Fall 2015

CSCI 6635

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University of New Orleans

THE UNIVERSITY *of*
NEW ORLEANS

DEPARTMENT OF COMPUTER SCIENCE

Syllabus, *Fall 2015*

CSCI 6635: *Theory & Computer Applications for Pattern Recognition*

Lecture: TuTh, 12:30pm to 1:45pm. **Location**: Math-219.

Instructor: Md Tamjidul Hoque

Office: Math #333
Email: thoque@uno.edu
Phone: 504-280-2406

Office Hours: Mon: 7:15pm-8:15pm, in Math 333.
Tu., Th: 1:45pm-2:45pm, in Math 333.
Wed: 10am-12noon, 7:15pm-8:15pm, in Math 333.

Prerequisites: CSCI 4525 and MATH 2511 or consent of the instructor.

Textbook:

1. ***Required***: 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**, http://www-stat.stanford.edu/~tibs/ElemStatLearn/

2. Pattern Recognition and Machine Learning, by Christopher M Bishop, Springer, 2006, ISBN: 978-0387-31073-2.

3. Pattern Classification, 2nd edn, by Richard O Duda, Peter E Hart and David G Stork. Wiley, 2000, ISBN: 978-0471056690.

4. Machine Learning, An Algorithmic Perspective, 2nd Edition, by Stephen Marsland, ISBN: 978-1-4665-8328-3.

* In most of the cases, study material will be provided by the instructions, which will explain the topic thoroughly and will make the topic easy to grasp.

Learning Outcomes: The course is about applying suitable and effective techniques on given data to build a good predictor. We apply the techniques to help the predictor learn. Our objective will be to learn those techniques as well as to be able to apply those techniques properly. The target techniques are particular useful in higher dimensional and complex dataspace, where the deterministic approaches are infeasible or are very hard to apply.

Course Content: Supervised learning, Probability distributions, Linear methods of regression, Linear methods of classification, Generative model: Bayesian Decision Theory and related, Basis expansions and regularization, Model assessment and selection, Model inference and averaging, Additive models and trees, Boosting and adaptive trees, Sampling and stochastic methods, Neural Networks, Support vector machine, Prototype methods and nearest-neighbors, Unsupervised learning, Random forest, Ensemble learning and Undirected graphical models.

Online Materials: Essential course material, assignments, announcement etc. will be posted to the CSCI 6635 course page on Moodle, http://www.uno.edu/moodle. Make sure to check your @uno.edu email frequently.

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

Grading: [Tentative]

Programming Assignments (**4**):	marks 40% [Some knowledge of MATLAB/Octave is recommended]
Homework Assignments (**1**):	marks 10%
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 to pass**)

Grading scale: 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. The bonus will be added to the total marks, but the overall upper limit will remain 100%. For example, 82% obtained overall marks with bonus marks will be 92% or, 90% marks will be 100%, but 95% will be 100% (not 105%) and so on.

Exams: Test 1, 2 and 3: tentatively on Sep 22th, Oct 22th and Nov 24th respectively.
Last Class: 3rd Dec Thursday (4th Dec Friday).
Final Exam: **Thursday, Dec 10th from 12:30pm to 2:30pm, Location: 219.**

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 are unable to act according to the deadlines due to special circumstances, you must inform long before the deadline or, you must provide evidence.

Conducts:
(1) **All submitted works must be your own**. Any academic dishonesty including cheating, plagiarism and conspiracy will results in 0 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 in the class. Late coming in the class is seriously discouraged.**
(3) **Please avoid disruptive and noisy activities in the class and be respectful to others.**
However, I wish we will never have to see any misconduct. Rather, as you are attending my class paying your time and efforts, I believe you must have good intention to learn. **Both the instructor and the students have to be very serious in the class to make this particular course successful**. Therefore, we should all cooperate to maintain a stimulating environment.

(4) **Special Needs**: Students who seek accommodations for disabilities must contact the Office of Disability Services prior to discussing their individual needs for accommodation with their instructors.
