Department of Computer Science

Fall 2019 Course Syllabus

***CS 584 MACHINE LEARNING***

Wednesday, 6:25 pm to 9:05 pm

August 21, 2019 to November 27, 2019

Room 131, Perlstein Hall

Mr. Ming-Long Lam, Ph.D.

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# PREREQUISITES

A minimum grade of C in the CS 430 Introduction to Algorithms.

# COURSE DESCRIPTION

* Introduce the fundamental problems in machine learning.
* Describe techniques, mathematical concepts, and algorithms used in machine learning.
* Raise awareness of the limitations of various machine learning algorithms
* Formulate the ways to evaluate the performance of learning algorithms.
* Topics may include non-parametric methods, Bayesian decision theory, clustering, decision trees, logistic regression, dimension reduction, naïve Bayes, neural networks, support vector machines, bagging and boosting, and other emerging topics.

# LEARNING OBJECTIVES

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

* Translate a business problem into a closely related set of machine learning tasks
* Select the appropriate algorithms for the machine learning tasks
* Execute the machine learning tasks using the Python language
* Retrieve, interpret, validate, and assess the algorithm outcomes
* Recognize strengths and mitigate disadvantages of the machine learning algorithms
* Aware of common mistakes in machine learning practice and how to avoid them
* Design, plan, execute and critique machine learning projects
* Present analytical solutions that add business values for decision making

# TEXTBOOK

Ethem Alpaydin (2014). *Introduction to Machine Learning*, *Third Edition*, MIT Press. The textbook website is <https://www.cmpe.boun.edu.tr/~ethem/i2ml3e/>.

# SOFTWARE

Python 3.x (Windows, macOS, or Linux), available from the Anaconda distribution. The Spyder development environment is preferred, but not required.

# EVALUATION

Your course grade will be calculated as follows:

* 50% Assignments
* 25% Mid-Term Test
* 25% Final Exam

# GRADING SCALE

|  |  |  |
| --- | --- | --- |
| A | Excellent | 93% and above |
| B | Average | 75% and less than 93% |
| C | Passed | 60% and less than 75% |
| E | Failed | Less than 60% |

# ATTENDANCE

This class will meet once a week on Wednesday evening from 6:25 PM until 9:05 PM. All course goals, session learning objectives, and assessments are supported through lecture, activities, and discussions. Your attendance is thus required and paramount to your success in this class. You are allowed to miss no more than two (2) sessions, provided that you make arrangements with the instructor in advance.

# LATE WORK

All assignments must be submitted to the Blackboard site <https://blackboard.iit.edu> for the course on or before the due date. If you turn in an assignment late, 5% of your earned score may be deducted for every 24 hours after the deadline. Assignments turned in more than seven days late will not receive any credit. In the case of unexpected events, you must contact the instructor before the assignment due date to receive a grace period. Students can only receive up to two (2) grace periods in the course.

# CODE OF ACADEMIC HONESTY

It is contrary to justice, academic integrity, and to the spirit of intellectual inquiry to submit another’s statements or ideas of work as one's own. To do so is plagiarism or cheating, offenses punishable under the Illinois Tech's disciplinary system. Because these offenses undercut the distinctive moral and intellectual character of the Illinois Tech, we take them very seriously.

Proper acknowledgment of another's ideas, whether by direct quotation or paraphrase, is expected. In particular, if any written or electronic source is consulted and the material is used from that source, directly or indirectly, the source should be identified by author, title, and page number, or by website and date accessed. Any doubts about what constitutes "use" should be addressed to the instructor. Please review the information in <https://web.iit.edu/student-affairs/handbook/fine-print/code-academic-honesty>.

# REQUESTING REASONABLE ACCOMMODATIONS

Reasonable accommodations will be made for students with documented disabilities. To receive accommodations, students must obtain a letter of accommodation from the Center for Disability Resources which is located in Room 1C3-2 on the first floor at 3424 S. State Street. The Center for Disability Resources can also be reached at 312.567.5744 or [disabilities@iit.edu](mailto:disabilities@iit.edu). Please visit the center’s site <https://web.iit.edu/cdr> for more information.