

## **Selected Topics in Management and Organizational Studies**

### **Data Science**

#### **MOS 2198B 550 (Winter 2021)**

**Instructor:** Aria Teimourzadeh, PhD

**E-mail address:** [ateimour@uwo.ca](mailto:ateimour@uwo.ca)

**Course schedule:** Monday 2:30 PM to 3:30 PM and Wednesday 3:30 PM to 5:30 PM

**Office hours:** By appointment (via Zoom)

---

#### **COURSE DESCRIPTION:**

Data science is the field of study that combines domain expertise, programming skills, and knowledge of mathematics and statistics to extract meaningful insights from data. This course will focus on simultaneously teaching introductory skills needed to collaborate on teams with data scientists, analysts, and other information professionals. Topics include: Database Management, Data Science methods in R/Python, Data Visualization techniques, Machine Learning technique case studies, critical Topics in Big Data and Emerging AI Technologies.

**Course Prerequisite(s):** MOS 2242A/B, or taken concurrently with MOS 2242B

#### **COURSE LEARNING OBJECTIVES**

As a result of this course, students will be able to:

- Build and manage a database
- Develop interdisciplinary skills on how to integrate critical and creative thinking with examples from computational tools.
- Apply analytical techniques to datasets to produce insights for decision making.

#### **DESCRIPTION OF CLASS METHODS**

This course will be offered in the form of asynchronous teaching. The instructor records the lectures in advance and posts them on OWL platform. The course materials including lecture recordings, PPT slides and exercise files will be uploaded in advance. If necessary, the instructor will schedule Zoom meetings and concepts will be discussed live. The students are expected to follow the instructions posted on the course website to submit their weekly assignments before each deadline.

© Instructor generated course materials (e.g., lecture videos, notes, summaries, exam questions, etc.) are protected by law and may not be copied or distributed in any form or in any medium without explicit permission of the instructor. Note that infringements of copyright can be subject to follow up by the University under the Code of Student Conduct and Disciplinary Procedures.

## TEXTBOOKS AND OTHER REQUIRED RESOURCES

Textbook No textbook is required; readings will be assigned from free online resources, e-books or software documentation. However, access to a laptop that has an operating system of Windows 10, Mac OS X, or any common Linux distribution is required to be able to access a bash terminal. Students will be required to code in either R or Python

Course Notes and data files To be found on the course website at <https://owl.uwo.ca>.

## METHOD OF EVALUATION/ASSESSMENT

Weekly Assignments	20%
Midterm Exam	31%
Quiz	14%
Group Assignment	35%

NOTE: The content and/or evaluation scheme in this course is subject to change.

## SPECIAL INSTRUCTIONS, IF ANY

Students must pay attention to e-mails and announcements in OWL related to the special assignment/reading/exercises.

## COURSE POLICIES

### ➤ Assignments & tests

- Always make sure you have a backup of your assignments and of your test.
- Late submissions **will not be accepted** and **no mark will be given** after the deadlines.
- If you are not satisfied with the grading of an assignment or test, you may request a review **within 1 week of grade posting**.
  - Indicate in writing where and why you feel the marks are unjustified and give it back to the instructor for re-grading.
  - Note that the entire assignment will be re-graded and your grade can go up or down (or stay the same).

If you are to miss a test, you must report this as soon as possible to your instructor. It will be up to the instructor to decide an appropriate course of action.

## TENTATIVE SCHEDULE OF CLASSES.

- This schedule and some topics may change – updates are posted to OWL.

Week	Topic
1	Introduction to Data Science
2	Understanding Data Structures
3	Database Management using SQL
4	Database Management using SQL
5	Statistical Analysis and Data Visualization
Spring Reading Week : Saturday, February 13, 2021 to Sunday, February 21, 2021	
6	Statistical Analysis and Data Visualization
7	Review, Midterm Week Midterm exam : <b>March 3 from 3:30 PM to 5:30 PM</b>
8	Introduction to R / Python
9	R / Python for Data Science
10	R / Python for Data Science Online Quiz : <b>March 24 from 3:30 PM to 4:30 PM</b>
11	Topics in Machine Learning, Big Data and AI.
12	Group Presentations (via Zoom)

### Scholastic Offences, Plagiarism and Collusion

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 website:

[http://www.uwo.ca/univsec/handbook/appeals/scholastic\\_discipline\\_undergrad.pdf](http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_undergrad.pdf).

Plagiarism is the submission of work that is in whole or in part someone else's work (including, but not limited to, text, calculations and exhibits), which you claim as your own. Students must write their assignments, essays, reports, exams, etc. in their own words. Whenever students take an idea or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by using proper references such as footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar).

All required case exams and reports may be subject to submission for similarity review to the commercial plagiarism detection software under licence to the University for the detection of plagiarism. All papers submitted 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 in effect between The University of Western Ontario and Turnitin.com ([www.turnitin.com](http://www.turnitin.com)).

## **UNIVERSITY RESOURCES**

The website for the Office of the Registrar is <http://www.registrar.uwo.ca>. Students may also wish to contact Student Development Services at <http://www.sdc.uwo.ca>.



## **Appendix to Course Outlines: Academic Policies & Regulations 2020 - 2021**

### **Prerequisite and Antirequisite Information**

Students are responsible for ensuring that they have successfully completed all course prerequisites and that they have not completed any course antirequisites. Unless you have either the requisites for this course or written special permission from your Dean to enrol in it without them, you may be removed from this course and it will be deleted from your record. If you enrol in this course despite having already taken an antirequisite you may be removed from this course and it will be deleted from your record. Removals for these reasons 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 or for having already taken the antirequisites.

### **Conduct of Students in Classes, Lectures, and Seminars**

Membership in the community of Huron University College and Western University implies acceptance by every student of the principle of respect for the rights, responsibilities, dignity and well-being of others and a readiness to support an environment conducive to the intellectual and personal growth of all who study, work and live within it. Upon registration, students assume the responsibilities that such registration entails. The academic and social privileges granted to each student are conditional upon the fulfillment of these responsibilities.

While in the physical classroom or online classroom, students are expected to behave in a manner that supports the learning environment of others. Students can avoid any unnecessary disruption of the class by arriving in sufficient time and ready for the start of the class, by remaining silent while the professor is speaking or another student has the floor, and by taking care of personal needs prior to the start of class. If a student is late, or knows that he/she will have to leave class early, be courteous: enter and leave quietly. Please see the Code of Student Conduct at: [www.huronuc.on.ca/sites/default/files/pdfs/Code%20of%20Student%20Conduct.pdf](http://www.huronuc.on.ca/sites/default/files/pdfs/Code%20of%20Student%20Conduct.pdf).

### **Technology**

It is not appropriate to use technology (such as, but not limited to, laptops, cell phones) in the classroom for non-classroom activities. Such activity is disruptive and distracting to other students and to the instructor, and can inhibit learning. Students are expected to respect the classroom environment and to refrain from inappropriate use of technology and other electronic devices in class.

### **Adding / Dropping Courses**

If you think that you are too far behind to catch up or that your workload is not manageable, you should consult your Academic Advisor. If you are considering reducing your workload by dropping one or more courses, this must be done by the appropriate deadlines. Please refer to the Huron website, <https://huronatwestern.ca/academic-advising> or review the list of official Sessional Dates on the Academic Calendar, available here:

<http://www.westerncalendar.uwo.ca/SessionalDates.cfm>.

You should consult with the course instructor and the Academic Advisor who can help you consider alternatives to dropping one or more courses. Note that dropping a course may affect OSAP and/or Scholarship/Bursary eligibility.

### **Class Cancellations**

In the event of a cancellation of class, every effort will be made to post all relevant information on the OWL class site and on the Huron website at, <https://huronatwestern.ca/about/accessibility>.

### **Attendance Regulations for Examinations**

A student is entitled to be examined in courses in which registration is maintained, subject to the following limitations:

- 1) A student may be debarred from writing the final examination for failure to maintain satisfactory academic standing throughout the year.
- 2) 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. The Dean of the Faculty offering the course will communicate that decision to the Dean of the Faculty of registration.

Please see the policy on Attendance Regulations for Examinations here:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/exam/attendance.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/exam/attendance.pdf).

### **Academic Student Support Services**

For advice on course selections, degree requirements, and for assistance with requests for medical accommodation, students should email an Academic Advisor in Huron's Student Support Services at [huronsss@uwo.ca](mailto:huronsss@uwo.ca). An outline of the range of services offered is found on the Huron website at: <https://huronatwestern.ca/academic-advising>.

Department Chairs, Program Directors and Coordinators are also able to answer questions about individual programs. Contact information can be found on the Huron website at:

<https://huronatwestern.ca/contact/contact-directory>.

### **Copyright Regarding 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. Similarly, students own copyright in their own original papers and exam essays. If a faculty member is interested in posting a student's answers or papers on the course website he/she should ask for the student's written permission.

### **Statement on Academic Integrity**

The International Centre for Academic Integrity defines academic integrity as "a commitment, even in the face of adversity, to five fundamental values: honesty, trust, fairness, respect, and responsibility. From these values flow principles of behaviour that enable academic communities to translate ideals to action." (CAI Fundamental Values Project, 1999).

A lack of academic integrity is indicated by such behaviours as the following:

- Cheating on tests;
- Fraudulent submissions online;
- Plagiarism in papers submitted (including failure to cite and piecing together unattributed sources);
- Unauthorized resubmission of course work to a different course;
- Helping someone else cheat;
- Unauthorized collaboration;
- Fabrication of results or sources;
- Purchasing work and representing it as one's own.

### **Academic Integrity: Importance and Impact**

Being at university means engaging with a variety of communities in the pursuit and sharing of knowledge and understanding in ways that are clear, respectful, efficient, and productive. University communities have established norms of academic integrity to ensure responsible, honest, and ethical behavior in the academic work of the university, which is best done when sources of ideas are properly and fully acknowledged and when responsibility for ideas is fully and accurately represented.

In the academic sphere, unacknowledged use of another's work or ideas is not only an offence against the community of scholars, it is also an obstacle to academic productivity. It may also be understood as fraud and may constitute an infringement of legal copyright.

A university is a place for fulfilling one's potential and challenging oneself, and this means rising to challenges rather than finding ways around them. The achievements in an individual's university studies can only be fairly evaluated quantitatively through true and honest representation of the actual learning done by the student. Equity in assessment for all students is ensured through fair representation of the efforts by each.

Acting with integrity at university constitutes a good set of practices for maintaining integrity in later life. Offences against academic integrity are therefore taken very seriously as part of the university's work in preparing students to serve, lead, and innovate in the world at large.

A university degree is a significant investment of an individual's, and the public's, time, energies, and resources in the future, and habits of academic integrity protect that investment by preserving the university's reputation and ensuring public confidence in higher education.

**Students found guilty of plagiarism will suffer consequences ranging from a grade reduction, to failure in the course, to expulsion from the university. In addition, a formal letter documenting the offence will be filed in the Dean's Office, and this record of the offence will be retained in the Dean's Office for the duration of the student's academic career at Huron University College.**

### **Statement on Academic Offences**

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, as per the Academic Calendar: [http://www.westerncalendar.uwo.ca/PolicyPages.cfm?PolicyCategoryID=1&Command=showCategory&SelectedCalendar=Live&ArchiveID=#SubHeading\\_189](http://www.westerncalendar.uwo.ca/PolicyPages.cfm?PolicyCategoryID=1&Command=showCategory&SelectedCalendar=Live&ArchiveID=#SubHeading_189) .

### **Turnitin.com**

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. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<https://www.turnitin.com/>).

### **Computer-Marked Tests/exams**

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.

### **Clickers**

Personal Response Systems (“clickers”) may be used in some classes. If clickers are to be used in a class, it is the responsibility of the student to ensure that the device is activated and functional. Students must see their instructor if they have any concerns about whether the clicker is malfunctioning. Students must use only their own clicker. If clicker records are used to compute a portion of the course grade:

- the use of somebody else’s clicker in class constitutes a scholastic offence
- the possession of a clicker belonging to another student will be interpreted as an attempt to commit a scholastic offence.

### **Academic Accommodation for Students With Disabilities**

Students who require **special** accommodation for tests and/or other course components must make the appropriate arrangements with the Student Development Centre (SDC). Further details concerning policies and procedures may be found at: <http://academicsupport.uwo.ca/>.

Please review the full policy at,

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic%20Accommodation\\_disabilities.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic%20Accommodation_disabilities.pdf).

### **Academic Consideration for Missed Work**

Students who are seeking academic consideration for missed work during the semester may submit a self-reported absence form online provided that the absence is 48 hours or less and the other conditions specified in the Senate policy at

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic\\_Consideration\\_for\\_absences.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf) are met.

Students whose absences are expected to last longer than 48 hours, or where the other conditions detailed in the policy are not met (e.g., work is worth more than 30% of the final grade, the student has already used 2 self-reported absences, the absence is during the final exam period), may receive academic consideration by submitting a Student Medical Certificate (for illness) or other appropriate documentation (for compassionate grounds). The Student Medical Certificate is available online at

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf) .



All students pursuing academic consideration, regardless of type, must contact their instructors no less than 24 hours following the end of the period of absence to clarify how they will be expected to fulfill the academic responsibilities missed during their absence. **Students are reminded that they should consider carefully the implications of postponing tests or midterm exams or delaying submission of work, and are encouraged to make appropriate decisions based on their specific circumstances.**

Students who have conditions for which academic accommodation is appropriate, such as disabilities or ongoing or chronic health conditions, should work with Accessible Education Services to determine appropriate forms of accommodation.

### **Requests for Academic Consideration Using the Self-Reported Absence Form**

Students who experience an unexpected illness or injury or an extenuating circumstance (48 hours or less) that is sufficiently severe to temporarily render them unable to meet academic requirements (e.g., attending lectures or labs, writing tests or midterm exams, completing and submitting assignments, participating in presentations) should self-declare using the online Self-Reported Absence portal. This option should be used in situations where the student expects to resume academic responsibilities within 48 hours or less.

Please note the following conditions that are in place for self-reporting or medical of extenuating circumstances:

- Students will be allowed a **maximum of two self-reported absences** between September and April and one self-reported absence between May and August;
- Any absences in excess of the number designated in clause a above, regardless of duration, will require students to present a [Student Medical Certificate \(SMC\)](#), signed by a licensed medical or mental health practitioner, detailing the duration and severity of illness, or appropriate documentation supporting extenuating circumstances to the Academic Counselling unit in their Faculty of registration no later than two business days after the date specified for resuming responsibilities.
- Self-reported absences will not be allowed for scheduled final examinations; for midterm examinations scheduled during the December examination period; or for final lab examinations scheduled during the final week of term.
- Self-reporting may not be used for assessments (e.g. midterm exams, tests, reports, presentations, or essays) worth more than 30% of any given course.
- Students must be in touch with their instructors **no later than 24 hours after the end of the period covered by the Self-Reported Absence form**, to clarify how they will be expected to fulfil the academic expectations they may have missed during the absence.

Please review the full policy at,

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/accommodation\\_illness.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf) .

### **Policy on “Academic” Accommodation - Medical / Non-Medical Grounds**

- (a) **Medical Grounds** for assignments *worth 10% or more of final grade*: Go directly to Huron Support Services/ Academic Advising, or email [huronsss@uwo.ca](mailto:huronsss@uwo.ca) .

University Senate policy, which can be found at,

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/accommodation\\_medical.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf) , requires that all student requests for accommodation on medical grounds for assignments worth 10% or more of the final grade be made directly to the academic advising office of the home faculty (for Huron students, the “home faculty” is Huron), with supporting documentation in the form



(minimally) of the Senate-approved Student Medical Certificate found at:  
[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf) .

The documentation is submitted in confidence and will not be shown to instructors. The advisors will contact the instructor when the medical documentation is received, and will outline the severity and duration of the medical challenge as expressed on the Student Medical Certificate and in any other supporting documentation. The student will be informed that the instructor has been notified of the presence of medical documentation, and will be instructed to work as quickly as possible with the instructor on an agreement for accommodation.

The instructor will not normally deny accommodation where appropriate medical documentation is in place and where the duration it describes aligns with the due date(s) of assignment(s). Before denying a request for accommodation on medical grounds, the instructor will consult with the Dean. The instructor's decision is appealable to the Dean.

**(b) Accommodation on Medical Grounds for assignments worth *less than 10%* of final grade: Consult Instructor Directly**

When seeking accommodation on medical grounds for assignments worth less than 10% of the final course grade, the student should contact the instructor directly. The student need only share broad outlines of the medical situation. The instructor **may** require the student to submit documentation to the academic advisors, in which case she or he will advise the student and inform the academic advisors to expect documentation. The instructor may not collect medical documentation. The advisors will contact the instructor when the medical documentation is received, and will outline the severity and duration of the medical challenge as expressed on the Student Medical Certificate and in any other supporting documentation. The student will be informed that the instructor has been notified of the presence of medical documentation, and will be instructed to work as quickly as possible with the instructor on an agreement for accommodation.

The instructor will not normally deny accommodation where appropriate medical documentation is in place and where the duration it describes aligns with the due date(s) of assignment(s). Before denying a request for accommodation on medical grounds, the instructor will consult with the Dean. The instructor's decision is appealable to the Dean.

**(c) Non-Medical Grounds: Consult Huron Support Services/ Academic Advising**

Where the grounds for seeking accommodation are not medical (e.g. varsity sports, religious, compassionate, bereavement) the student should contact an academic advisor directly. All accommodation requests must include a completed [Accommodation Request Form](#). Late penalties may apply at the discretion of the instructor.

Where a student seeks accommodation on non-medical grounds where confidentiality is a concern, the student should approach an academic advisor with any documentation available. The advisors will contact the instructor after the student's request is received, and will outline the severity and duration of the challenge without breaching confidence. The student will be informed that the instructor has been notified that significant circumstances are affecting or have affected the student's ability to complete work, and the student will be instructed to work as quickly as possible with the instructor on an agreement for accommodation. Before denying a request for accommodation where documentation has been submitted to an academic advisor, the instructor will consult with the Dean. The instructor's decision is appealable to the Dean.

### **Mental Health & Wellness Support at Huron and Western**

University students may encounter setbacks from time to time that can impact academic performance. Huron offers a variety of services that are here to support your success and wellbeing. Please visit <https://huronatwestern.ca/student-life-campus/student-services/wellness-safety> for more information or contact staff directly:

Wellness Services: [huronwellness@huron.uwo.ca](mailto:huronwellness@huron.uwo.ca)

Community Safety Office: [safety@huron.uwo.ca](mailto:safety@huron.uwo.ca)

Chaplaincy: [gthorne@huron.uwo.ca](mailto:gthorne@huron.uwo.ca)

Additional supports for Health and Wellness may be found and accessed at Western through, [www.uwo.ca/uwocom/mentalhealth/](http://www.uwo.ca/uwocom/mentalhealth/).

### **Important Dates & Directory**

For a current and up-to-date list of important dates and campus directories, please visit:

- **Huron – Important Dates:** <https://huronuc.ca/important-dates-and-deadlines>
- **Academic Calendar & Sessional Dates:**  
<http://www.westerncalendar.uwo.ca/SessionalDates.cfm>
- **Huron Directory – Faculty, Staff and Administration:**  
<https://huronuc.ca/index.php/contact/contact-directory>
- **Western Directory – Faculty, Staff and Administration:** <https://www.uwo.ca/directory.html>