Career and Professional Development
Non-Credit Programs

Course Outline

Course Title	**Data Science Capstone Project**
Course Number	YCBS 299
Term	Fall 2019
Continuing Education Units	6 CEUs
Instructor(s)	Nabil Beitinjaneh Alejandro Gutierrez Lopez
Contact Information	nabil.beitinjaneh@mcgill.ca alejandro.gutierrezlopez@mcgill.ca **Office hours:** Upon request
Course Description	This capstone course supported by our industry partners will provide the opportunity to apply all the knowledge gained during the program in order to build a full data science pipeline from preparing and visualizing data, building and testing models, analyzing results and deriving business insights from their analysis. The focus is placed on communicating the insights gleaned from the data analysis through visualizations and on presenting the recommendations reached.
Learning Outcomes	Upon completion of this course, you should be able to:

- Apply essential data analysis tools to ingest, clean, process and analyze various large data sets
- Work through all the phases of complete data problem science pipeline with structured and unstructured data
- Apply different analysis techniques such as descriptive statistics, regression analysis, machine learning, among others, to solve a business problem
- Formulate a business need or problem into a data science project and select the proper tools and algorithms needed
- Interpret and effectively communicate data insights by using data visualization and storytelling techniques and translate them into business-specific knowledge

Course Material   <u>Required:</u>

Reading material and other online resources will be provided through MyCourses.

Instructional Methods Teaching and learning approach is experiential, collaborative and problem-based.

EVALUATION

Item	Format	%	Due date	Explanation
Fundamental modelling and analysis assessment activity	Individually	10 %	Week 2	In class activity to determine the level of understanding of fundamental data analysis and modelling techniques.
Google Cloud Platform and machine learning fundamentals course	Individually	10 %	Week 4	Online course provided by Google on Coursera. This course covers the fundamental elements of storing and analyzing data using the Google Cloud Platform. You need to complete week 1 of the online course before November 23.
Visualization assessment activity	Individually	10 %	Week 6	In class activity to solve a data problem from start to end.
Learning and Project Journal	Individually	10 %	One per class delivered one week after each class	Reflections on the accomplishments, work performed, skills acquired during the week, and work expected to be completed during the following week.
Project 1 - Retail project	Teamwork	25 %	Week 3	Analysis of a retail dataset using the Kaggle platform.
Project 2 - Partner project	Teamwork	35 %	Week 7	Presentation and explanation of the results and recommendations based on the analysis performed. All team members must be present.
Total		100%		

COURSE CONTENT

Class / Day/ Date	Topics / Assignments / Readings
Week 1 Wednesday Nov-6	Course and Kaggle competition overview (Project 1) Introduction to Google Cloud Platform using AutoML
Week 2 Wednesday Nov-13	Fundamental modelling and analysis assessment activity
Week 3 Wednesday Nov-20	Kaggle competition presentations (Project 1) Process from problem to insight
Week 3 - Workshop Saturday Nov-23	Machine Learning modelling using GCP Visualization techniques and Tableau
Week 4 Wednesday Nov-27	Ville de Montreal's journey into data science and analytics Overview of the capstone project datasets (Project 2)
Week 4 - Workshop Saturday Nov-30	Machine Learning modelling using GCP Visualization techniques and Tableau
Week 5 Wednesday Dec-4	Feature Engineering
Week 6 Wednesday Dec-11	Visualization assessment activity
Week 7 Wednesday Dec-18	Project Presentation (Project 2)

GRADING SYSTEM

The following grading scheme applies to the courses forming part of Non-Credit Professional Development Certificate programs.

Numerical Scale		Letter Grade
Pass	85-100%	A
	80-84%	A-
	75-79%	B+
	70-74%	B
	65-69%	B-
Failure	0-64%	F

You must obtain a grade of B- or better to fulfil program requirements. You may not register in a course unless you have passed all the prerequisite courses with a grade of B- or better.

What does a final course grade of "J" mean?

A "J" grade is a failing grade due to either (i) an unexcused absence for an official final exam, or (ii) failure to submit required work worth more than 20% of the final grade for the course as a whole. A "J" grade is calculated as a failure.

FINAL GRADES

The official, final course grade is the one that appears in *Athena* Student Portal on your Record of Study. A final grade appearing in other locations (for example, *myCourses*) is not proofread and subject to change. The School of Continuing Studies reserves the right to make corrections.

To learn more about University letter grades, visit:

https://www.mcgill.ca/study/2018-2019/university_regulations_and_resources/continuing/scs_gi_student_records_grading_grade_point_average.

To learn more about assessment of student work, consult McGill's Student Assessment Policy at: https://mcgill.ca/secretariat/files/secretariat/2016-04_student_assessment_policy.pdf

The official version of this course outline is the version posted on myCourses or the printed version distributed by the instructor at the beginning of the course.

In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.

IMPORTANT INFORMATION

Traditional Territories

McGill University is located on land, which has long served as a site of meeting and exchange amongst Indigenous peoples, including the Haudenosaunee and Anishinabeg nations. McGill honours, recognizes and respects these nations as the traditional stewards of the lands and waters on which we meet today.

Respectful and Professional Communication

This course is designed to help you learn to communicate professionally both during your time at McGill and in your future workplaces. In keeping with McGill's Charter of Student Rights and Responsibilities, it is expected that during class discussions and small group interactions you will communicate constructively and respectfully. Sexist, racist, homophobic, ageist, and ableist expressions will not be tolerated in the classroom or during group meetings held outside of class.

To know more about the Charter of Students Rights and Responsibilities visit the following website at https://www.mcgill.ca/students/srr

UNIVERSITY POLICIES

Email Policy

E-mail is one of the official means of communication between McGill University and its students. As with all official University communications, it is the student's responsibility to ensure that time-critical e-mail is assessed, read, and acted upon in a timely fashion. If a student chooses to forward University e-mail to another e-mail mailbox, it is that student's responsibility to ensure that the alternate account is viable. Please note that to protect the privacy of students, the University will only reply to students on their McGill e-mail account.

Academic Integrity

McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures. To learn more, visit *www.mcgill.ca/integrity*.

Academic Integrity Tutorial (AIT)

Students are responsible for knowing McGill's rules and regulations concerning academic honesty, which can be found on the Student Rights and Responsibilities website. Violations of academic integrity undermine not only the value of honest students' work, but also the academic integrity of the University and the value of a McGill credential. The Student Rights and Responsibilities website provides resources that can help students avoid dishonest work, and an explanation of the disciplinary measures that go with it.

To learn more, visit the following websites:

- https://mcgill.ca/students/srr/publications
- https://mcgill.ca/students/srr/honest/students/test
- https://mcgill.ca/students/srr/honest/students

As of Fall 2019, all newly admitted students must complete the Academic Integrity Tutorial (AIT) in *Minerva* during their first semester at McGill. Failure to complete the tutorial will place a hold in *Athena* and restrict the student from registering for courses in the following semester. The Tutorial can be accessed as follows: Go to Minerva, Student Menu, and then Academic Integrity Tutorial.

Sexual Violence Training: "It Takes All of Us"

In accordance with a new law, Bill 151, Policy to Prevent and Fight Sexual Violence in Higher Education Institutions, McGill will be implementing training measures for all community members. The online training will be mandatory for everyone at McGill – all students, faculty and administrative and support staff. To learn more, visit:

- https://reporter.mcgill.ca/new-education-and-awareness-modules-on-consent-and-sexual-violence-coming-to-mcgill-in-2019
- https://www.mcgill.ca/osvrse

As of Fall 2019, all *newly admitted* student must complete the sexual violence training course, called *It Takes All of Us*. The training will soon be accessible through *myCourses* and will appear as a separate course in your profile.

Right to submit in English or French

In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded. This does not apply to courses in which acquiring proficiency in a language is one of the objectives.

Exam Policy & Regulations

Students should not make other commitments during a scheduled exam, which is indicated on your course outline. Vacation plans do not constitute valid grounds for the deferral or the rescheduling of examinations, tests or assignments. See the School of Continuing Studies Calendar for the regulations governing examinations or go to www.mcgill.ca/continuingstudies/current-students/exams .

Students may request a deferral of final examinations or timed tests and assignments for medical reasons or out-of-town business commitments, which must be justified in writing with a medical certificate or company letter. To learn more, visit:
https://www.mcgill.ca/continuingstudies/exams-conflicts-deferrals-and-rereads

RESOURCES

Athena and Online Resources
Access your student profile and course information including online access to *myCourses* through *Athena* Student Portal*:*
https://continuingstudies.mcgill.ca/portal/logon.do?method=load

Equity, Diversity, and Inclusion

McGill University is committed to promoting an equitable environment where the fundamental dignity of all of its members is respected. The objectives of McGill's Policy on Harassment, Sexual Harassment and Discrimination Prohibited by Law are to promote education and awareness about equity issues and to ensure that procedures are in place to address complaints of harassment, sexual harassment and discrimination prohibited by law.

McGill University is also committed to creating and sustaining a safe environment through proactive, visible, accessible and effective approaches that seek to prevent and respond to sexual violence. McGill's Policy against Sexual Violence underlines this commitment and ensures that procedures are in place to address complaints of sexual violence.

Should you experience discrimination, harassment, bullying, or any other form of victimization, contact the Senior Equity & Inclusion Advisor (SEIA). To learn more, visit:
https://www.mcgill.ca/how-to-report/about-contact/seia
If you are interested in learning more about equity, diversity, and inclusion, visit the Social Equity and Diversity (SEDE) at: https://mcgill.ca/equity_diversity

Health and Wellness

McGill provides a number of resources to support students who find themselves experiencing a mental health issue. It is not uncommon, and you are not alone.
To learn more about these resources, visit: www.mcgill.ca/studentservices/health-wellness
To learn more about Counselling Services, visit: https://www.mcgill.ca/counselling/

Student Services

Various services are available to Continuing Studies students. To learn more, visit:
https://www.mcgill.ca/continuingstudies/getting-started

Students with Disabilities

McGill is committed to providing an inclusive learning environment. If you experience barriers to learning in this course, do not hesitate to discuss them with me. If you have a special learning need or disability, you are encouraged to contact the Office for Students with Disabilities.
To learn more, visit: www.mcgill.ca/osd

Students who have a documented disability and require academic accommodation must contact McGill's Office for Students with Disabilities (OSD).
For information on Exam Accommodation, visit:
- https://www.mcgill.ca/osd/exams
- https://mcgill.ca/osd/student-resources/forms/scs-accommodation-request

McGill Writing Centre (MWC) Tutorial Service

Writing well is key to both academic and professional success! The McGill Writing Centre (MWC) offers credit courses in academic and professional writing, and a tutorial service open to all McGill students. The tutorial service offers one-to-one sessions with seasoned instructors and experienced tutors who will work with you at any stage of the writing process.
To learn more, visit:
- https://www.mcgill.ca/mwc
- https://www.mcgill.ca/mwc/tutorial-service

McGill Library

Watch a short welcome video and learn about the McGill Library in English, French, Arabic, Chinese, Hindi, Persian, Spanish or Urdu at https://www.mcgill.ca/library/orientation.

Computer Labs

Free access to computer labs is available at 688 Sherbrooke (12th floor), MACES, the McLennan Library and other locations on campus.

MACES

The McGill Association of Continuing Education Students, MACES, is located at 3437 Peel, 2nd floor, tel. (514) 398-4974. To learn more, visit: https://maces.ca/

Career Advising and Transition Services (CATS)

Gain the clarity, skills, confidence and connections you need to succeed in your career thanks to the support provided by Career Advising and Transition Services (CATS).To learn more, visit :
https://www.mcgill.ca/continuingstudies/career-advising-and-transition-services