WSC) 221
Phone: 519-661-2111 ext. 88326
Office Hours: As announced in class/on OWL and by appointment.

Email is the best way to contact me. Please use your Western (@uwo.ca) email address. Emails will typically be responded to within one business day. If emailing to request an appointment outside of office hours, please suggest a few options that are listed in your order of preference.

3. Course Description and Learning Outcomes

Calendar Description

An introduction to data analytics consulting in the context of Problem, Plan, Data, Analysis and Conclusion, including interpersonal techniques; communication; teamwork; project management; copyright, intellectual property, compensation and negotiation; robust data analysis; and ethics. A large portion of the course will be conducted in a seminar format with student participation.

Course-Level Learning Outcomes

On successful completion of this course, students shall have:

- Gained first-hand experience in data consulting for a client.
- A working understanding of the data consulting process.
- The ability to ask appropriate questions to identify and characterize the data analytics problem based on a general description of the problem provided by an end-user/collaborating partner and then recommend analytics methods to approach a data modelling solution to the problem.
- The ability to prepare and present reports and presentations to communicate the information gained through the analysis of data in both technical and non-technical language.
- The ability to work productively in team settings using data analytics to solve a problem or investigate a hypothesis.
- A working knowledge of ethics in the context of data analytics, including the following:
 - A familiarity with Statistical Society of Canada's guidelines on ethical practice;

- A familiarity with the concept of data governance;
 - An understanding of the need to practice ethical data analyses; and
 - The ability to recognize situations where ethical analysis practices were not followed.
- An understanding of the components to conduct a robust data analysis and the ability to document an analysis so that it is reproducible.
 - Developed other professional skills that are desirable traits of a successful data analytics professional, such as project management, effectively participating in meetings in a variety of in-person and electronic settings, non-verbal communication, compensation and negotiation.

4. Course Materials

References

There is no assigned textbook for the course. Some supplementary references are listed below. These are not required but are listed here as helpful references that are related to course topics. Additional references/resources will be made available via the course website on OWL, as needed.

- Alley, M. (2003). *The Craft of Scientific Presentations: Critical Steps to Succeed and Critical Errors to Avoid*. Springer.
- Alley, M. (1996). *The Craft of Scientific Writing*. Springer.
- American Psychological Association. (2022). APA Style common reference examples guide. <https://apastyle.apa.org/instructional-aids/reference-examples.pdf>
- American Psychological Association. (2020). *Publication manual of the American Psychological Association* (7th ed.). <https://doi.org/10.1037/0000165-000>
- Cabrera, J., & McDougall, A. (2013). *Statistical Consulting*. Springer.
- Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, and Social Sciences and Humanities Research Council of Canada. (2022). *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans*. <https://ethics.gc.ca/eng/documents/tcps2-2022-en.pdf>
- Derr, J. (2000). *Statistical Consulting: A Guide to Effective Communication*. Duxbury Thomson Learning.
- Fisher, R., Ury, W. L., & Patton, B. (2011). *Getting to Yes: Negotiating Agreement Without Giving In*. Penguin Books.
- Gandrud, C. (2016). *Reproducible Research with R and R Studio*. Chapman and Hall/CRC.
- Kapterev, A. (2011). *Presentation Secrets: Do What You Never Thought Possible with Your Presentations*. John Wiley & Sons.
- Kloppenborg, T. (2014). *Contemporary Project Management*. Nelson Education.
- Peck, R., Haugh, L. D., Goodman, A. (1998). *Statistical Case Studies: A Collaboration Between Academe and Industry*. Society for Industrial and Applied Mathematics.
- Stodden, V., Leisch, F., & Peng, R. D. (Eds.). (2014). *Implementing Reproducible Research*. CRC Press.
- Ury, W. (2007). *Getting Past No: Negotiating in Difficult Situations*. Bantam.

Course Website

Course material will be posted to the course OWL site (<http://owl.uwo.ca>). Students are responsible for checking the course OWL site 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. If you need support consult the [OWL Help page](#). Alternatively, contact the [Western Technology Services Helpdesk](#), who can also be reached by phone at 519-661-3800 or ext. 83800.

Technical Requirements

- A reliable internet connection and a laptop or desktop computer with the capabilities to
 1. Analyze data using modern statistical and machine learning techniques with commonly used data modelling software (e.g., R, Python);
 2. Create electronic reports and presentations; and
 3. Meet remotely using videoconference software such as zoom with a working microphone and webcam.
- Note that [Google Chrome](#) or [Mozilla Firefox](#) are the preferred browsers to optimally use OWL. Remember to update your browsers frequently.

Intellectual Property Statement

Course material developed by your instructor is the intellectual property of the instructor and is made available to students enrolled in this course for their personal use in this course. Sharing, posting or selling this material to third parties (i.e., to people outside of those in this course, or to companies, websites, organizations, associations, etc.) is considered an infringement of intellectual property rights.

5. Methods of Evaluation

The overall course grade will be calculated as listed below:

| Assessment* | Tentative Number and Approximate Timing/Due Date | Submit to | Weight |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------|
| Assignments | Weeks 3, 6, 10 and 11 | OWL Assignments | 20 |
| Assigned Online Forums | Weeks 1, 5, 8, 9 and 12. | OWL Forums | 15 |
| Ethics Module | Weeks 2 and 13 | OWL Assignments | 10 |
| Mock Consulting Situation | These will take place during weeks 11 – 12 (March 18 – 22, and March 25 – 29). Your individual meeting will be scheduled using OWL. | NA – to be held remotely by Zoom | 10 |
| Participation | Ongoing throughout the term. Actively engaging with all course learning materials and activities, regardless of their format—whether in-person or online—is essential for achieving learning outcomes. | NA | 5 |
| Final Report | April 28 | OWL Assignments | 40 |
| TOTAL | | | 100 |

*Details regarding each of the assessment components will be provided on the course's OWL website.

6. Student Absences

Requesting Accommodation

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

Assessments worth less than 10% of the overall course grade: Please contact the instructor to request accommodation in this situation. No medical/supporting documentation will be required.

Assessments worth 10% or more of the overall course grade: For work totaling 10% or more of the final course grade, the procedure you follow depends on whether you are an undergraduate student or a graduate student. The specific procedures for each of these situations are as follows:

Undergraduate Students

You must provide valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible.

For further information, please consult the University's medical illness policy at 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

Graduate Students

You must provide valid documentation for medical-related absences or adequate supporting documentation for non-medical absences.

For medical-related absences, you must provide a Student Medical Certificate (SMC) signed by a licensed medical or mental health professional. The SMC is available online at https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

Note that in all cases, graduate students are required to contact their instructors within 24 hours of the end of the period covered by such documentation to request accommodation.

Accommodated Evaluations

Missed Assessments

- A mark of 0 will be assigned to any missed assessments unless a request for academic accommodation has been approved.
- For any assessments that are missed due to approved accommodation one of the following will occur: an extension to its due date will be given; or the weight will be reassigned within that given method of evaluation; or a make-up assessment will be offered; or the weight will be shifted to another grade component/components. The decision on how to proceed in such a situation will be on a case-by-case basis and is at the discretion of the instructor. If a make-up assessment is missed, a grade of INC may be assigned, and the student may be required to complete the assessment the next time the course is offered.

Late Submissions

- Late submissions of assignments or the ethics module components will be subject to a 20% penalty per day or portion thereof (including weekends and holidays); submissions that are 5 or more days late not be graded.
- Assigned forum posts and replies must be completed prior to the closing of each respective forum. Late forum submissions and/or replies will not be accepted.
- Students are responsible for signing-up for their individual mock consulting situation. Sign-up will be on a first-come-first-served basis. The sign-up process along with a series of possible meeting dates and times will be provided on the course website partway through the term. Students who neglect to sign up for their mock consulting meeting prior to the announced deadline will receive a 30% penalty on this component, provided they contact the instructor within one week of the stated sign-up deadline to make alternative arrangements to complete the mock consulting assessment; otherwise, a grade of 0 will be assigned.
- Late submissions of the final report will not be accepted.

Absences from Final Examinations

If you miss the Final Exam (when applicable), please contact the Academic Counselling office of your Faculty 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, more than 3 exams in a 47-hour period).

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 the 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

8. Academic Policies

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

In accordance with https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf, 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 their official university address is attended to in a timely manner.

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 sites:

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

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

Use of Commercial Plagiarism Detection Software: All required papers (e.g., written assessments, assignments, reports, briefs, etc.) 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. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

Electronic Devices: The use of a cordless, non-programmable, scientific calculator is permitted for any quizzes, the test(s), and the final exam, where applicable. No other electronic devices may be in your possession during quizzes, tests and exams except for this simple scientific calculator.

Generative AI: The use of generative AI can help support learning and the achievement of course learning outcomes. Consequently, you are permitted to use generative AI in this course. However, note that it is not the instructor's intention for the potential use of generative AI to replace or detract from your learning of key knowledge and skills. Consequently, authentic and alternative assessment techniques will be employed to support your learning and the achievement of learning outcomes. When necessary or applicable, specific instructions on the appropriate use of generative AI for a given learning activity or assessment will be provided. In such situations, students not comfortable with the use of generative AI are welcome to discuss their concerns and possible alternatives with the instructor. Finally, please note that if you choose to use generative AI for any learning activity or assessment, you are expected to do so ethically; you must fully disclose and describe what tool(s) were used, providing proper citations; and, you must ensure that all submitted work is in accordance with the student code of conduct and institutional policies related to academic integrity and scholastic offences because you will be accepting responsibility for its output if included in any submitted work.

Privacy: The names of student(s) may be divulged to other members of the class during class activities. Individuals who are concerned about such disclosures should contact the course instructor to identify whether there are any possible alternatives.

Style Guide

A style guide (or manual) is a set of standards for the design and writing of documents that establishes a consistent style that aids in reading comprehension, provides clarity of community, and reduces bias in language. One commonly used example is the APA style guide. This is the style guide we will be using for this course. Additional information about APA style will be posted on the course website. Unless otherwise specified by the instructor, students **are required to employ the APA style guide** in all written assignments. Failure to do so may result in a loss of grades.

Checking Marked Work: In the event of a question regarding a mark or a final grade, students are responsible for retaining and presenting any graded materials that were returned to the student during the term. Students have one week from the date the material was returned in class to report any apparent error in the marking and appeal their grade. No marks will be changed after that time. The instructor reserves the right to remark the entire assessment (e.g., assignment, lab, quiz, test, project, exam, etc.).

Grades: Marks will not be disclosed or discussed by email or telephone. This includes final grades. Students who wish to discuss a grade on an assessment or their final grade in the course are welcome to come see me during my office hours or to contact me to set up an appointment to meet.

9. Support Services

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

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

Western 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.uwo.ca/health/student_support/survivor_support/get-help.html.

To connect with a case manager or set up an appointment, please contact support@uwo.ca.

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 questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (<https://learning.uwo.ca/>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual

support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Western's Writing Support Centre (<http://writing.uwo.ca/>) provides a variety of services to assist students in their writing. This includes both in-person and online services, including (but not limited to) one-to-one advising sessions, online writing assistance, online modules, links to helpful online resources, assistance with presentations, and so on. For more details see their website.

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/>.

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