

# DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

কম্পিউটার সায়েন্স এন্ড ইঞ্জিনিয়ারিং বিভাগ

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Nov 18, 2023

To

Head

Department of Nanomaterials and Ceramic Engineering

BUET, Dhaka-1000, Bangladesh

**Subject: Regarding the "Deep Learning" (post-graduate) course**

Dear Colleague

Assalamu Alaikum


I am pleased to inform you that our department will be offering the course titled "Deep Learning" (Course No.: CSE 6709) in the upcoming October 2023 semester. Under the current circumstances, there is a huge scope of interdisciplinary research works virtually in every domain involving topics in computing particularly machine learning and deep learning. Acknowledging this, our BPGS has taken the decision to invite interested and talented students from your department to enroll in the above-mentioned course. This enrollment will be by invitation only and we can only allow a total of 10 students in the upcoming semester across all departments of BUET.

Under the circumstances, we request you to provide a couple of nominations (in order of priority) in this regard by 25/11/2023. This will be a two-step process where upon receiving nominations from you (and other departments), we plan to finalize the nominations and accordingly notify you by 27/11/2023 to forward the registration through BIIS. As per the academic calendar and course schedule the first class of the course will happen on 29/11/2023.

The syllabus and schedule of the course as well as an expected competency level of the student is attached in Enclosure A. We note that the department has a plan to offer a more general machine learning course for engineers which will be more conducive for students having no computing background.

We seek your kind cooperation in this regard.

Yours Truly,

  
Dr. Mahmuda Naznin  
Professor and Head  
18/11/2023

D. Saiful

> Please nominate a few students.

> We will send the list before the deadline.

Thanks

  
18/11/2023

## **Enclosure A**

### **Schedule:**

Wednesday 17:00 - 20:00

ECE 504

### **Syllabus:**

CSE 6709

Deep Learning

3 Credit Hour Course

Foundations of Neural Networks and Deep Learning: components of a learning algorithm, activation functions, loss functions, back propagation, multi-layer perceptron, regularization, dropouts, weight decay, batch normalization, optimization algorithms; Convolutional Neural Networks (CNN): convolution and pooling, variants of convolutional layers, dilated convolution, transfer learning; Recurrent Neural Networks (RNN): computing gradients in RNN, deep RNN; sequence-to-sequence architectures, word embedding, recursive networks, backpropagation through time, vanishing and exploding gradients, long short term memory (LSTM), self attention, transformer; Deep Unsupervised Learning: autoencoders, variational autoencoders, generative adversarial networks; Advance topics: graph neural networks, deep reinforcement learning, attention and memory models.

### **Expected Competency of the students as prerequisite:**

- Probability and linear algebra basics
- Machine learning fundamentals
- Basic programming skills