



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

High-Performance Deep/Machine Learning

CSE 5442

Credit Hours:

3.00

Course Levels:

Undergraduate (1000-5000 level)

Graduate

Course Components:

Lecture

Course Description:

This course combines high performance computing (HPC) and artificial intelligence (AI). This emerging trend combines the principles and practices of distributed training, which is critical for the success of both deep learning and machine learning disciplines.

Prerequisites and Co-requisites:

Pre-req: 2431 or 3430; and 3521 or 5521; or Grad standing.

Course Goals / Objectives:

- Master the principles of deep/machine learning
 - Master the implications of different ways of using high-performance computing (HPC) systems for scale-up and scale-out of deep/machine learning algorithms
 - Master the different methods of performing distributed deep/machine learning parallelism techniques (data, model, spatial, layer, hybrid etc)
 - Be familiar with the architectural designs of past and present (state-of-the-art) high-performance computer systems
 - Be familiar with analyzing and solving AI problems using deep/machine learning algorithms
 - Be exposed to emerging trends in high-performance computing architectures for deep/machine learning
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Course Topics:

- Overview
 - Deep Learning Frameworks
 - Introduction to HPC Technologies
 - Overview of the state-of-the-art DL Models
 - Data Parallel DNN Training using HPC Environment
 - Model Parallel DNN Training using HPC Environments
 - Advanced Parallelization Strategies
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Designation:

Elective