DALHOUSIE UNIVERSITY
FACULTY OF MANAGEMENT
School of Information Management

School of Information Management
INFO/BUSI 6513 Business Analytics and Data Visualization
Fall 2022/2023

Course Type (e.g. F2F, online, blended): Online and/or blended in Halifax[1] (see course description)

Instructor name/title:

Colin Conrad, Ph.D. | Assistant Professor
School of Information Management
Dalhousie University

Website: https://colinconrad.com
Google Scholar: https://scholar.google.com/citations?user=VstyDe8AAAAJ&hl=en

How to contact me: I prefer to communicate by email or Microsoft Teams and check my email and Teams messages very often. If you wish to contact me quickly, I recommend one of these two platforms, and I will almost always respond to you within 48 hours, except on Saturdays. You are welcome to reach out to me about anything related to the course at any time. In the event of a class cancellation or other unforeseen circumstances, I will create an announcement on Brightspace, Teams and class email.

Office hours: By appointment only. You can book an appointment here.

Course website: Brightspace

Tutorials: Wednesdays from 12:35 pm to 2:25 pm, either in-person or online. See Class Format for details.

Teaching Assistant(s) name/contact info: To be announced.

COURSE DESCRIPTION

This course provides an introduction to Business Analytics and Data Visualization. It covers the processes, methodologies and practices used to transform the large amounts of business and public data into useful information to support business decision-making. Students will learn how to extract and manipulate data from these systems. They will also acquire basic knowledge of data mining and statistical analysis, with a focus on data visualization. The students will also learn to build and use management dashboards and balanced

[1] Halifax is sometimes referred to as Kjipuktuk, in the Mi'kmaq language. Mi'kma'ki, the land of the Mi'kmaq, has been my home for most of my life, and I am grateful to live in a land where people can be so welcoming, despite so much historical hardship. If you are interested in learning more about the history of this land and its peoples, I encourage you to reach out to an elder, or to read a book. I learned a lot by reading *Out of the Depths* by Isabelle Knockwood, who shared her experience at the Indian Residential School at Shubenacadie, Nova Scotia. Dalhousie's library system has three copies. Alternatively, you can purchase a copy here.

scorecards using a variety of data design and visualization tools. The course will be made up of a combination of conceptual and applied topics with classes being held in a computer lab. Technologies to be used will be focused on end-user analytics and data visualization and will include state of the art tools for self-serve business analytics.

COURSE PRE-REQUISITES

INFO 5590, BUSI 5512, or permission from the instructor.

LEARNING OUTCOMES

This course will prepare students to conduct business analysis using some of the industry-leading tools. The instruction is designed to be very hands-on and will help students become familiar with best practices and gain hands-on experience to help prepare them for a career that leverages business analytics. Upon completion of the course, students are expected to have gained basic knowledge or proficiency in the following areas:

1. Have an understanding of business analytics tools and how businesses use them;
2. Extract, manipulate and transform data from different sources;
3. Perform some basic data mining and analysis;
4. Generate reports, design dashboards and other visualizations;
5. Apply different concepts and skills in various business contexts using case studies and hands-on exercises with leading software applications.

TECHNOLOGIES USED

We will use a large number of software packages in this course. Some of the software will not be compatible with your computer (especially if you own a Mac). Furthermore, some of the software will not be installed on the lab computers. If you have trouble accessing the software, you can remotely log onto the computers in the Rowe building (rooms 3080 and 4055) using Dalhousie VLab. You can learn more about accessing VLab here. We will also have a video to help you connect to VLab.

- Microsoft Excel (This should be available to you though Dalhousie and VLab)
- SAP Lumira Discovery (Students can install this on Windows or access with VLab)
- SAP Business Objects Analysis (Students can install this on Windows or access with VLab)
- Microsoft Power BI (Students can install this on Windows)
- IBM Cognos Insights (Students can install this on Windows or access with VLab)
- SAP Crystal Reports (Students can install this on Windows or access with VLab)
- Tableau Public (You can install this on Windows or Mac)
- SAP Predictive Analytics (Students can install this on Windows or access with VLab)
- SAP Lumira (Design) Studio Students can install this on Windows or access with VLab)

Other tools such as SAP Analytics Cloud or SAP HANA are on the cloud and do not require installation.

DESCRIPTION OF CLASS FORMAT

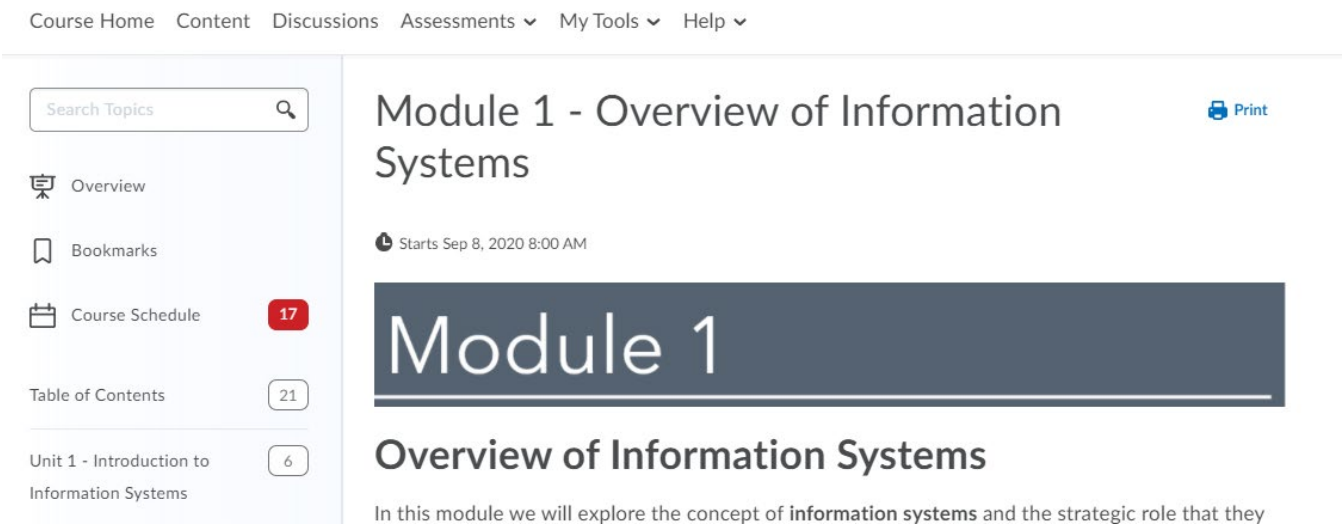
INFO 6513 emphasizes flexibility above all else. The course is offered fully online and is designed to be completed almost entirely asynchronously (as in, at your own pace) if you so choose. All lectures are delivered online and are pre-recorded. All hands-on exercises will have a supporting pre-recorded video designed to help you with the exercise as needed. Your "attendance" will be recorded through the completion of small deliverables related to hands-on exercises, or through assignments that emphasize the lecture content.

In addition to pre-recorded sessions, INFO 6513 will also have a synchronous session on Wednesdays from 12:35 pm until 2:25 pm which is designed to support the hands-on activities. This session will be offered live in Rowe 4055 on Dalhousie's Studly campus, though we will also hold a parallel digital live session at this time. You are **encouraged** to attend the synchronous session either in-person or online, though it is **not required**.

LEARNING MANAGEMENT SYSTEM SITE INFORMATION

The learning management system used by this course is Brightspace, Dalhousie's institutional platform. You can access Brightspace by visiting https://dal.brightspace.com/ and logging in with your Dalhousie Web ID and password. Starting September 7th, you should see the INFO 5590 widget under "My Courses" on your home landing page.

We will use Brightspace to provide all learning materials including course readings, lecture videos, and related course information. You can access the course materials using the Content tab. From there, you can select the weekly contents using the tab to the left of the screen. From there, you can access each course unit and module, which will present the relevant content on the main pain, as per the picture below.



INSTRUCTIONAL METHODS

All class lectures are provided online asynchronously and can be accessed through your Brightspace account and are released at 8:00 am on each Monday at the beginning of the week. During each synchronous session from 12:35 until 1:15 or so, we will rehash some of the lecture content and provide an opportunity to ask questions. The remainder of the synchronous course will be used to complete the lab materials, with the support of the professor and TA. All course deliverables will be due on 11:55 pm on a Friday.

In Dalhousie's MI program, students come from many diverse backgrounds and may not have deep experience with technology. You are not expected to be a technical expert and need not be an expert to perform well in this course. The goal of this course is to introduce students to the skills required to be effectively use and manage information technologies that are used in most organizations (whether they be non-profit, government, or private). Students who do well in this course nonetheless consistently demonstrate an openness to synthesising hands-on experience with managerial considerations that are relevant to their interests or career context.

LEARNING MATERIALS

You must acquire the following textbook, such as through this website:

Kale, N. and Jones, N (2020). *Practical Analytics*. Epistemy Press.

Other course readings will be provided on Brightspace. Occasionally, additional readings will be posted to Brightspace in advance of each week's class. Note that readings will be evaluated through the course quizzes.

METHODS OF EVALUATION

Detailed instructions regarding each assignment will be provided. Assessment of all assignments is directly related to attention to the instructions, clarity of expression and presentation, and evidence of significant analysis and reflection.

See also the SIM Grading Policy.

COMPONENT	DETAILS	DUE DATES	VALUE
BA Toolkit Portfolio	A toolkit featuring your use of the various lab tools and the in-class exercises given. The final portfolio consists of an executive summary and 7 portfolio chapters. Each chapter consists of 4-6 professional looking single-spaced pages with between 4 and 8 annotated screenshots featuring the work that you did. There are three components to this assignment: • Portfolio Chapters 1-2 Draft (10% of final grade) • Portfolio Chapters 3-5 Draft (15% of final grade) • Finished BI Toolkit Portfolio (25% of final grade)	Oct 7th; Nov 4th; Dec 9th	50%
Group Project	The goal of the group project is to seek out and compare different tools with the ones covered in class. This project will consist of an asynchronous recorded group presentation delivered at the end of the semester, as well as a brief 3000-4000 word report which describes the insights from the tools. • Group project proposal (5% of final grade) • Group project brief report (10% of final grade) • Group project presentation (15% of final grade)	Oct 28th; Nov 25th	30%
Online Quizzes	There will be 2 online quizzes covering material from the textbook. Each quiz will be designed to be 20 minutes long and consist of a combination of true/false questions, multiple choice and multi-section questions. You will have a one-week window to complete the quiz.	Oct 14th; Dec 2nd	20%

INTEGRATION OF MI Competencies

PROGRAM COMPETENCY	COURSE LEARNING OUTCOME	COURSE ASSESSMENT
Adaptation	1, 5	Portfolio
Collaboration	4, 5	Group Project
Commitment to equity, diversity, inclusion, accessibility, and decolonization	5	Portfolio, Group Project
Communication	2, 3, 4, 5	Portfolio, Group Project
Digital and technological literacy	1, 2, 3, 4, 5	Portfolio, Group Project, Quizzes
Evidence-based practices	1, 2, 3, 4, 5	Portfolio, Group Project, Quizzes
Leadership	5	Group Project
Learning	1, 4, 5	Portfolio, Quizzes
Management	2, 3, 4, 5	Portfolio, Group Project
User-centred design	1, 4, 5	Portfolio, Group Project

CLASS POLICIES

Attendance
Class attendance is required in all MI courses and is included in the participation mark. Attendance records will be kept by the instructor.

Citation Style
SIM courses use APA as the default standard citation style. Unless the instructor provides alternative written instructions, please use the APA citation style in your assignments to briefly identify (cite) other people's ideas and information and to indicate the sources of these citations in the References list at the end of the assignment. For more information on APA style, consult Dalhousie Library website at https://libraries.dal.ca/help/style-guides.html or the APA's Frequently Asked Questions about APA

Late penalties for assignments
A penalty for late assignments will be assessed, unless prior permission has been given by the instructor to submit an assignment late, which normally will be for extended illness, medical, or family emergencies only (see below). Late submissions will be assessed a penalty of five percent per day, including weekends. Assignments will not normally be accepted seven days or more after the due date; in such cases the student will receive a grade of zero.

Missed or Late Academic Requirements due to Student Absence
Dalhousie University recognizes that students may experience short-term physical or mental health conditions, or other extenuating circumstances that may affect their ability to attend required classes, tests, exams or submit other coursework.

Dalhousie students are asked to take responsibility for their own short-term absences (3 days or less) by contacting their instructor by phone or email prior to the academic requirement deadline or scheduled time **AND** by submitting a completed Student Declaration of Absence form to their instructor in case of missed or late academic requirements. Only 2 separate Student Declaration of Absence forms may be submitted per course during a term.

Classroom recording
While pre-recorded videos are provided to you for the lecture content, you may wish to record a live session. You are welcome to do so if you think it will benefit you.

SIM GRADING POLICY

A+	90-100	Demonstrates original work of distinction.
A	85-89	Demonstrates high-level command of the subject matter and an ability for critical analysis.
A-	80-84	Demonstrates above-average command of the subject matter.
B+	77-79	Demonstrates average command of the subject matter.
B	73-76	Demonstrates acceptable command of the subject matter.
B-	70-72	Demonstrates minimally acceptable command of the subject matter.
F	<70	Unacceptable for credit towards a Master's degree.

ACCOMMODATION POLICY FOR STUDENTS

The Student Accessibility Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students on the Halifax campus who request accommodation as a result of: a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (NS, NB, PEI, NFLD).
If there are aspects of the design, instruction, and/or experiences within this course that result in barriers to your inclusion please contact the Student Accessibility Centre. Please visit www.dal.ca/access for more information and to obtain the Request for Accommodation form.

A note taker may be required as part of a student's accommodation. Visit https://www.dal.ca/campus_life/academic-support/accessibility/accommodations-/classroom-accommodation.html for more details.

Please note that your classroom may contain accessible furniture and equipment. It is important that these items remain in the classroom, undisturbed, so that students who require their use will be able to fully participate.

ACADEMIC INTEGRITY

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect. As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.

The commitment of the Faculty of Management is to graduate future leaders of business, government and civil society who manage with integrity and get things done. This is non-negotiable in our community and it starts with your first class at Dalhousie University. So when you submit any work for evaluation in this course or any

other, please ensure that you are familiar with your obligations under the Faculty of Management's Academic Integrity Policies and that you understand where to go for help and advice in living up to our standards. You should be familiar with the Faculty of Management Professor and Student Contract on Academic Integrity, and it is your responsibility to ask questions if there is anything you do not understand.

Dalhousie offers many ways to learn about academic writing and presentations so that all members of the University community may acknowledge the intellectual property of others. Knowing how to find, evaluate, select, synthesize and cite information for use in assignments is called being "information literate." Information literacy is taught by Dalhousie University Librarians in classes and through Dalhousie Libraries' online Citing & Writing tutorials.

Do not plagiarize any materials for this course. For further guidance on what constitutes plagiarism, how to avoid it, and proper methods for attributing sources, please consult the University Secretariat's Academic Integrity page.

Please note that Dalhousie subscribes to plagiarism detection software that checks for originality in submitted papers. Any paper submitted by a student at Dalhousie University may be checked for originality to confirm that the student has not plagiarized from other sources. Plagiarism is considered a very serious academic offence that may lead to loss of credit, suspension or expulsion from the University, or even the revocation of a degree. It is essential that there be correct attribution of authorities from which facts and opinions have been derived. At Dalhousie, there are University Regulations which deal with plagiarism and, prior to submitting any paper in a course; students should read the Policy on Academic Dishonesty contained in the Calendar.

Furthermore, the University's Senate has affirmed the right of any instructor to require that student assignments be submitted in both written and computer readable format, e.g.: a text file or as an email attachment, and to submit any paper to a check such as that performed by the plagiarism detection software. As a student in this class, you are to keep an electronic copy of any paper you submit, and the course instructor may require you to submit that electronic copy on demand. Use of third-party originality checking software does not preclude instructor use of alternate means to identify lapses in originality and attribution. The result of such assessment may be used as evidence in any disciplinary action taken by the Senate.

Finally:
If you suspect cheating by colleagues or lapses in standards by a professor, you may use the confidential email: ManagementIntegrity@dal.ca which is read only by the Assistant Academic Integrity Officer.

Faculty of Management clarification on plagiarism versus collaboration:

There are many forms of plagiarism, for instance, copying on exams and assignments. There is a clear line between group work on assignments when explicitly authorised by the professor and copying solutions from others. It is permissible to work on assignments with your friends but only when the professor gives you permission in the specific context of the assignment. University rules clearly stipulate that all assignments should be undertaken individually unless specifically authorised.

Specific examples of plagiarism include, but are not limited to, the following:

- Copying a computer file from another student, and using it as a template for your own solution
- Copying text written by another student
- Submitting the work of someone else, including that of a tutor as your own

An example of acceptable collaboration includes the following:

- When authorised by the professor, discussing the issues and underlying factors of a case with fellow students, and then each of the students writing up their submissions individually, from start to finish.

UNIVERSITY STATEMENTS

This course is governed by the academic rules and regulations set forth in the University Calendar and the Senate.

ACCESSIBILITY

The Student Accessibility Centre is Dalhousie's centre of expertise for matters related to student accessibility and accommodation. We work collaboratively with Dalhousie and King's students, faculty, and staff to create an inclusive educational environment for students. The Centre is responsible for administering the university-wide Student Accommodation Policy working across all programs and faculties.

STUDENT CODE OF CONDUCT

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.

DIVERSITY AND INCLUSION

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness (Strategic Priority 5.2).

INTERNATIONALIZATION

At Dalhousie, "thinking and acting globally" enhances the quality and impact of education, supporting learning that is "interdisciplinary, cross-cultural, global in reach, and orientated toward solving problems that extend across national borders."

RECOGNITION OF MI'KMAQ TERRITORY

Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq. We are all Treaty people. For more information about the purpose of territorial acknowledgements, or information about alternative territorial acknowledgements if your class is offered outside of Nova Scotia, please visit https://native-land.ca/.

The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit the office in the McCain Building (room 3037) or contact the programs at elders@dal.ca or 902-494-6803 (leave a message).

FAIR DEALING POLICY

The Dalhousie University Fair Dealing Policy provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at Dalhousie.

COURSE SCHEDULE

Date of Class	Topics	Required Readings and Material
Week of Sep 6th	Course Introduction	Required Readings: None. Weekly Lab Exercises: Excel Pivot Tables.

Week of Sep 12th	Overview of Analytics and Data Wrangling	Required Readings: *Practical Analytics* Chapters 1 and 2. Weekly Lab Exercises: Open Data Wrangling with SAP Lumira Discovery.
Week of Sep 19th	Data Modelling & ETL	Required Readings: *Practical Analytics* Chapters 3 and 4. Weekly Lab Exercises: SAP BusinessObjects Analysis for MS Office.
Week of Sep 26st	Data Cubes, Data Processing (OLAP)	Required Readings: *Practical Analytics* Chapter 5. *IBM Redbook* Chapter 4. Weekly Lab Exercises: SAP Predictive Analytics; IBM Cognos Insight.
Week of Oct 3rd	Business Reporting and Performance Measurement	Required Readings: *Practical Analytics* Chapter 6. Weekly Lab Exercises: SAP Analytics Cloud; SAP Crystal Reports; Microsoft Power BI.
Week of Oct 10th	Dashboards and Visualization Pt. 1	Required Readings: *SAPL Data Visualization Handbook*. Weekly Lab Exercises: Tableau Basics and Dashboard; Data Manipulation for Analysis using Tableau.
Week of Oct 17th	Dashboards and Visualization Pt. 2	Required Readings: *Practical Analytics* Chapter 7. Weekly Lab Exercises: SAP Predictive Analytics for Visualization.
Week of Oct 24th	Text, Web, and Social Analytics	Required Readings: Materials provided on Brightspace. *No More Secrets* Part III: Big Social – Predicting Behaviour with Big Data (pp. 87-127). Weekly Lab Exercises: Facebook Analytics (Demo); Text Mining Analysis with Wine Data
Week of Oct 31st	Data Mining and Big Data Analytics	Required Readings: *Practical Analytics* Chapters 8 and 9. Weekly Lab Exercises: SAP Predictive Analytics with SAP HANA Data; SAP Predictive Analytics for Data Mining.
Week of Nov 7th – FALL STUDY BREAK – NO CLASS		
Week of Nov 14th	Data Mining with In-Memory Technologies	Required Readings: *Practical Analytics* Chapters 10 and 11. Weekly Lab Exercises: SAP HANA In-Memory Exercise; Graph Processing.
Week of Nov 21st	GIS & Emerging Trends in Business Analytics	Required Readings: A Tutorial on Geospatial Information Systems. Weekly Lab Exercises: Geospatial Analytics with SAP Lumira Discovery.

Week of Nov 28th	On Computer Programming & Project Presentations	Required Readings: What is Pandas? Why and how to use Pandas in Python; 10 minutes to Pandas. Weekly Lab Exercises: None.