RYERSON UNIVERSITY

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

(C)ITM 703 – <u>Current Issues in Information Systems Management:</u> <u>Artifical Intelligence in Business</u>

COURSE OUTLINE FOR 2020-2021

1.0 PREREQUISITE(S)

The prerequisite for this course is ITM 618 (Bus Intelligence and Analytics). 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

The purpose of this course is to teach students how fundamental Artificial Intelligence (AI) and Machine Learning (ML) techniques are applied to solve real-world business problems. Students will learn how neural networks are designed and implemented. The learning process starts by looking at a neural network with only one node and then it will be extended to multiple nodes and multiple layers, and eventually backpropagation is covered. A deep discussion on the current and future

applications of AI and neural networks on solving real problems in Finance, Healthcare, Media, Security, Education, and Energy is presented.

4.0 COURSE OBJECTIVES AND LEARNING OUTCOMES

- To gain understanding of how Artificial Intelligence (AI) and Machine Learning (ML) are used to solve challenging business problems and make businesses run more efficiently.
- To become familiar with the concept of neural networks and how neural networks are designed.
- To implement simple to advanced neural networks and use them to solve real problems.
- To understand the process of backpropagation in neural networks.
- To understand and be able to discuss how AI and ML are able to address a variety of problems in Finance, Healthcare, Media, Security, Education, and Energy.

5.0 TEXTS & OTHER READING MATERIALS

Required textbook:
Book 1
Title: Make your own Neural Network
Author: Tariq Rashid
Publisher: CreateSpace Independent Publishing Platform; 1 edition, 2016
ISBN: 1530826608

Suggested Textbooks:
Book 2
Title: The Sentient Machine: The Coming Age of Artificial Intelligence
Author: Amir Husain
Publisher: Scribner, 2016
ISBN: 1501144685

6.0 TEACHING METHODS

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 instructor'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
Assignment	20%
Course Project	25%
Midterm	20%
Final	35%
Total	**100%**

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) 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
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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	Readings	Activities & Due Dates
1	Overview of Artificial Intelligence and Machine Learning, and their applications in Business	Get familiarized yourself with important AI and Machine learning terminology, concepts, and issues	B1-Part 01 B2-Part 01 B3-CH 01 B3-CH 04	
2	Introduction to Neural Networks	Understand the concept of neural networks Identify the applications of neural networks	B1- Part 01	
3	Training a Simple Classifier using Neural Networks	Understand how to train a classifier Describe the training process of neural networks	B1- Part 01	
4	Learning from Multiple Nodes, Multi-layer Neural Networks	Define layers in a neural network Explain the learning process of nodes in a neural networks	B1- Part 01	
5	Backpropagation and Updating Weights	Understand the backpropagation process in neural network	B1- Part 01	**Assignment 1**

		Learn how a neural network updates weights of neurons		
6	Inside the Mind of a Neural Network	Identify the challenges of working with a neural network Describe potential applications of neural networks	B1- Part 03	
7	**Midterm Examination**			**Intro. Group Project**
8	Applications of AI in Finance	Get familiarized with the applications of AI and neural network in finance domain Identify the problem in finance domain and design the solution using AI enablers	Lecture Notes	**Assignment 1 grades**
9	Applications of AI in Healthcare	Get familiarized with the applications of AI and neural networks in Healthcare Identify the problem in Healthcare and design the solution using AI enablers	Lecture Notes	**Assignment 2**
10	Applications of AI in Education and Media	Get familiarized with the applications of AI and neural networks in education and media	Lecture Notes	**Midterm grades**

		Identify the problem in education and media and design the solution using AI enablers		
11	Applications of AI in cyberSecurity and Energy	Get familiarized with the applications of AI and neural networks in cyberSecurity Identify the problem in cyberSecurity and design the solution using AI enablers	Lecture Notes	**Assignment 2 grades**
12	Project Presentation			

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 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.