



SYLLABUS

COLLEGE OF COMPUTING AND SOFTWARE ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE

CS 7357 – NEURAL NETWORKS AND DEEP LEARNING

ACADEMIC TERM: SPRING 2021

Course Information

Class meeting time: M/W 8:00PM-9:15PM

Modality and Location: Traditional On Campus / Fully Online.

Location: D2L

Course Website: <https://kevinsuo.github.io/teaching.html>

Instructor Information

Name: Kun Suo

Email: ksuo@kennesaw.edu

Office Location: J-318

Office phone: 470-578-2524

Office Hours: T, Th 2:00 p.m. – 3:00 p.m. and by appointment

Preferred method of communication: email

Course Description

The course is an introduction to deep learning and the methodologies for applying artificial neural networks. It covers the fundamentals of deep learning and the theoretical principles of neural networks, including deep learning models such as convolutional architectures, recurrent architectures, and other types of neural networks.

Prerequisites: CS 6045

Credit Hours: 3-0-3

Course Materials

Required Texts:

Deep Learning (Adaptive Computation and Machine Learning series), Ian Goodfellow, The MIT Press, 2016, ISBN-13: 978-0262035613.

Recommended Texts:

Hands-On Neural Networks with TensorFlow 2.0: Understand TensorFlow, from static graph to eager execution, and design neural networks, Paolo Galeone, Packt, 2019, ISBN-13: 978-1789615555.

Technology requirements: TBD

Learning Outcomes

Upon the completion of the course, students should be able to:

1. Explain the major technology trends driving Deep learning
2. Build, train and apply fully connected deep neural networks
3. Implement efficient (vectorized) neural networks
4. Explain the key parameters in a neural network's architecture
5. Develop a research project and paper

Course Requirements and Assignments

Summary of Assignments:

1. Programming Assignment – KNN
2. Programming Assignment – Linear & Logistic regression
3. Programming Assignment – MNIST classification using CNN

Evaluation and Grading Policies

The final grade will be assessed based on students' progress and findings as follows:

Assessment Criteria:	
Attendances+Presentation	10%
Homework assignments	30%
Test I	20%
Test II	20%
Final exam	20%

Grading Scale:	
A	90% - 100%
B	89% - 80%
C	79% - 70%
D	69% - 60%
F	59% or below

Students will receive feedback on each assignment/presentation within one to two week of the assignment/presentation due date.

Course Policies

Attendance: Class attendance is required and very important for successful completion of the course. Students are expected to attend every class and participate in the discussion of research ideas developed by others in the class. Peer feedback is essential and is part of the grade assigned to each of the course assignments stated above. Excused absences must be planned for, when possible, and justified with documentation. The student is responsible for making up missed class sessions. Late arrival that causes disruption, early departure that causes disruption, excessive conversation among students (a disruption in its own right), inappropriate use of electronic devices that cause disruptions and other actions that disrupt the classroom are unacceptable.

Class Participation: Thoughtful, prepared class participation is essential. This research seminar is designed to give students opportunities to engage classmates and professors in conversations about the research process related to computer science. Some conversations started in this seminar will eventually carry over to their graduate work. Students should take advantage of this opportunity to build their research community by engaging fully in class discussions with fellow students and faculty.

Faculty Conversations: In preparation for the conversations with CS faculty about the research process/method, students must complete assigned background reading. There will be articles or book chapters assigned per class. In addition to the assigned articles or chapters, students should review the background information on the professor.

Email Policy: Students are encouraged to use only their official KSU email account since emails from other accounts may not successfully reach the instructor. Piazza will be used to facilitate interaction between class members.

Classroom Behavior: All students are reminded to conduct themselves in accordance with the Student Code of Conduct, as published in the University Catalog. Every KSU student is responsible for upholding the provision. Students who are in violation of KSU policy will be asked to leave the classroom and may be subject to disciplinary action by the University.

Department or College Policies

Students are expected to be aware that the Computer Science department has certain policies in place that govern practices within the department including:

1. "B" or better grade is required for CS 1321/L and CSE 1322/L and their equivalent transfers. All courses used toward any undergraduate degree in the computer science must be completed with an assessed performance grade of "C" or better. This means that all prerequisite courses from the CS Department must have been completed with a "C" or better in order for a student to enter the next course in a sequence.
2. All requests for course overloads must be made through the College advising office and with the approval of the Program coordinator and department chair. The instructor of any course is not permitted to authorize course overloads.
3. All requests for prerequisite bypasses must be made through the College advising office and with the approval of the Program coordinator and department chair. The instructor of any course is not permitted to authorize course overwrites.
4. All students are encouraged to register their current choice of major using the department major change process. Students who are not recorded under their intended major may find that they may be limited from registering for courses they require to complete their intended program of study.

Institutional Policies

Please visit each of the following links for Institutional policies.

Federal, BOR, & KSU Course Syllabus Policies:

https://curriculum.kennesaw.edu/resources/federal_bor_ksu_student_policies.php

Student Resources:

https://curriculum.kennesaw.edu/resources/ksu_student_resources_for_course_syllabus.php

Academic Integrity Statement:

<https://scai.kennesaw.edu/codes.php>

KSU Student Resources

This link contains information on help and resources available to students:

https://curriculum.kennesaw.edu/resources/ksu_student_resources_for_course_syllabus.php

Additional Resources

For CCSE Student resources: <http://ccse.kennesaw.edu/student-resources.php>

KSU Service Desk: The KSU Service Desk is your portal to getting assistance or access to University IT Services.

Students call: 470-578-3555 or email studenthelpdesk@kennesaw.edu

Information and links to Resources for Graduate Students: <http://graduate.kennesaw.edu/students/>

Links to frequently used and helpful services: <http://www.kennesaw.edu/myksu/>

Course Schedule

Course Topics and Outline: Subject to change and more details.

Week	Topic	Assignments
1	Overview	
2	Machine learning	
3	KNN	Assignment #1
4	Linear regression	
5	Test I	
6	Logistic regression	Assignment #2
7	Feedforward neural network	
8	Convolutional neural network	
9	Spring break	
10	Test II	
11	Recurrent neural network	Assignment #3
12	Unsupervised learning	
13	Generative adversarial network	
14	Research paper presentation	
15	Research paper presentation	
16	Research paper presentation	
17	Final Exam	As scheduled