Deep Learning COMP 433

Fall 2023

Instructor:	Geraldin Nanfack	**Time:**	Thursday: 18:45 – 21:15
Email:	geraldin.nanfack@concordia.ca	**Place:**	TBD

Note: This syllabus is subject to change and any changes will be posted in the Announcements section of your Moodle portal.
Teaching Assistants (TA):
COMP 433 Section J Lab - Ghelmani Rashid Abad, Ali
COMP 433 Section I Lab - Nada Abdelkhalek

MS Teams We will use MS Teams in addition to Moodle for announcements and to facilitate project group discussions. Follow instructions on Moodle to join the MS Teams group for the course.

Text Book: The course textbooks will be:

1. **Deep Learning** by Goodfellow et al. freely available at www.deeplearningbook.org;
2. **Dive into Deep Learning** freely available online at http://preview.d2l.ai/d2l-en/master/.

However, some material not in the textbook will be covered with appropriate references.

Objectives: This course is designed for undergraduate students. By the end of the course, students will have an in-depth knowledge on currently popular Deep Learning methods and paradigms, practical experience in applying them, and familiarity with some of the research frontiers.

Prerequisites: An undergraduate-level understanding of linear algebra, multivariate calculus, and probability, algorithms, is assumed.

Course Content:

Lec 1- Machine Learning Foundations for Deep Learning
Lec 2 - Introduction to Neural Networks
Lec 3 - Backpropagation
Lec 4 - Automatic Differentiation Software
Lec 5 - Optimization for Deep Learning
Lec 6 - Training Deep Neural Networks in Practice
Lec 7 - Convolutional Neural Networks
Lec 8 - RNNs, Sequence models, Seq2Seq
Lec 9 - Attention and Self-Attention
Lec 10 - Multi-task and Transfer Learning
Lec 11 - Introduction to Deep Generative Models
Lec 12 - Self-Supervised Learning

Evaluation Policy:

Assignments (30%)

- 2 Problem sets distributed throughout the semester
- The assignments will be programming projects and as some paper and pencil problems (20% of the assignment).
- Assignments are to be done strictly individually

Project: (30%)

- Teams of 2-3 students will work on a project. Students will select from a predefined project or give their own proposal.

Quizzes: (30%)

- 3 Quizzes will be given throughout the semester in class (announced well in advance).
- The quizzes will be 30-45min long with multiple choice and long answers.

Labs: (10%)

- Throughout the semester weekly labs will be given and TAs will assist students in doing the lab
- There will be two phases of labs (graded and ungraded): the first 4 labs will be due (all together) after the first month and comprise the lab grade.
- Subsequently labs 5 through 10 will be given weekly but will not require a submission.

Key Dates and Scheduling (Subject to Change):

- The first 4 labs will be due approximately 4 weeks into the course.
- Quizzes - To be Announced
- Assignments - Assignment 1 will be given in week 4 and due in week 8, similarly Assignment 2 will be given week 8.
- Project will be assigned by the end of September and due shortly after the last day of class

Academic Honesty: Maximum possible penalties for violations of the academic honesty policy will be applied. In your assignments and final project report do not copy, paraphrase, or translate anything from anywhere without saying where you obtained it. For assignments, you will be allowed to discuss with other students but may not directly share work. Specifically, submissions that are identified to have the

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