Faculty of Arts and Sciences - Computer Science

CSC413H1 S
Neural Networks and Deep Learning
Winter 2024 Syllabus

Course Meetings

CSC413H1 S

Section	Day & Time	Delivery Mode & Location
LEC0101	Tuesday, 1:00 PM - 4:00 PM	In Person: MC 254
LEC0201	Thursday, 1:00 PM - 4:00 PM	In Person: SF 1105
LEC2001	Tuesday, 1:00 PM - 4:00 PM	In Person: MC 254
LEC2101	Thursday, 1:00 PM - 4:00 PM	In Person: SF 1105
LEC2501	Tuesday, 6:00 PM - 9:00 PM	In Person: BA 1170
LEC5101	Tuesday, 6:00 PM - 9:00 PM	In Person: BA 1170

Refer to ACORN for the most up-to-date information about the location of the course meetings.

Course Contacts

Course Website: https://amfarahmand.github.io/NN-Winter2024/

Instructor & Coordinator: Dr. Amir-massoud Farahmand
Email: csc413-2024-01@cs.toronto.edu

Instructor: Amanjit Kainth
Email: csc413-2024-01@cs.toronto.edu

Instructor: Robert Wu
Email: csc413-2024-01@cs.toronto.edu
Office Hours and Location: Tuesday 4-5PM @ BA 2272

Course Overview

An introduction to neural networks and deep learning. Backpropagation and automatic differentiation. Architectures: convolutional networks and recurrent neural networks. Methods for improving optimization and generalization. Neural networks for unsupervised and reinforcement learning.

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Course Learning Outcomes

Prerequisites: CSC311H1/ CSC311H5/ CSCC11H3/ CSC411H1/ STA314H1/ ECE421H1/ ROB313H1/; MAT235Y1/ MAT237Y1/ MAT257Y1/ MAT257Y5/ MAT291H1/ MAT294H1/ AER210H1/ (MAT232H5, MAT236H5)/ (MAT233H5, MAT236H5)/ (MATB41H3, MATB42H3); MAT223H1/ MAT240H1/ MAT185H1/ MAT188H1/ MAT223H5/ MATA23H3
Corequisites: None
Exclusions: CSC321H1/CSC421H1, CSC321H5, CSC413H5. NOTE: Students not enrolled in the Computer Science Major or Specialist program at A&S, UTM, or UTSC, or the Data Science Specialist at A&S, are limited to a maximum of 1.5 credits in 300-/400-level CSC/ECE courses.
Recommended Preparation: None
Credit Value: 0.5

Course Materials

No required course materials. Lecture slides and optional readings listed on course website.

Marking Scheme

Assessment	Percent	Details	Due Date
Term Test	20%	Take-home test for 48 hours.	2024-04-02,2024-04-03,2024-04-04
Project Proposal	10%	Proposal for the research project. The standard is a research paper with some intellectual value that could reasonably be submitted to a conference or workshop. Negative results are acceptable as long as methodology is well-documented and comprehensive analysis included. Students work in groups of three to four.	2024-02-16

Assessment	Percent	Details	Due Date
Project Report+Code	20%	Final submission (report and code) for the research project. The standard is a research paper with some intellectual value that could reasonably be submitted to a conference or workshop. Negative results are acceptable as long as methodology is well-documented and comprehensive analysis included. Students work in groups of three to four.	2024-04-19
Mathematical Homeworks	8%	Two mathematical problem sets to be completed individually or in pairs.	2024-01-19,2024-03-01
Programming Assignments	32%	Eight programming assignments to be completed individually or in pairs.	2024-01-19,2024-01-26,2024-02-02,2024-02-09,2024-03-01,2024-03-08,2024-03-15,2024-03-22
Paper Readings	10%	Paper summaries and reflections of five research papers selected from a bank of at least fifteen papers.	2024-03-29

Late Assessment Submissions Policy

In general, each deliverable has a late policy of up to 72 hours after the due time. A 10% penalty is applied to each 24 hour window for up to a 30% deduction.

Policies & Statements

Late/Missed Assignments

This item is listed here to remind you to include your late/missed assignment policy; if you have late penalties, you are required to publish them in your syllabus. Please see the A&S Academic Handbook (https://www.artsci.utoronto.ca/faculty-staff/teaching/academic-handbook) sections on missed term work (Section 4.7), late term work and extensions (section 4.8), and missed term tests (Section 5.3) for more information.

Late/Missed Assignments

Deliverables can be submitted up to 72 hours late with a 10% penalty applied per 24 hour window. Any deliverable not submitted past this window will receive a grade of 0. Extensions and penalty waivers can be requested for valid reasons by reaching out to the teaching team.