

**MBA K723E  
Data Mining and Business Intelligence  
Fall 2022 Course Outline**

**Information Systems Area  
DeGroot School of Business  
McMaster University**

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***COURSE OBJECTIVE***

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Business intelligence (BI) is a technology-driven process for analyzing data and presenting actionable information to help corporate executives, business managers and other end users make more informed business decisions. Students will learn the concepts, techniques, and applications of data mining for business intelligence through lectures, class discussions, hands-on assignments, and seminar presentations. Data mining and business intelligence is a very important topic not only in IS area but also in other areas such as finance, marketing, supply chain management, healthcare etc. It will help students to advance in their future career.

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***INSTRUCTOR AND CONTACT INFORMATION***

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**Tuesday 7:00-10:00 PM**  
**RJC Room: TBD**  
**Thomas Francescutti**  
Instructor  
[francest@mcmaster.ca](mailto:francest@mcmaster.ca)  
Office Hours: by appointment  
Class Location: Online

**Graduate Teaching Assistant**  
Fatemeh Navazi  
[navazif@mcmaster.ca](mailto:navazif@mcmaster.ca)

**Course website:** <http://avenue.mcmaster.ca>

***COURSE ELEMENTS***

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

***COURSE DESCRIPTION***

This advanced MBA course introduces basic data mining technologies and their use for business intelligence. Students will learn how to analyze the business needs for knowledge discovery in order to create competitive advantages and how to apply data mining technologies appropriately in order to realize their real business value. Students will gain hands-on experience through assignments and a real-world project or a term paper. The course will cover the following topics:

- The need for business intelligence
- Data mining concepts, methods, and process
- Data mining technologies
- Data mining applications
- Data mining case studies

***LEARNING OUTCOMES***

Upon completion of this course, students will be able to complete the following key tasks:

- Understand the basic concept of business intelligence
- Understand the basic concept and the process of data mining
- Learn basic data mining technologies
- Learn how to use business intelligence to solve business problems
- Use new technologies such as Python, as well as established technologies such as SQL and Microsoft PowerBI to perform data mining tasks

## ***COURSE MATERIALS AND READINGS***

Avenue registration for course content, readings and case materials

➤ <http://avenue.mcmaster.ca>

\$ FREE

**NO Textbook is Needed to be successful!**

**Optional Course Readings:**

Microsoft Business Intelligence (FREE for Student)

<http://www.microsoft.com/bi/>

Reputable data mining books

<https://www.dataminingbook.com/>

## ***EVALUATION***

Learning in this course results primarily from lectures, Avenue to Learn Discussion forum threads, presentations, as well as assignments. The balance of the learning results from the lectures on strategic concepts, from related readings, quizzes, and from researching your presentations and assignments. 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**

Assignment	Weighting	Name
Assignment 1	10%	10% - Databases
Assignment 2	15%	15% - SQL and PowerBI
Assignment 3	15%	15% - Visualizations
Assignment 4	10%	10% - Regression
Memos	10%	10% - 2.5% each (4 Memos)
Capstone Project	40%	40% - Team Project: Business intelligence applications
	100%	

## 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:

LETTER GRADE	PERCENT	POINTS
A+	90-100	12
A	85-89	11
A-	80-84	10
B+	75-79	9
B	70-74	8
B-	60-69	7
F	00-59	0

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## **COMMUNICATION AND FEEDBACK**

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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.degrootemcmaster.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.

**Assignments:** The assignments are designed for students to gain hands-on experience of data mining techniques. They will be completed with each student being part of an assigned group.

**Participation:** No marks are assigned for participation.

**Capstone Project:** Students are required to present a project that investigates an application, a new trend, or an issue(s) associated with data mining and business intelligence. Students are expected to work in a **team with 3-4 members.**

**Midterm and Final Exam(s):** There are no exams for this course.

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## ***CAPSTONE PROJECT GUIDELINES***

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### **Objective:**

To present a research topic that investigate the application of, a new trend in, or the issues associated with data mining and business intelligence.

### **Topic Selection:**

The topic of your capstone project may be on any contemporary issue relating to data mining technology and business applications. Topics include but are not limited to the following examples:

- Issues and challenges of big data and business analytics
- Review business intelligence applications in a special field
- Business intelligence case study
- Advances of data mining technologies
- Security and privacy issues of data mining
- Data mining success factors
- New trends of business intelligence

### **Guidelines:**

1. Student create groups consisting of **3-4** members. Students must develop their own team by week 3. Use discussion forms and direct messages if needed to your peers.
2. Each team should create a 15-minute PowerPoint presentation to accompany the video presentation where each team member must be visually and verbally present in the Zoom presentation.
3. Group marks will be calculated using the Capstone Project Rubric on Avenue to Learn
4. Peer Evaluations **MUST** be completed using the Excel document available on Contents and uploaded to the Capstone Project Peer Evaluations Dropbox by midnight before presentations.

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## ***ACADEMIC DISHONESTY***

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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](http://www.mcmaster.ca/academicintegrity)

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
2. Improper collaboration in group work.
3. Copying or using unauthorized aids in tests and examinations

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### ***AUTHENTICITY/PLAGIARISM DETECTION***

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**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](http://www.mcmaster.ca/academicintegrity).

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### ***COURSES WITH AN ON-LINE ELEMENT***

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**Some courses may** use on-line 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.

The available information is dependent on the technology used. Continuation in a course that uses on-line 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.

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## **CONDUCT EXPECTATIONS**

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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 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.

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## **MISSED AND LATE ACADEMIC WORK**

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### ***Missed Assignments***

Where students miss a regularly scheduled assignment for legitimate reasons as determined by the Student Experience – Academic (MBA) office, the weight for that test/participation will be distributed across other evaluative components of the course at the discretion of the instructor. Documentation explaining such an absence must be provided to the Student Experience – Academic (MBA) office within five (5) working days upon returning to school.

To document absences for health related reasons, please provide to Student Experience – Academic (MBA) office the Petition for Relief for MBA Missed Term Work and the McMaster University Student Health Certificate which can be found on the DeGroot website at <http://mbastudent.degroot.mcmaster.ca/forms-and-applications/>. Please do not use the online McMaster Student Absence Form as this is for Undergraduate students only. University policy states that a student may submit a maximum of three (3) medical certificates per year after which the student must meet with the Director of the program.

To document absences for reasons other than health related, please provide Student Experience – Academic (MBA) office the Petition for Relief for MBA Missed Term Work and documentation supporting the reason for the absence.

## **Late Assignments**

If you do not obtain a Petition for Relief, then a late penalty will be applied using an escalating deduction. Assignments will receive a penalty equal to the sum of each day's penalty. For example, the penalty for being 1 day late = 1 mark; 2 days late = 3 marks (1 mark for one day late + 2 marks for 2 days late), 3 days late = 6 marks, 4 days late = 10 marks (a score of ZERO for the Assignment).

## **Capstone Project**

Groups may "fire" a member by majority vote after three communication attempts, three missed meetings or not completing their prescribed tasks by a deadline agreed to by the group. If a member is "fired" from the group, they will be responsible for completing the Capstone Project requirements individually.

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## **ACADEMIC ACCOMMODATION OF STUDENTS WITH DISABILITIES**

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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>

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## **RELIGIOUS, INDIGENOUS OR SPIRITUAL OBSERVANCES (RISO)**

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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 their Faculty Office **normally within 10 working days** of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

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## **COPYRIGHT AND RECORDING**

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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.

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### ***POTENTIAL MODIFICATION TO THE COURSE***

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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.

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### ***ACKNOWLEDGEMENT OF COURSE POLICIES***

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Your registration and continuous participation (e.g. on A2L, in the classroom, etc.) to the various learning activities of MBA XXXX 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.

**COURSE SCHEDULE & Key Dates**

			Meetings, Q&A, Presentations Etc	Office Hours (Prof & TA)
			Optional/Encouraged	
Week	Week of	Topic	Class	Day/Time
Week 1	Monday, September 12, 2022	Intro, Project Manager Role, Why Data?	In Person (LIVE)	To be Booked via Email
Week 2	Monday, September 19, 2022	Data Mining and BI Introduction	Recording (No Live Connect), but I am around if you need me	To be Booked via Email
Week 3	Monday, September 26, 2022	Databases and Data Warehouses	In Person (LIVE)	To be Booked via Email
Week 4	Monday, October 3, 2022	Data Modelling and SQL	In Person (LIVE)	To be Booked via Email
Week 5	Monday, October 10, 2022	Thanksgiving (no classes) This week	N/A	To be Booked via Email
Week 6	Monday, October 17, 2022	Business Intelligence Tools	In Person (LIVE)	To be Booked via Email
Week 7	Monday, October 24, 2022	Visualizations	In Person (LIVE)	To be Booked via Email
Week 8	Monday, October 31, 2022	Python Introduction	In Person (LIVE)	To be Booked via Email
Week 9	Monday, November 7, 2022	Data Mining and Regression	In Person (LIVE)	To be Booked via Email
Week 10	Monday, November 14, 2022	Catch-up - No Class This Week (Work on Group Capstone Project)	N/A	To be Booked via Email
Week 11	Monday, November 21, 2022	Capstone Project Presentations - Everyone must attend	In Person (Must Attend Live) LIVE	To be Booked via Email
Week 12	Monday, November 28, 2022	Capstone Project Presentations - Everyone must attend	In Person (Must Attend Live) LIVE	To be Booked via Email
Extra Week (if needed)	Monday, December 5, 2022	Extra Week (if needed)	In Person (LIVE)	To be Booked via Email

				Due Date & Upload Approach	
Assignment	Weighting	Name	Week	Due Date	Estimated Time for TA & Profesor Grade Upload to Avenue
Assignment 1	10%	10% - Databases	End of Week 4	Oct 9th	2 Weeks Post Due Date
Assignment 2	15%	15% - SQL and PowerBI	End of Week 6	Oct 23rd	2 Weeks Post Due Date
Assignment 3	15%	15% - Visualizations	End of Week 8	Oct 30th	2 Weeks Post Due Date
Assignment 4	10%	10% - Regression	End of Week 10	Oct 20th	2 Weeks Post Due Date
Memos	10%	10% - 2.5% each (4 Memos)	End of Week 4, 6, 8, 10	Oct 9th, 23rd, 30th, 20th	1-2 Weeks Post Due Date
Capstone Project	40%	40% - Team Project: Business intelligence applications	Week 11	Upload by November 20th - 11:59pm - Group Order TBD	Held Back for Final Grading