

# RYERSON UNIVERSITY

**Ted Rogers School of Information Technology Management  
And G. Raymond Chang School of Continuing Education**

## **(C)ITM 618 - Business Intelligence and Analytics**

### **COURSE OUTLINE FOR 2020-2021**

#### **1.0 PREREQUISITE**

The prerequisite for this course is ITM207 and (QMS102 or QMS210) Students who do not have the prerequisite will be dropped from the course.

#### **2.0 INSTRUCTOR INFORMATION**

- Name:
- Office Phone Number:
- E-mail address:
- Faculty/course web site(s): <https://my.ryerson.ca>
- Office Location & Consultation hours:
  - Your instructor is available for personal consultation during scheduled consultation hours which are posted on their office door or on the course shell in D2L Brightspace. However, you are advised to make an appointment by e-mail or by telephone before coming to ensure that the professor is not unavoidably absent.
- E-mail Usage & Limits:

Students are expected to monitor and retrieve messages and information sent through D2L and Ryerson email on a frequent and consistent basis. In accordance with the policy on Ryerson student email accounts ([Policy 157](#)), Ryerson requires that any electronic communication by students to Ryerson faculty or staff be sent from their official Ryerson email account. Messages from other accounts may be disregarded.

#### **3.0 CALENDAR COURSE DESCRIPTION**

This course provides an introduction to business intelligence and analytics, defined as the extensive use of data, statistical and quantitative analysis, exploratory and predictive models, and fact-based management to drive decisions and actions. The development and use of data warehouses and data marts, and the application of selected data (including text and web) mining techniques to business decision making is illustrated. Students actively participate in the delivery of the course through case and project presentations.

#### **4.0 COURSE OBJECTIVES AND LEARNING OUTCOMES**

Learning outcomes describe what students are expected to have learned or achieved; as a result, they usually describe what students will be capable of doing, or what evidence will be provided to substantiate learning.

Fact-based management has always been a critical management practice, only gaining more attention by recent trends such as the overabundance and variety of data available to managers, progress in technologies that can process such data, and the intensity of competition that drives the quest for ever increasing organizational efficiency. The organizations that will sustain their competitive edge in this environment will be those that not only invest in technologies to capture, store, process, and report data, but add human creativity to these processes. Thus this course aims to arm students with major skills required for business analytics as well as an understanding of critical issues and trends in this area.

#### **COURSE OBJECTIVES**

To gain an understanding of how managers to use business analytics to formulate and solve business problems and support decision making

- To become familiar with the processes needed to develop, report, and analyze business data
- To implement analytical models in the software tools, interpret the results of business analytics and their implications to business administrations and make data driven decisions to optimize the business process and address issues in business administrations
- To identify key components of a Business Analytics process, implement analytical models in the software tools, interpret the results of business analytics and their implications to business administrations and make data driven decisions to optimize the business process and address issues in business administrations.

#### **5.0 TEXTS & OTHER READING MATERIALS**

**Title:** Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking

**Author:** Foster Provost, Tom Fawcett

**Publisher:** O'Reilly

**ISBN:** 978-1449361327

**Title:** Business Intelligence, Analytics, and Data Science: A Managerial Perspective, 4th Edition

**Author:** Ramesh Sharda, Dursun Delen, Efraim Turban

**Publisher:** Pearson

**ISBN:** 978-0134633282

#### **Suggested/Recommended Textbook**

**Title:** Modeling Techniques in Predictive Analytics with Python and R.

**Author:** Thomas W. Miller

**Publisher:** Pearson

ISBN-13: 978-0133892062

Other readings/cases will be distributed in class or electronically.

## 6.0 TEACHING METHODS

In Fall 2020 this course will be taught remotely in virtual classrooms. Instruction will take place at scheduled hours, following the approach outlined in D2L Brightspace. You will not be required to attend the Ryerson University campus to complete this course.

The pedagogical approach for this course is based on the principles of experiential learning. The course will incorporate the following teaching/learning methods: Lectures, readings, case study analysis, labs exercises, group project and discussions are the primary teaching methods in this course. Students are expected to have studied the assigned readings and completed any online or written pre-class assignments prior to attending the lectures. The lectures will review and expand the textual material and provide students with the professor's commentary, examples, and illustration. The case studies will be used to link theoretical foundations to practice in a business context. The group project will enable students to develop their "soft skills". Each student is expected to contribute to assigned tasks/assignments and the group project. An additional 9 hours will be required each week for independent reading, research, and practice using the software.

## 7.0 EVALUATION, ASSESSMENT AND FEEDBACK

The grade for this course is composed of the mark received for each of the following components:

Evaluation Component	Percentage of the Final Grade
Assignments	20%
Course Project	25%
Midterm Examination	20%
Final Examination	35%
<b>Total</b>	<b>100%</b>

**NOTE:** Students must achieve a course grade of at least 50% to pass this course.

- ❖ At least **20%** of student's grade based on individual work will be returned to students prior to the last date to drop a course in [good academic standing](#).

### Citation Format for Essays and Term Papers

All essay assignments, term paper and other written works must adhere with APA citation format. Technical errors (spelling, punctuation, proofing, grammar, format, and citations) and/or inappropriate levels of language or composition will result in marks being deducted. You are encouraged to obtain assistance from the Writing Centre ([www.ryerson.ca/writingcentre](http://www.ryerson.ca/writingcentre)) for help with your written communications as needed.

You can find APA guidelines and academic referencing from the following online resources:

[Student Learning Support > Online Resources > Writing Support Resources](#)

- [APA Basic Style Guide](#)

[Ryerson Library Citations and Style Guides](#)

- [APA Style](#)

### 8.0 PLAGIARISM DETECTION

Turnitin.com is a plagiarism prevention and detection service to which Ryerson subscribes. It is a tool to assist instructors in determining the similarity between students' work and the work of other students who have submitted papers to the site (at any university), internet sources, and a wide range of books, journals and other publications. While it does not contain all possible sources, it gives instructors some assurance that students' work is their own. No decisions are made by the service; it generates an "originality report," which instructors must evaluate to judge if something is plagiarized.

Students agree by taking this course that their written work will be subject to submission for textual similarity review to Turnitin.com. Instructors can opt to have student's papers included in the Turnitin.com database or not. Use of the Turnitin.com service is subject to the terms-of-use agreement posted on the Turnitin.com website. Students who do not want their work submitted to this plagiarism detection service must, by the end of the second week of class, consult with their instructor to make alternate arrangements.

Even when an instructor has not indicated that a plagiarism detection service will be used, or when a student has opted out of the plagiarism detection service, if the instructor has reason to suspect that an individual piece of work has been plagiarized, the instructor is permitted to submit that work in a non-identifying way to any plagiarism detection service.

### 9.0 TOPICS – SEQUENCE & SCHEDULE

Session	Topic	Learning Outcomes	Reading(s)	Activities & Due Dates
1	Introduction to Business Intelligence, Analytics and Decision Support	Get familiarized yourself with important BI/BA/DSS terminology, concepts, and issues	B1 – CH01 B2 – CH01	
2	Business Intelligence and Data Warehousing	- Understand the difference between operational databases and data warehouses	B2 – CH03	

		<ul style="list-style-type: none"> <li>- Define the concept of a “data mart” and various data warehouse architectures</li> <li>- Apply OLAP operations</li> </ul> <p>Get familiarized future data warehousing trends</p>		
<b>3</b>	Data Cleaning and Visualization	<ul style="list-style-type: none"> <li>- Describe the nature of data</li> <li>- Explain the methods used to make real-world data analytics ready</li> <li>- Identify different types of visualization techniques</li> </ul> <p>Understand the capabilities and limitations of dashboard</p>	B2 – CH02	
<b>4</b>	Introduction to Data Mining	<ul style="list-style-type: none"> <li>- Get familiarized with the wide range of applications of data mining</li> <li>- Understand the standardized business analytics process</li> </ul> <p>Describe Supervised and unsupervised data mining</p>	B1 – CH02 B2 – CH04	<b>Assignment 1</b>
<b>5</b>	Predictive Analytics	<ul style="list-style-type: none"> <li>- Apply (supervised) classification techniques</li> <li>- Understand with correlation analysis</li> </ul>	B1 – CH03 B2 – CH04	

		<ul style="list-style-type: none"> <li>- Describe attribute/variable selection</li> </ul> <p>Explain parameter estimation</p>		
<b>6</b>	Statistical Modeling: Regression Analysis	<ul style="list-style-type: none"> <li>- Get familiarized with the concept of statistical modeling for business</li> <li>- Demonstrate linear/logistic regression model for business</li> </ul> <p>Identify “optimal” model parameters based on data;</p>	B1 – CH04	<b>Assignment 1 grades</b>
<b>7</b>	<b>Midterm Examination</b>			<b>Intro. Group Project</b>
<b>8</b>	Similarity, Neighbors, and Clusters	<ul style="list-style-type: none"> <li>- Describe (unsupervised) hierarchical clustering techniques</li> <li>- Describe (unsupervised) non-hierarchical clustering techniques</li> <li>- Explain similarity of objects described by data</li> </ul> <p>Apply similarity for prediction</p>	B1 – CH06 B2 – CH04	
<b>9</b>	Model Performance Analytics and Model Visualization	<ul style="list-style-type: none"> <li>- Understand visualization of model performance under various kinds of uncertainty</li> <li>- Explain further consideration of what is desired</li> </ul>	B1 – CH05 B1 – CH08	<b>Assignment 2</b>

		<p>from data analytics results</p> <ul style="list-style-type: none"> <li>- Explain underfitting and overfitting, cross-validation and regularization.</li> </ul> <p>Get familiarized with profit curves; cumulative response curves; lift curves; ROC curves</p>		
<b>10</b>	Representing and Mining Text	<ul style="list-style-type: none"> <li>- Explain representation of text for data analytics</li> <li>- Understand the concept of Natural Language Processing</li> </ul> <p>Apply text mining to a collection of documents</p>	<p>B1 – CH10 B2 – CH05</p>	<b>Midterm grades</b>
<b>11</b>	Introduction to Big Data	<ul style="list-style-type: none"> <li>- Understand the similarities and differences between traditional and “big” data collections</li> </ul> <p>Get familiarized with big data technologies such as Hadoop, Apache Spark and NoSQL</p>	B2 – CH07	<b>Assignment 2 grades</b>
<b>12</b>	Emerging Business Analytics Trends and Future Impacts	<ul style="list-style-type: none"> <li>- Describe the concept of BI/DA in a cloud computing environment</li> <li>- Understand BI/BA impacts on organizations</li> </ul> <p>Explain advanced BA Tasks and Techniques</p>	<p>B1 – CH12 B2 – CH08</p>	<b>Group Project</b>

## 10.0 VARIATIONS WITHIN A COURSE

All sections of a course (Day and CE sections) will follow the same course outline and will use the same course delivery methods, methods of evaluation, and grading schemes. Any deviations will be posted on D2L Brightspace once approved by the course coordinator.

## 11.0 OTHER COURSE, DEPARTMENTAL, AND UNIVERSITY POLICIES

For more information regarding course management and departmental policies, please consult the [Course Outline Appendix](#) which is posted on the [Ted Rogers School of Information Technology Management website](#).

**NOTE:** Students must adhere to all relevant university policies found in their online course shell in D2L and /or on the following URL: [senate-course-outline-policies](#).

The appendix covers the following topics:

- Attendance & Class Participation
- Email Account
- Request for Academic Consideration
- Examinations & Tests
- Late Assignments
- Standard of Written Work
- Academic Grading Policy
- Academic Integrity
- Student Rights

## Important Resources Available at Ryerson

- [Academic Accommodation Support](#): Ryerson University acknowledges that students have diverse learning styles and a variety of academic needs. If you have a diagnosed disability that impacts your academic experience, connect with Academic Accommodation Support (AAS). Visit the [AAS website](#) or contact [aasadmin@ryerson.ca](mailto:aasadmin@ryerson.ca) for more information. Note: All communication with AAS is voluntary and confidential, and will not appear on your transcript.

- [The Library](#) provides research workshops and individual assistance. If the University is open, there is a Research Help desk on the second floor of the library, or go to [Workshops](#).
- [Student Learning Support](#) offers group-based and individual help with writing, math, study skills, and transition support, as well as [resources and checklists to support students as online learners](#).
- You can submit an [Academic Consideration Request](#) when an extenuating circumstance has occurred that has significantly impacted your ability to fulfill an academic requirement.
- [Ryerson COVID-19 Information and Updates for Students](#) summarizes the variety of resources available to students during the pandemic.
- Familiarize yourself with the tools you will need to use for remote learning. The [Continuity of Learning Guide](#) for students includes guides to completing quizzes or exams in D2L or Respondus, using D2L Brightspace, joining online meetings or lectures, and collaborating with the Google Suite.