



CSCI 556 Data Analysis & Visualization

COURSE SYLLABUS: Spring 2024

INSTRUCTOR INFORMATION

Instructor: Mutlu Mete, PhD, Professor of Computer Science
Office Location: Jour 218
Office Hours: Will be announced in the first week of Semester on D2L portal
Office Phone: 903-886-5497
Office Fax: 903-886-5165
University Email Address: Mutlu.Mete@tamuc.edu
Preferred Form of Communication: Email
Communication Response Time: One business day

COURSE INFORMATION

Textbook(s): Practical Statistics for Data Scientists (50 Essential Concepts), 1st Edition,
ISBN 10: 1491952962 / ISBN 13: 9781491952962

Software Required: Weka (<http://old-www.cms.waikato.ac.nz/~ml/weka/>) Optional Texts
and/or Materials:

Data Mining: Practical Machine Learning Tools and Techniques, 4th Edition. ISBN-13:
978-0128042915, ISBN-10: 0128042915

Course Description

Big scientific data sets are growing exponentially both in size and complexity. Extracting meaningful information from these data requires not only programming skills, but also understanding the analysis work-flows, mathematical models and visualization tools that help to condense large amounts of information into a comprehensible story. We will introduce standard statistical data analysis and modeling methods such as correlation functions, linear regression, clustering, pattern extraction, classification, data mining, as well as Monte Carlo methods which are commonly used in creating simulations in the computational sciences. Different analysis and visualization packages popular in scientific modeling, analysis, and visualization will be introduced.

The syllabus/schedule are subject to change.

Student Learning Outcomes (Should be measurable; observable; use action verbs)

1. The student will gain detailed knowledge about the goal and techniques of the data analysis and visualization process.
2. The student will understand the steps in characterizing and understanding data.
3. The student will be able to build effective predictive models.
4. The student will be able to build models that rely on memorizing training data.
5. The student will be able to build models that have an explicit additive structure.
6. The student will be able to build models for data that has no labeled training data available: Unsupervised learning
7. The student will be able to use software applications for data analysis.

COURSE REQUIREMENTS

Minimal Technical Skills Needed

- Basic knowledge of computer and operating systems
- Basic knowledge of data structure, algorithms, and statistics/probability

Instructional Methods

Online

Student Responsibilities or Tips for Success in the Course

“All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment.” (See Student’s Guide Handbook, Policies and Procedures, Conduct). Talking and other activities that distract/disturb others in the class would not be tolerated. Instructor holds the right to ask you leave the classroom anytime based on any of disturbing attitude. Each student should sign the sign-sheet if asked by instructor. Late student may not be allowed to participate the lecture.

- Participation: Class attendance (mandatory) with active participation of class activities.
- Assignments: Following the given instruction is important. On-time submission of assignments encouraged.
- Exams: Well prepared for exams (with an ability to answer questions within the given exam time); The exams will be paper-based, closed-book/note tests.

GRADING

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

GRADING POLICY:

- A:** 100%- 90%
- B:** 89% - 80%
- C:** 79% - 70%
- D:** 69% - 60%

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F: 59 % - 0%

Assessments

Attendance	10%
Exams	60%, Three exams. One least score will be dropped
Assignments / Quizzes	30%, Three assignments. One least score will be dropped

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.

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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>

Interaction with Instructor Statement

You can come to my office (JOUR218) at any time during office hours regarding any question about any topic, including the questions about this course. I can share my industry and research experiences with you. Other than face-to-face and classroom communications, the primary mode of asynchronous communication is email. My email address is mutlu.mete@tamuc.edu. Usually I email you using a tool in myLeoOnline, where I cannot see/edit your email address. The emails I send through the myLeoOnline go the email address you associated with myLeo system. It could be your @leo.tamuc.edu or other email address from other domains you selected (gmail, yahoo, outlook, etc.). In the first week of semester, I will email you and ensure that you receive this email to establish an electronic communication between you and me. I usually response students' emails in 24 hours. Please wait 24 hours to remind the issue again in the emails. My office number is 903 886 5497; however, the least preferred way of communication is phone calls because of untraceable nature of the actions. If need be, I can give you a phone call appointment to discuss a course issue.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

Credit will be given for ONLY those exams, programs, and/or projects turned in no later than the deadline as announced by the instructor of this class, unless prior arrangement has been made with the instructor. Late programs / projects / assignments can or cannot gain partial credit. Credit for late programs / projects / assignments will be announced with the description of it. Assignments and projects will be posted in university's myLeoOnline communication system. Detailed information will be provided by the instructor. Students also should turn in their assignments through myLeoOnline portal. Each student is responsible for the content/instructions of email communications.

During the online tests, you will not be able to move backwards through pages. It means once you answer a question, you will not able to see it again. Instructor can use plagiarism software during the tests.

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.

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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>

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](#) webpage and [Procedure 13.99.99.R0.01](#).

<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:

Academic Misconduct:

The violation of academic integrity (including cheating and plagiarism) may cause a zero point on that work. Subsequent misconducts may result in a failing grade with the official filing of the case.

[Undergraduate Academic Dishonesty 13.99.99.R0.03](#)

<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>

AI USE POLICY

Texas A&M University-Commerce acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text,

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or suggest replacements for text beyond individual words, as determined by the instructor of the course.

Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).

Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors' guidelines. If no instructions are provided the student should assume that the use of such software is disallowed.

In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

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/>

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

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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 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.

A&M-Commerce Supports Students' Mental Health

The Counseling Center at A&M-Commerce, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit www.tamuc.edu/counsel

COURSE OUTLINE / CALENDAR

Tentative Topics by Week

Week of	TOPIC
1/8/24	Introduction and Weka
1/15/24	Exploratory data analysis
1/22/24	Data and sampling distributions
1/29/24	Input: concepts, instances, attributes
2/5/24	Output: knowledge representation
2/12/24	Regression and prediction
2/19/24	Exam 1
2/26/24	Classification (Part 1)
3/4/24	Classification (Part 2)
3/11/24	SPRING BREAK
3/18/24	Statistical machine learning (Part 1)
3/25/24	Statistical machine learning (Part 2)
4/1/24	Unsupervised learning
4/8/24	Feature selection and data projection
4/15/24	Exam 2
4/22/24	Advanced topics and course review
4/29/24	Exam 3

~~HAVE A VERY SUCCESSFUL SEMESTER~~

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