



CSCI, 574, 01E, Machine Learning

COURSE SYLLABUS: Fall 2019

INSTRUCTOR INFORMATION

Instructor: Derek Harter, Ph.D., Professor
Office Location: Science 355
Office Hours: T, Th 1 – 3:30 pm
University Email Address: Derek.Harter@tamuc.edu
Preferred Form of Communication: e-mail

COURSE INFORMATION

Materials – Textbooks, Readings, Supplementary Readings

Recommended:

- [CI] Programming Collective Intelligence by Toby Segaran, O'Reilly Media, 2007, ISBN: 0596529325
- [ML] Marsland. (2009). Machine Learning: An Algorithmic Perspective. By Marsland, CRC Press, 2009.
- [PY] How to Think Like a Computer Scientist: Learning with Python 2ed by Jeffrey Elkner, Allen B. Downey and Chris Meyers (Open Book Project)
<http://www.greenteapress.com/thinkpython/>

Course Description

This semester's AI course will focus on the sub field of machine learning with some work in the analysis of big data. We will look at classic unsupervised and supervised learning methods, used in the field to classify data, cluster it and find optimizations. This will include looking at k-means and hierarchical clustering, self-organizing maps, linear regression, decision trees, optimization techniques such as genetic algorithms, etc. We will cover ways of getting hold of interesting datasets, ideas on how to collect data from users, and many different ways to analyze and understand the data once you've found it. Prerequisites: CSCI 515. (3 credit hours)

The syllabus/schedule are subject to change.

Student Learning Outcomes

1. (SLO574.1) Develop familiarity with high-level Python scripting language.
2. (SLO574.2) Learn basics of fundamental machine learning techniques, such as regression, clustering, k-nearest neighbor, kernel methods, etc.
3. (SLO574.3) Learn basic distinction between supervised and unsupervised machine learning methods.
4. (SLO574.4) Learn basic machine learning training and testing techniques, including cross validation and data optimization.

COURSE REQUIREMENTS

Minimal Technical Skills Needed

Students should be proficient in a high level programming language, like C/C++ and have knowledge of undergraduate level statistics and linear algebra mathematics.

Instructional Methods

All materials, assignments and tests will be conducted through the D2L MyLeo Online learning system.

Student Responsibilities or Tips for Success in the Course

To plan a minimum of three hours of outside preparation for each hour of class is a safe time allocation for successfully completing the course.

GRADING

Final grades in this course will be based on the following scale:

A = 90%-100%

B = 80%-89%

C = 70%-79%

D = 60%-69%

F = 59% or Below

Assessments

Exams (2 midterm and final): 50% (25% each)

Labs / Programming Assignments (appx. 4-5): 50% (10% each)

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TECHNOLOGY REQUIREMENTS

LMS

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements

LMS Requirements:

<https://community.brightspace.com/s/article/Brightspace-Platform-Requirements>

LMS Browser Support:

https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

YouSeeU Virtual Classroom Requirements:

<https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-System-Requirements>

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu.

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

COMMUNICATION AND SUPPORT

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

<https://community.brightspace.com/support/s/contactsupport>

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Interaction with Instructor Statement

Please use e-mail and through the MyLeoOnline course to ask questions and for help, and to set up additional appointments if needed. We may use some of the MyLeoOnline virtual classroom tools this semester for online class feedback sessions.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

There will be no make up or extra credit for late assignments. You must turn in all assignments by the required due date, or notify the instructor with a valid reason for missing an assignment.

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

University Specific Procedures

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the [Student Guidebook](http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx).
<http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx>

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum:
<https://www.britannica.com/topic/netiquette>

TAMUC Attendance

For more information about the attendance policy please visit the [Attendance](http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx) webpage and [Procedure 13.99.99.R0.01](http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx).
<http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx>
<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf>

Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

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Undergraduate Academic Dishonesty 13.99.99.R0.03

[http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/
rulesProcedures/13students/undergraduates/
13.99.99.R0.03UndergraduateAcademicDishonesty.pdf](http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf)

Graduate Student Academic Dishonesty 13.99.99.R0.10

[http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/
rulesProcedures/13students/graduate/
13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf](http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf)

Students with Disabilities-- ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services

Texas A&M University-Commerce

Gee Library- Room 162

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: studentdisabilityservices@tamuc.edu

Website: [Office of Student Disability Resources and Services](http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/)

[http://www.tamuc.edu/campusLife/campusServices/
studentDisabilityResourcesAndServices/](http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/)

Nondiscrimination Notice

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal

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Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the [Carrying Concealed Handguns On Campus](#) document and/or consult your event organizer.

Web url: <http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf>

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

COURSE OUTLINE / CALENDAR

Week	Topic / Activity	Notebook	Test
1	Course Introduction, set up python	1a & 1 b	
2	Introduction to Python Scientific Libraries	2a, 2b, 2c, 2d	
3	Linear Regression with One Variable	3a, 3b	
4	Linear Regression with Multiple Variables	4	
5	Logistic Regression and Regularization	5	
6	K Nearest neighbor		
7	Decision Trees and Ensembles	8	
8	Midterm Exam		1
9	Support Vector Machines (SVM) and Kernel Methods	7	
10	Unsupervised Learning and Dimensionality Reduction		
11	Principle Component Analysis (PCA)	12	
12	K-means and Hierarchical Clustering		
13	Anomaly Detection and Recommender Systems	13	
14	Large Scale Machine Learning	14	
15	Advice for Applying Machine Learning	10a, 10b	
16	Final Exam		2

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