

THE UNIVERSITY OF KENTUCKY
Department of Mathematics

MA 721 Topics in Numerical Analysis: Deep Learning.
Spring 2019
MWF 1:00-1:50 - CB 343

Instructor: Dr. Qiang Ye
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Office Hours: MWF 2:00-3:00 pm

Class Home Page: <http://www.ms.uky.edu/~qye/MA721/ma721.html>

Text: There will be no required text, but the following books will be good references:

- Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning, MIT Press, 2016.
- Charu C. Aggarwal, Neural Networks and Deep Learning, Springer, 2018.

Prerequisites: Familiarity with multivariate calculus, linear algebra and numerical methods will be assumed. Programming in Python will be required.

Grading: Homeworks: 60%,
Presentation: 40%.

All students are required to give an in-class presentation on a research paper to be assigned. The presentation need to be given in slides and a draft should be submitted a week in advance for grading and feedback.

The following is a tentative scale for grading, subject to adjustment.

Grade	Minimum %
A	90
B	75
C	60

Syllabus: In this course, we study a widely applicable class of machine learning methods called deep learning. We will cover the following topics:

- Deep Feedforward Networks.
- Convolutional Networks

- Recurrent Networks
- Generative Models for Unsupervised Learning

Selected materials from optimization, linear algebra, and probability theory/information theory will be covered.