



THE UNIVERSITY of
NEW ORLEANS

DEPARTMENT OF COMPUTER SCIENCE

Syllabus, Fall 2021

CSCI 6522: Advanced Machine Learning II

Lecture: Monday, Wednesday, Friday: 11:00 AM to 11:50 AM.

Zoom Link and Passcode to attend the class –

Zoom ID: 87319004543

Passcode: 732208

Instructor: Md Tamjidul Hoque

Email: thoque@uno.edu

Phone: 504-280-2406

Office Hours: **Monday** 12 NOON to 1 PM and 6:15 PM to 7:15 PM.

Wednesday 12 NOON to 1 PM and 6:15 PM to 7:15 PM.

Friday 12 NOON to 2 PM.

Online Office Hours: <https://uno.zoom.us/join/87319004543>

Prerequisites: CSCI 4588/5588 or consent of the department.

Textbooks:

Required

[1] Géron, A., 2019. Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow, 2nd ed. O'Reilly.

[2] Deep Learning, by Ian Goodfellow, Yoshua Bengio and Aaron Courville, MIT Press, ISBN 9780262035613, 2016.

Optional:

[3] Practical Deep Learning for Cloud, Mobile, and Edge: Real-World AI & Computer-Vision Projects Using Python, Keras & TensorFlow, by Anirudh Koul, Meher Kasam, and Siddha Ganju.

[4] The Elements of Statistical Learning, 2nd edn, by Trevor Hastie, Robert Tibshirani, and Jerome Friedman. Springer, 2009, ISBN: 978-0387848570. The book is available online, <https://web.stanford.edu/~hastie/ElemStatLearn/>

Course Content: The course is about programming deep/machine learning techniques on given data to build a good predictor using Keras and TensorFlow. Topics covered will include:

- Fundamentals of Neural networks,
- Overview of Deep Neural Network,
- Multi-Layer Perceptron with Keras,
- Training Deep Neural Networks,
- Custom Models and Training with Tensorflow,
- Loading and Preprocessing Data with TensorFlow,
- Deep Vision Using Convolutional Neural Networks,
- Developing Android Apps with TensorFlow Lite and ML Kit,
- Recommender Systems,

- Reinforcement learning,
- Symmetric weights and deep belief networks.

Learning Outcomes: We are in the era of big data, and this data flood requires automated methods to be applied to uncover the patterns to predict future data. This course is about studying and programming the deep/machine learning techniques to address critical pattern recognition and classification problems in various applications from the given dataset. Our objective will be to learn those techniques and to apply them properly. The target techniques are particularly useful in higher dimensional and complex data space, where the deterministic approaches are infeasible or hard to implement. Deep/Machine learning has a broad spectrum of applications such as search engines, stock-market analysis, game playing, medical diagnosis, and bioinformatics.

Online Materials: Essential course material, assignments, announcements, etc. will be posted to this course page on Moodle, <http://www.uno.edu/moodle>. Make sure to check your @uno.edu email frequently.

Attendance: Your attendance in class is needed and essential for you to meet course requirements. A 5% mark is allocated for your attendance.

Grading:

Programming Assignments (3):	marks 39% [In Python / MATLAB / Octave]
[Tentative] Homework Assignments (1):	marks 11%
Class Tests (3):	marks 20% [best 2 counts]
Attendance:	marks 5% { %5: [90-100%], 4%: [85-90], 3%: [80-85], 2%: [75-80], 1%: [70-75], 0%: <70. }
Final Examination:	marks 25% (Must attend final exam to pass)
<i>Grading scale:</i> A: 90+%, B: 80-89%, C: 70-79%, D: 60-69%, F: < 60%.	

Bonus: A student who will be able to produce any publishable work (approved based on superior results, recognized by the instructor during the course period) related to any given assignment(s) or the topics covered in the class will be given 10% bonus marks.

Exams: Tests 1, 2, and 3 are scheduled tentatively on Sep 15th, Oct 15th, and Nov 22nd, respectively.

Last Class: Dec/0103/2021 (Wednesday Friday).

Final Exam: Dec 8th, 10 AM - 12 NOON (Wednesday).

Due Dates: You are responsible for handing in your assignment on time. Late submissions will be assessed at the following rates: 85% for 1-48 hours late, 65% for 49-96 hours late, 45% for 97-144 hours late, 25% for 145-168 hours late. Assignments that are over a week late will receive no credit. For online submission, use Moodle. However, if Moodle is not working for some technical reason, email me (thoque@uno.edu) the assignment. If you cannot act according to the deadlines due to exceptional circumstances, you must inform long before the deadline or provide evidence.

Conducts:

- (1) **All submitted works must be your own.** Any academic dishonesty, including cheating, plagiarism, and conspiracy, will result in zero marks and will be reported to the appropriate authority in the university (<http://www.studentaffairs.uno.edu/pdfs/StudentCodeofConduct.pdf>).
- (2) Please be on time for the class. Late coming into the class is heavily discouraged.
- (3) Please avoid disruptive and noisy activities in the class and be respectful to others.
- (4) **Masks are required in the physical classroom.**