

# RYERSON UNIVERSITY

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

## (C)ITM 501 – Decision Analysis

### COURSE OUTLINE FOR 2020-2021

#### 1.0 PREREQUISITE(S)

The prerequisite for this course is ITM 107 or QMS 110 or QMS 130. 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 virtual consultation during scheduled consultation hours. Information on the consultation format is provided in the D2L course shell. If you wish to make an appointment, kindly do so via email to ensure the professor is available.
- 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 overview of decision analysis topics important to developing solutions to business problems. This course will take a problem-driven approach to developing students' skills in applying decision trees, expected value analysis, single- and multiple-attribute decisions, sensitivity analysis, and linear programming applied to real-world problems. Students will be required to do problem formulation, develop applications and implement problem solutions using industry-standard software tools.

#### 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.

This course provides an overview of decision analysis topics important to developing solutions to business problems. This course will take a problem-driven approach to developing students' skills in applying decision trees, expected value analysis, single- and multiple-attribute decisions, sensitivity analysis, and linear programming applied to real-world problems. Students will be required to do problem formulation, develop applications and implement problem solutions using industry-standard software tools.

We focus on a number of powerful quantitative methods that support managerial decision-making. Students will learn about decision theory and different decision-making environments, optimization, and business simulation. These concepts will be applied to an extensive set of business problems in an MS-Excel-based analysis environment. As such, the course aims to equip students with analytical skills that are critical for many managerial scenarios. The course applies conceptual and hands-on learning to accomplish its learning objectives.

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

**Title:** Quantitative Analysis for Management, 13th Edition (e-book)

**Author:** B. Render, R. Stair, M. Hanna, T. Hale

**Publisher:** Pearson

**ISBN:** 978-0134543161

### **Suggested/Recommended Textbook**

- [Introduction to Business Analytics Using Simulation](#) (Individual Chapters)
- [Introduction to Business Analytics Using Simulation](#) (Whole Book)

## **6.0 TEACHING METHODS**

In Fall 2020 this course will be taught 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.

You are expected to already know basic statistical concepts from QMS 102 or QMS 204, and the use of MS Excel from ITM100. This course will help you understand how these concepts apply to real managerial decision-making scenarios. The pedagogical approach for this course is Outcomes Based Action Learning. The reason for this is that it is impossible to develop design competence without structured experiential design learning activities. In this regard, you will receive formal lectures on methods and techniques for managerial decision-making, a set of In-Class Design Exercises, a set of 6 homework assignments, and a project. These will give you hands-on experience to complement conceptual understanding of powerful management techniques and tools.

## **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
Midterm Exam 1	35%
Midterm Exam 2	35%
Assignments	15%
Simulation Project	15%
<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

### Virtual Proctoring

Online exam(s) within this course use a virtual proctoring system. Please note that your completion of the exam will be recorded via the virtual platform and subsequently reviewed by your instructor. The virtual proctoring system provides the instructor with a recording that only includes video where possible indications of suspicious behaviour are identified. Recordings will be held for a limited period of time in order to ensure academic integrity is maintained.

Access to a computer that can support remote recording is your responsibility as a student. The computer should have the latest operating system, at a minimum Windows (10, 8, 7) or Mac (OS X 10.10 or higher) and web browser Google Chrome or Mozilla Firefox. You will need to ensure that you can complete the exam using a reliable computer with a webcam and microphone available, as well as a high-speed internet connection. Please note that you will be required to show your Ryerson OneCard prior to beginning to write the exam. In cases where you do not have a Ryerson OneCard, government issued ID is permitted.

Information will be provided prior to the exam date by your instructor who may provide an opportunity to test your set-up or provide additional information about online proctoring. Since videos of you and your environment will be recorded while writing the exam, please consider preparing the background (room / walls) so that personal details are not visible, or move to a room that you are comfortable showing on camera.

### 9.0 TOPICS – SEQUENCE & SCHEDULE

Session	Lecture, Learning Objectives	In-Class Exercise	Readings	Assignments Due
1	<p><b>Lecture:</b> Introduction to Managerial Decision-Making and Quantitative Analysis</p> <p><b>Learning Objective:</b> The student should be able to recognize the variety of managerial decision scenarios</p>	Building spreadsheet models for break-even analyses	Chapter 1	
2	<p><b>Lecture:</b> Decision Analysis – Different Decision-making Environments</p> <p><b>Learning Objective:</b> The student should be able to identify the differences between decision environments and conduct what-if analysis</p>	Creating and analyzing decision-trees	Chapter 3	
3	<p><b>Lecture:</b> Advanced Decision Concepts</p> <p><b>Learning Objective:</b> The student should be able to incorporate interdependence of decisions and individuals' utility models into the analysis of decision scenarios</p>	Analysis of utility functions	Chapter 3	<b>Homework Assignment 1:</b> Decision-Making Under Risk and Value of Perfect Information
4	<p><b>Lecture:</b> More on Decision Theory</p> <p><b>Learning Objective:</b> The student should be able to model and analyze decisions in various risk and pay-off scenarios</p>	Modeling and solving a variety of problems from different domains	Chapter 3	
5	<b>Midterm 1</b>			
6	<p><b>Lecture:</b> Linear Programming Models</p> <p><b>Learning Objective:</b> The student should be able to define decision variables, goal(s), and constraints of an optimization problem</p>	Generating an LP model for a given manufacturing problem	Chapters 7,8	

7	<b>Lecture:</b> Solving LP Models <b>Learning Objective:</b> The student should be able to use MS Excel Solver to solve LP problems	Using Solver for the manufacturing problem	Chapters 7,8	
8	<b>Lecture:</b> LP Sensitivity Analysis <b>Learning Objective:</b> The student should be able to use MS Excel Solver to conduct LP sensitivity analysis	Using Solver to conduct sensitivity analysis for the manufacturing problem	Chapters 7,8	
9	<b>Lecture:</b> Integer and Nonlinear Programming <b>Learning Objectives:</b> The student should be able to model and solve integer programming and nonlinear programming models	Formulating integer programming and nonlinear programming models and solving them using Excel's Solver	Chapter 10	<b>Homework Assignment 2:</b> Generating an LP model, model solution and sensitivity analysis with MS Excel
10	<b>Midterm 2</b>			
11	<b>Lecture:</b> Introduction to Simulation with MS Excel <b>Learning Objectives:</b> The student should understand what business problems call for simulation, the basics of Monte Carlo simulations, and the use of MS Excel for random variable, data table, and scenario generation,	Monte Carlo Simulations of an Inventory Problem with MS Excel	Chapter 13	
12	<b>Lecture:</b> Using MS Excel for Building Simulation Models <b>Learning Objective:</b> The student should understand the use of MS Excel for building simulations	Monte Carlo Simulations of an Inventory Problem with MS Excel  Monte Carlo Simulations of an Queuing Problem with MS Excel	Chapter 10	<b>Project Introduction:</b> Simulation with MS Excel  <b>Homework Assignment 3:</b> Generation of Demand Forecasts

## 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 [asadmin@ryerson.ca](mailto:asadmin@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.