McMaster University | DeGroote School of Business

MBA K723 - Fall 2025

BUSADMIN K723
Data Mining and Business Intelligence
Fall 2025 Course Outline

Information Systems Area
DeGroote School of Business
McMaster University

COURSE OBJECTIVE

This course provides students with a comprehensive understanding of how data mining (DM), machine learning (ML), and artificial intelligence (AI) are applied across business and societal domains. Through hands-on activities, case analyses, and critical discussions and debate, students will gain the skills needed to identify appropriate AI applications, implement AI projects, and anticipate the evolving role of intelligent systems in organizational and everyday contexts.

INSTRUCTOR AND CONTACT INFORMATION

Course Instructor	Section 01	Section 02
Dr. Keiwan Wind email: windkei@mcmaster.ca Office hours by appointment: **DSB-A202, RJC-232**	**see Avenue** **Mondays** **14:30 – 17:20**	**see Avenue** **Tuesdays** **14:30 – 17:20**
The course website (http://www.avenue.mcmaster.ca) will be the primary mode of information dissemination. Please check it regularly for posts concerning the course.		
Teaching Assistant		
Emad Salehi (Assignment Two)	**email: deilamse@mcmaster.ca**	

Course Elements

Credit Value:	3	Leadership:	Yes	IT skills:	Yes	Global view:	Yes
Avenue:	Yes	Ethics:	Yes	Numeracy:	Yes	Written skills:	Yes
Participation:	Yes	Innovation:	Yes	Group work:	Yes	Oral skills:	Yes
Evidence-based:	Yes	Experiential:	Yes	Final Exam:	No	Guest speaker(s):	Yes

Course Description

Data mining, machine learning, and artificial intelligence are no longer futuristic tools—they are embedded in daily life and organizational decision-making. From redefining research methods to transforming industries, AI technologies are reshaping the way we work, live, and innovate. This course offers a high-level yet practical introduction to these technologies, with an emphasis on machine learning. Students will engage with a range of teaching methods, including lectures, readings, hands-on coding, and case-based discussions. The course critically explores the use of AI through managerial, technical, statistical, ethical, and societal lenses.

Learning Outcomes

By the end of the course, students will be able to:

- Identify organizational problems that AI, ML, or DM can/should (or can't/shouldn't) solve, and select appropriate approaches for each.
- Define the critical success factors for implementing successful data-driven projects in organizations.
- Evaluate the effectiveness of DM, ML, and AI solutions for specific business problems.
- Design and plan AI/ML/DM projects aligned with organizational capabilities and stakeholder interests.
- Adapt machine learning algorithms to solve real-world problems in marketing, finance, HR, and other domains.
- Act as informed decision-makers and advocates for responsible AI adoption.
- Analyze potential risks, biases, and unintended consequences of AI initiatives.
- Prepare for a future shaped by continuous and rapid advancements in AI and data science.

Required Course Materials and Readings

Avenue registration for course content, readings and case materials • http://avenue.mcmaster.ca	FREE
Harvard Business School Publishing Course pack (link will be provided within the course website on Avenue to Learn): • Porter, M. E., Davenport, T. H., Daugherty, P., & Wilson, H. J. (2018). HBR's 10 Must Reads on AI, Analytics, and the New Machine Age (with bonus article" Why Every Company Needs an Augmented Reality Strategy" by Michael E. Porter and James E. Heppelmann) (ISBN-13: 978-1633696846)	Included in course pack
• Davenport, Thomas H., et al. Artificial Intelligence: The Insights You Need from Harvard Business Review. Harvard Business Press, 2019. (ISBN-13: 978-1633697898)	Included in course pack
Top Hat • The link will be provided within the course website on Avenue to Learn	FREE

Optional Course Materials and Readings

Hull, J. (2021). Machine learning in business: An introduction to the world of data science. (ISBN-13: 979-8508489441)	29.00 CAD on Amazon.ca
Shmueli, G., Bruce, P. C., Gedeck, P., & Patel, N. R. (2019). *Data mining for business analytics: concepts, techniques and applications in Python*. John Wiley & Sons. (ISBN-13: 978-1119549840)	188.95 CAD on Amazon.ca
Knaflic, C. N. (2015). *Storytelling with data: A data visualization guide for business professionals*. John Wiley & Sons. ISBN-10: 1119002257	37.75 CAD on Amazon.ca
Sterman, J. (2002). *System Dynamics: systems thinking and modeling for a complex world*. Mc Graw Hill. ISBN-10: 9780071068123	48.55 CAD on Amazon.ca
Warren, K. (2015). *Strategy dynamics essentials*. London, UK: Strategy Dynamics Limited. ISBN-10: 1505809053	24.00 CAD on Amazon.ca
Material that guest-speakers will recommend.	Free

EVALUATION

Learning in this course results primarily from in-class discussion and participation of comprehensive business cases as well as out-of-class analysis. The balance of the learning results from the lectures on concepts, from related readings, discussions and debates, researching your presentations, cases, assignments, simulation decisions and projects. All work will be evaluated on an individual basis except in certain cases where group work is expected. In these cases, group members will share the same grade adjusted by peer evaluation. Your final grade will be calculated as follows:

COMPONENTS AND WEIGHTS

Component		Weight
Two assignments (*Individual*)	Due on Week 07) Unsupervised Learning (10%)	25%
	Due on Week 10) Social Network Analysis (15%)	
Ten weekly in-Class Reading Quizzes each 1%		10%
Final assignment (*In-group*)	Due on Week 04) Final Project Concept: 5%	35%
	Due on Week 08) Final Project Literature Review: 10%	
	Due on Week 13) Final Project Report/Presentation: 20%	
Class participation (*Individual*)		20%
Group Debates (*In-group*)		10%
Total		**100%**
Individual assignments = 55%, Group assignments = 45%		

NOTE: The use of a McMaster standard calculator is allowed during examinations in this course. See McMaster calculator policy at the following URL:

www.mcmaster.ca/policy/Students-AcademicStudies/UndergraduateExaminationsPolicy.pdf

GRADE CONVERSION

At the end of the course your overall percentage grade will be converted to your letter grade in accordance with the following conversion scheme:

Passing Grades				Failing Grades	
Letter Grade	**Percent**	**Letter Grade**	**Percent**	**Letter Grade**	**Percent**
A+	**90-100**	**B+**	**75-79.99**	**F**	**0-59.99**
A	**85-89.99**	**B**	**70-74.99**		
A-	**80-84.99**	**B-**	**60-69.99**		

COURSE DELIVERABLES

1) ASSIGNMENTS (INDIVIDUAL-25%)

Two assignments have been designed to provide students with hands-on experience in data analytics and machine learning algorithms. **These assignments constitute 30% of your final grade and will be evaluated individually.** You will receive several datasets and be tasked with completing Python codes for various data analytics or machine learning algorithms. **Weekly course outlines will include essential Python tutorials, though prior experience with Python programming is recommended.**

Assignments will include:

- **Assignment 1**: Clustering techniques applied to market segmentation or international investment data.
- **Assignment 2**: Social network analysis to assess the impact of an intervention on relationship structures.

All assignment submissions must be uploaded to your Avenue account following the instructions provided with each assignment. Only the most recent version submitted will be graded. **Late submissions will be accepted with a penalty of 10% deducted for each day past the due date.** It is the student's responsibility to ensure assignments are submitted before the deadline. Note that you can upload work-in-progress to Avenue – only the last version uploaded before the deadline will be graded.

2) IN-CLASS QUIZZES BASED ON REQUIRED READINGS (INDIVIDUAL)

In sessions with assigned readings, there will be short, in-person quizzes to ensure engagement with the material. Each quiz will include 3–5 multiple-choice or true/false questions. Students are expected to complete the readings beforehand and come prepared to actively participate in class discussions.

3) CLASS PARTICIPATION AND DISCUSSIONS

Students are encouraged to engage actively in discussions related to the material being presented by the instructor and TAs. It is very important that you prepare for each class. Debate and challenge are important activities that help in the learning process, and the willingness of students to engage in such activities is appreciated. Discussions may emerge from assigned readings, lecture topics, or structured in-class activities such as debates and workshops. Name cards and class pictures are used to help give credit for

your participation. You must have a name card with your **full first and last name** clearly written and displayed in front of you for every class.

4) Debates

Students will participate in structured debates where teams represent opposing sides on critical AI topics. Each debate lasts 30 minutes and includes real-time audience engagement (fact-checking, points of information). Grading breakdown:

- **Win Bonus** – 2.5%
- **Content & Argumentation** – 5.0%
- **Delivery, Interaction & Professionalism** – 2.5%

5) Group Project: AI Grant Application for a Social Cause

Overview:
Teams choose a real problem, map causes, and propose one AI action to improve outcomes. Show evidence, risks, and impact. Optional bonus: build a simple simulation to test your idea. Project deliverables will be:

Phase 1) Problem Identification (5%). In a two-page, evidence-based brief, your team selects a wicked economic, social, or environmental problem and defines a tight scope (place, population, time horizon). Show why it matters for business and society and include a simple trend chart (with cited data) to depict how the problem is evolving. Map key stakeholders and sketch an initial system boundary (what's in/out). Note any relevant constraints (policy, budget, equity, ethics). Close with one or two plausible digital touchpoints (e.g., AI, IoT, cloud) that could influence behaviours or information flows. Deliverables: ≤2 pages, one figure, references, and a one-paragraph rationale for feasibility this term.

Phase 2) Literature Review, Interview, Mental Map and Descriptive Model (10%). Teams will produce a ~5-page syntheses that triangulate:

- a focused literature review (at least 10 quality sources),
- one expert interview (append transcript), and
- your team's mental map.

Integrate these into a descriptive model, a clear narrative of how the problem is created and sustained, with explicit system boundary, assumptions, and uncertainties. List measurable variables with units, candidate data sources, and initial KPIs (e.g., service level, emissions, dissatisfaction, cost). Highlight points of disagreement across sources and how you resolved them. In your appendices include mental-map figure, variable/KPI table, and an evidence log linking claims to citations. Use APA for citations.

Phase 3) Causal Loop Diagram, Point of Intervention, and Digital Pulse (20%). Using the descriptive model, build a causal loop diagram (CLD) with at least two reinforcing and two balancing loops, mark delays, and name loops to capture purpose. Identify a high leverage point of intervention and design a digital pulse (a digital transformation action such as ML prediction, optimization, block chain, computer vision, or decision support). Explain the theory of change: which loops the pulse weakens/strengthens, expected direction/magnitude of KPI shifts, required data/actors, timeline, and governance/ethics considerations (privacy, bias, access). Deliverables: 3–4 pages plus the CLD figure, KPI & measurement plan, and a short risk/side-effects section with mitigations.

Bonus Phase) Digital Twin & Validation (+5% optional). Translate your CLD into a minimal stock-and-flow model with dimensionally consistent equations. Calibrate/validate against at least one historical series (or a defensible proxy) and implement the digital pulse as a policy variable. Run baseline vs. intervention scenarios and a simple sensitivity/extreme-case test; report effects on 1–3 KPIs and discuss unintended consequences. Submit model files and a 1-page README for reproducibility. Deliverables: model file(s), 3–4 page appendix with charts and brief commentary, plus the README. This phase is optional; only strong work can add up to +5% to your final course grade.

Note: The submission of the fund allocation report is required to receive the grade for the ad/pitch. This report should detail how the student group allocated their limited budget among the projects presented.

Additional Notes:

- Use university resources and external interviews for comprehensive research.
- If you use Generative AI in your project, report the process: your prompts, AI generated outcomes, your approach to apply these outcomes in your project.
- Final presentations will be evaluated by other groups of students.
- **The final assignment will not be accepted after the due date.**

ACTIVITY	DELIVERY	DESCRIPTION	TOOL(S)
OPENING CONVERSATIONS	In-Person	~25 min	
LECTURE CORE CONTENT/ TUTORIALS	In-Person	~25 min	PPT / JUPYTER NOTEBOOKS
CLASS ACTIVITIES	In-Person	~25 min interactive activities	
READINGS	Asynch	Tied to weekly discussion prompts	Readings from course pack
DISCUSSIONS	In-Person	~25 min live discussion	
QUIZZES	Synch	Based on readings and during class discussion	Tophat
WORKSHOPS	Mixed	~ 25 min in-person, synchronous, Asynchronous session with Instructor or TA	VENSIM: Zoom or In-Person
DEBATES	In-Person	~25 min debate between two teams	

COMMUNICATION AND FEEDBACK

Students that are uncomfortable in directly approaching an instructor regarding a course concern may send a confidential and anonymous email to the respective Area Chair or Associate Dean: http://mbastudent.degroote.mcmaster.ca/contact/anonymous/

Students who wish to correspond with instructors or TAs directly via email must send messages that originate from their official McMaster University email account. This protects the confidentiality and sensitivity of information as well as confirms the identity of the student. Emails regarding course issues should NOT be sent to the Administrative Assistant.

Instructors are encouraged to conduct an informal course review with students by Week #4 to allow time for modifications in curriculum delivery. Instructors should provide evaluation feedback for at least 10% of the final grade to students prior to Week #8 in the term.

ACADEMIC INTEGRITY

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at: www.mcmaster.ca/academicintegrity

Students are responsible for being aware of and demonstrating behaviour that is honest and ethical in their academic work. Such behaviour includes:

- following the expectations articulated by instructors for referencing sources of information and for group work;
- asking for clarification of expectations as necessary;
- identifying testing situations that may allow copying;
- preventing their work from being used by others (e.g., protecting access to computer files); and
- adhering to the principles of academic integrity when conducting and reporting research.

AUTHENTICITY/PLAGIARISM DETECTION

Some courses may use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. A2L, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software.

All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, other software, etc.). For more details about McMaster's use of Turnitin.com please go to www.mcmaster.ca/academicintegrity.

COURSES WITH AN ONLINE ELEMENT

All courses use some online elements (e.g. e-mail, Avenue to Learn (A2L), LearnLink, web pages, capa, Moodle, ThinkingCap, etc.). Students should be aware that, when they access the electronic components of a course using these elements, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course.

Students may be required to use the Respondus LockDown Browser and Respondus Monitor. The Respondus LockDown Browser is a downloadable program that allows a student to take an Avenue to Learn quiz in a secure environment. Quizzes can be set to use LockDown Browser or LockDown Browser.

For more details about McMaster's use of Respondus Lockdown Browser please go to https://avenuehelp.mcmaster.ca/exec/respondus-lockdown-browser-and-respondus-monitor/

The available information is dependent on the technology used. Continuation in a course that uses online elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure, please discuss this with the course instructor.

ONLINE PROCTORING

Some courses may use online proctoring software for tests and exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other applications/software during tests or exams. This software may be required to be installed before the test/exam begins.

CONDUCT EXPECTATIONS

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the *Code of Student Rights &*

Responsibilities (the "Code"). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online**.

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx, Teams, or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.

ATTENDANCE

Arriving late or missing class disrupts the learning experience for both you and your peers. Punctuality and attendance are crucial to maintaining a respectful, professional and productive environment for everyone, including our faculty.

Instructors may use Top Hat in their course in a variety of ways, including to capture attendance in their classes. Attendance is recorded by submitting a unique 4-digit code displayed in your physical classroom using your personal device.

MISSED ACADEMIC WORK

MISSED MID-TERM EXAMINATIONS / TESTS / CLASS PARTICIPATION

Please do not use the online McMaster Student Absence Form (MSAF) as this is for Undergraduate students only. The MBA program will not accept an MSAF.

When students miss regularly scheduled term work which contributes 10% or more to the final grade, for legitimate reasons as determined by the Student Experience – Academic Office (SEAO (Student Experience Academic Office)), the activity necessary to compensate for the missed work will be determined by the course instructor. The compensatory activities assigned will vary with the nature of the course and the missed requirement. They include, but are not restricted to, an alternative assignment, a rescheduled midterm exam, or re-weighting the marks for the missed component to other mark components. Documentation explaining such missed work must be provided to the SEAO (Student Experience Academic Office) within five (5) working days of the scheduled date for completion of the work.

Acceptable reasons for missed work, along with the Petition for Missed Term Work and the MBA Student McMaster University Student Health Certificate, can be found on the DeGroote MBA Student website (mbastudent.degroote.mcmaster.ca). Please direct any questions about acceptable documentation to the MBA Academic Advisors (askmba@mcmaster.ca).

University policy states that a student may submit a maximum of three (3) Petition for Missed Term Work per academic year, after which the student must meet with the Director of the program. If term work is missed without an approved reason, students will receive a grade of zero (0) for that component.

Missed Final Examinations

Students must be available for the duration of the posted exam period regardless of their personal exam schedule. This is to ensure student availability throughout the entire exam period in the event that an exam must be rescheduled due to unforeseen circumstances (university closure, power outage, storm policy, etc.). A student who misses a final examination without valid reason will receive a mark of 0 on the examination.

Students who have missed a final exam for a valid reason can apply to the SEAO (Student Experience Academic Office) to write a deferred examination by submitting an Application for Deferring a Final Exam with supporting documentation. The application must be made within five days of the scheduled exam.

The Application for Deferring a Final Exam and the MBA Student McMaster University Student Health Certificate can be found on the DeGroote MBA Current Student website (mbastudent.degroote.mcmaster.ca)

Deferred examination privileges, if granted, are normally satisfied during the examination period at the end of the following semester. In select cases, the deferred examination may be written at a time facilitated by the SEAO (Student Experience Academic Office) (Student Experience Academic Office) and agreed to by the course instructor.

Requests for a second deferral or rescheduling of a deferred examination will not be considered.

Academic Accommodation for Students with Disabilities

Student Accessibility Services (SAS) offers various support services for students with disabilities. Students are required to inform SAS of accommodation needs for course work at the outset of term. Students must forward a copy of such SAS accommodation to the

instructor normally, within the first three (3) weeks of classes by setting up an appointment with the instructor. If a student with a disability chooses NOT to take advantage of an SAS accommodation and chooses to sit for a regular exam, a petition for relief may not be filed after the examination is complete. The SAS website is: http://sas.mcmaster.ca

Use of Test Accommodations at McMaster University Burlington Campus Ron Joyce Centre

Whereas Student Accessibility Services (SAS), on Main Campus, determines all MBA student accommodations, the MBA Faculty Office manages the coordination of accommodations for tests, midterms, and exams at the Ron Joyce Centre in Burlington.

Process for Students

- Students must activate their accommodation(s) (e.g., extra-time, memory aid, etc.) for each upcoming test, midterm, or exam, at least two weeks in advance. Students can do this by emailing their Instructor and the DeGroote MBA SAS scheduling office at DSBSAS@mcmaster.ca. If a student cannot meet this deadline, they should contact DSBSAS@mcmaster.ca to discuss alternative arrangements. The program is committed to exploring flexibilities where possible to support students.
- All tests, midterms, and exams are booked synchronously with the class's start time. Any deviations from the start time (e.g. start earlier than the class to enable completion at the same end time) requires a discussion with their instructor on protocol at the time of accommodation activation.
- Students will leverage the accommodation (e.g., extra-time, memory aid, etc.), in a designated testing room. Rooms will be booked according to the student's SAS accommodation. Unless the accommodation states otherwise, students should expect that they will be writing in a room with other students. One or more invigilators will always be in the room.
- Following the request to activate the accommodation(s), dsbsas@mcmaster.ca will reach out to the student with their test, midterm, or exam details, including the date, time, and room number. As there may be other students writing tests in the room, we ask that students enter the room quietly and leave all personal items at the front of the room.

All policies and procedures, including restroom access, how extra-time is allocated for assessments under Universal Design, and the submission of memory aids in advance, are consistent with those of SAS on Main Campus. The only variance in procedure is communication around, and physical location of, assessment. There is not a dedicated testing space at RJC. Existing classrooms and lecture halls will be used for most testing. All SAS-approved accommodations will be honoured by our staff; however, core testing

elements are not eliminated in alternative testing formats. Students should expect and plan for invigilation, incidental noise, and other potential distractions.

Academic Accommodation for Religious, Indigenous or Spiritual Observances (RISO)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students should submit their request to the SEAO (Student Experience Academic Office) ***normally within 10 working days*** of the beginning of term in which they anticipate a need for accommodation. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

Copyright and Recording

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors.

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

Potential Modification to the Course

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.

Research Using Human Subjects

ONLY IF APPLICABLE

Research involving human participants is premised on a fundamental moral commitment to advancing human welfare, knowledge, and understanding. As a research intensive institution, McMaster University shares this commitment in its promotion of responsible research. The fundamental imperative of research involving human participation is respect for human dignity and well-being. To this end, the University endorses the ethical principles cited in the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans:

http://www.pre.ethics.gc.ca

McMaster University has mandated its Research Ethics Boards to ensure that all research investigations involving human participants are in compliance with the Tri-Council Policy Statement. The University is committed, through its Research Ethics Boards, to assisting the research community in identifying and addressing ethical issues inherent in research, recognizing that all members of the University share a commitment to maintaining the highest possible standards in research involving humans.

If you are conducting original research, it is vital that you behave in an ethical manner. For example, everyone you speak to must be made aware of your reasons for eliciting their responses and consent to providing information. Furthermore, you must ensure everyone understands that participation is entirely voluntary. Please refer to the following website for more information about McMaster University's research ethics guidelines:

http://reo.mcmaster.ca/

Organizations that you are working with are likely to prefer that some information be treated as confidential. Ensure that you clarify the status of all information that you receive from your client. You **MUST** respect this request and cannot present this information in class or communicate it in any form, nor can you discuss it outside your group. Furthermore, you must continue to respect this confidentiality even after the course is over.

Acknowledgement of Course Policies

Your registration and continuous participation (e.g. on A2L, in the classroom, etc.) to the various learning activities of MBA K723 will be considered to be an implicit

acknowledgement of the course policies outlined above, or of any other that may be announced during lecture and/or on A2L. **It is your responsibility to read this course outline, to familiarize yourself with the course policies and to act accordingly.**

Lack of awareness of the course policies **cannot be invoked** at any point during this course for failure to meet them. It is your responsibility to ask for clarification on any policies that you do not understand.

ARTIFICIAL INTELLIGENCE

Students may use generative AI in this course in accordance with the guidelines outlined for each assessment, and so long as the use of generative AI is referenced and cited following citation instructions given in the syllabus. Use of generative AI outside assessment guidelines or without citation will constitute academic dishonesty. It is the student's responsibility to be clear on the limitations for use for each assessment and to be clear on the expectations for citation and reference and to do so appropriately.

COURSE SCHEDULE

TERTULIA AND WICKED (ALMOST EVERY WEEK)

Almost every session will kick off with a lively 25-minute **tertulia** session, an open, lively conversation on a thought-provoking topic (posted within one week in advance on the course website) and wrap up with a hands-on 25-minute workshop. In these workshops, we will get the chance to experiment with digitally simulating **wicked** problems using systems thinking and explore creative ways to design more sustainable and systemic digital interventions.

WEEK DATE	ASSIGNMENT
WEEK 01 MON SEP 08 TUE SEP 09	**Lecture:** A historical, critical and philosophical discussion around science, knowledge, technology, and AI • DMBA[1]_Chapter 01) Introduction. **Quiz and Discussion on Required Reading(s):** • HBRI[2]_08) How Will AI Change Work? Here are Five Schools of Thought **Debate:** Five Schools of Thought
WEEK 02 MON SEP 15 TUE SEP 16	**DUE:** Finalize list of your team members before the class **Lecture:** Statistics, Data Analytics, Machine Learning, and AI • MLB[3]_Chapter 01) Introduction. • DMBA_Chapter 02) Overview of the Datamining Process. **Tutorial:** Jupyter Environment, Python basics and data structure **Quiz and Discussion on Required Reading(s):** • HBRI_01) The Business of Artificial Intelligence • HBRX[4]_01) Artificial Intelligence for the Real World

[1] Shmueli, G., Bruce, P. C., Gedeck, P., & Patel, N. R. (2019). Data mining for business analytics: concepts, techniques and applications in Python. (**optional**)
[2] Davenport, Thomas H., et al. Artificial Intelligence: The Insights You Need from Harvard Business Review
[3] Hull, J. (2021). Machine learning in business: An introduction to the world of data science. (**optional**)
[4] Porter, M. E., Davenport, T. H., Daugherty, P., & Wilson, H. J. (2018). HBR's 10 Must Reads on AI, Analytics, and the New Machine Age

WEEK 03 MON SEP 22 TUE SEP 23	**DUE:** Project Concept Document (5% of final grade) **Lecture/ Tutorial:** Data Visualization and Descriptive Analytics (with Python) • DMBA_Chapter 03) Data Visualization. **Quiz and Discussion on Required Reading(s):** • HBRI_05) Is your company's data actually valuable in the AI era? • HBRI_12) The Future of AI Will Be About Less Data, Not More
WEEK 04&05 MON SEP 29 TUE OCT 07[5]	**RELEASE:** Assignment One (10% of final grade) **Lecture/Tutorial:** Clustering (with Python) • DMBA_Chapter 15) Cluster Analysis. • MLB_Chapter 02) Unsupervised Learning. **Quiz and Discussion on Required Reading(s):** • HBRX_02) Stitch Fix's CEO on Selling Personal Style to the Mass Market
WEEK 05&06 MON OCT 06[6] TUE OCT 14	**Lecture/Tutorial:** Association Rules and Collaborative Filtering (with Python) • DMBA_Chapter 14) Association Rules and Collaborative Filtering. **Quiz and Discussion on Required Reading(s):** • HBRX_04) Marketing in the Age of Alexa
WEEK 07 MON OCT 20 TUE OCT 21	**DUE:** Assignment One (10% of final grade) **Lecture/Tutorial:** Social Network Analysis (with Python) • DMBA_Chapter 19) Social Network Analysis. **Quiz and Discussion on Required Reading(s):** • HBRI_03) Why Companies That Wait to Adopt AI May Never Catch Up?
WEEK 08 MON OCT 27 TUE OCT 28	**DUE:** Final Project Literature Review (10% of final grade) **RELEASE:** Assignment Two (15% of final grade) **Lecture/Tutorial:** Prediction (with Python) • DMBA_Chapter 06) Multiple Linear Regression. • MLB_Chapter 03) Supervised Learning: Linear and Logistic Regression. **Quiz and Discussion on Required Reading(s):** • HBRX_05) Why Every Organization Needs an Augmented Reality Strategy • HBRX_09) Collaborative Intelligence: Humans and AI Are Joining Forces

[5] September 30) National Day for Truth and Reconciliation (no classes)
[6] October 13) Thanksgiving (no classes)

WEEK 09 MON NOV 03 TUE NOV 04	**Lecture/Tutorial:** Classification (with Python) • DMBA_Chapter 10) Logistic Regression. • MLB_Chapters 04) Supervised Learning: Decision Trees • MLB_Chapters 05) Supervised Learning: SVMs **Quiz and Discussion on Required Reading(s):** • HBRI_07) What Will Happen When Your Company's Algorithms Go Wrong? **Debate:** TBD on A2L by Week 06
WEEK 10 MON NOV 10 TUE NOV 11	**DUE:** Assignment Two (15% of final grade) **Lecture/Tutorial:** Deep Learning • DMBA_Chapter 11) Neural Nets. • MLB_Chapter 06) Supervised Learning: Neural Networks. • MLB_Chapter 10) Model Interpretability. **Quiz and Discussion on Required Reading(s):** • HBRI_10) Three ways AI is getting more emotional • HBRX_03) Algorithms Need Managers, Too. **Debate:** TBD on A2L by Week 07
WEEK 11 MON NOV 17 TUE NOV 18	**Lecture:** LLM and Gen AI • MLB_Chapter 09) Natural Language Processing. **Quiz and Discussion on Required Reading(s):** • Generative AI and the Future of Work. • Turn Generative AI from an Existential Threat into a Competitive Advantage. **Debate:** TBD on A2L by Week 08
WEEK 12 MON NOV 24 TUE NOV 25	**Lecture:** Implementation and Change **Quiz and Discussion on Required Reading(s):** • HBRI_04) Three questions about AI that nontechnical employees should be able to answer. • HBRI_06) How to Choose Your First AI Project. **Debate:** TBD on A2L by Week 09
WEEK 13 MON DEC 01 TUE DEC 02	**DUE:** Final Project Report/Presentation (20% of final grade) **Class Activity:** Final Project Presentations