

COMP 4741/6741- 001 Intro to Neural Networks Fall Term 2023

Instructor: Salim Sazzed

Time and Location: TR 02:40 pm-04:05 pm, Dunn Hall 225

Email: ssazzed@memphis.edu

Phone: 757-275-5573

Office Hours: By appointment (Dunn Hall, Room 131)

TA: Mahmudul Islam Sajib (msajib@memphis.edu)

TA Office Hours: please email TA (CC me) to schedule a meeting.

If you have any questions, please send an email to the TAs and copy me. Whenever you deem it necessary to get answers from me, you may communicate with me directly via email or phone.

Learning Objectives

The aim of this course is to develop a comprehensive understanding of the principles, techniques, and applications of neural networks. Both theoretical and empirical aspects of neural network will be covered.

Learning materials: Class Lectures, Online Videos, Interactive Discussions, Textbooks, Online resources, etc.

Topics (subject to change)

- Neural Network (NN)
- Fundamentals of Neural Networks
- Neurons and Activation Functions
- Feedforward Neural Networks
- Backpropagation and Training
- Loss Functions and Optimization
- Regularization and Overfitting
- Architectures and Variants: Convolutional Neural Networks (CNNs) for image processing, Recurrent Neural Networks (RNNs) for sequence data, Introduction to Long Short-Term Memory (LSTM) and Gated Recurrent Units (GRUs), GAN, Encoder/Decoder.
- Ethical and Future Considerations Ethical implications of neural networks, Bias and fairness in machine learning
- Applications in real-world problems (Image recognition and classification, Natural language processing and sentiment analysis)

Course Textbook

You are not required to use any specific books; feel free to utilize any textbooks of your choice. I encourage you to explore online resources like tutorials and YouTube videos to enhance your understanding.

Laptop:

Feel free to bring your laptop to class, as we will be utilizing online resources during the lectures.

Pre-Requisites

Linear Algebra, Probability Theory, Algorithm Analysis, Python.

Evaluation

Your final grade for this course will be determined by the following averaging procedure ([subject to change](#)):

Assignments (2-3)	≈ 10 %
Monthly Exams (2-3)	≈ 40 %
Final Exams (1)	≈ 20 %
Project (1)	≈ 30 %

Grading

Grading: A+ ≥ 95%, A ≥ 92%, A- ≥ 87%, B+ ≥ 82%, B ≥ 77%, B- ≥ 72%, C ≥ 65%

Note: A modified curve may be used for determining the grades at the discretion of the instructor.

Policies (modified from the COMP/EECE 7745 Machine Learning (Summer 2023) offered by Md Zahangir Alom)

1. Exams are closed book and closed notes.
2. No late homework will be accepted unless well-documented reasons are presented.
3. All homeworks must be individual work. Plagiarizing assignments or code sharing is not permitted.
4. Although class attendance does not contribute to your marks, it's important to make an effort to attend all the classes. There is a strong correlation between regular attendance and obtaining a good grade. Students are responsible for any material and content covered in missed lectures.
5. No early or late exams will be given unless under extreme situations.
6. Any grading errors in assignments should be notified within a week to the TA.
7. By taking this course, you agree that any assignment turned in may undergo a review process and that the assignment may be included as a source document in Turnitin.com's restricted access database solely for the purpose of detecting plagiarism in such documents. Any assignment not submitted according to the procedures given by the instructor may be penalized or may not be accepted at all.
8. If plagiarism or cheating occurs, the student will receive a failing grade on the assignment and (at the instructor's discretion) a failing grade in the course. The course instructor may also decide to forward the incident to the University Judicial Affairs Office for further disciplinary action. For further information on U of M code of student conduct and academic discipline procedures, please refer to <https://www.memphis.edu/osa/students/academic-misconduct.php>