

BUAN 6341 – Applied Machine Learning
Course Syllabus

Course Information

Course Number BUAN 6341
Course Title Applied Machine Learning

Term Spring 2023
Meeting Time Tuesday 7:00 - 9:45

Professor Contact Information

Professor Rajin Koonjbeary
Office Phone 504-944-9927
Email Address RKK220002@utdallas.edu
Office Location JSOM 3.604
Office Hours Wednesday 7:00p to 8:00p
Other Information Please use your UTD email address to contact the professor.

TA Information

TA Will be announced on week 1
Address Will be announced on week 1
Office Location JSOM 3.604
Office Hours TBD
Other Information Please use your UTD email address to contact the TA.

Course Modality and Expectations

Instructional Mode	This course will be taught in an <i>in-person mode</i>
Course Location	MS Teams for Remote/Virtual mode (eLearning Blackboard as a backup) and JSOM 12.218 for in-person mode
Asynchronous Learning Guidelines	Asynchronous learning option is available for every student who cannot attend live classes during the Remote/Virtual mode. Lectures will be recorded and uploaded into the course group in MS Stream. However, the due dates for homeworks are the same. Asynchronous learning option is NOT available during the in-person mode.
Expectations	The very basic expectations for students are three-fold regardless of the learning mode: (1) watch/attend lectures and play with in-class exercises; (2) contribute to class discussions in realtime and/or teaching materials asynchronously; (3) complete homeworks, exams, projects on time.

COVID-19 Guidelines and Resources

The information contained in the following link lists the University's COVID-19 resources for students and instructors of record.

Please see <http://go.utdallas.edu/syllabus-policies>.

Class Participation

Regular class participation is expected and required regardless of course modality. Students who fail to participate in class regularly are inviting scholastic difficulty. A portion of the grade for this course is directly tied to your participation in this class. It includes engaging in in-class programming activities or after-class discussions that solicit your feedback on homework assignments, readings, or materials covered in the lectures. Evidence on class participation should be provided by the students and verified by the professor (more details below). Successful participation is defined as consistently adhering to University requirements, as presented in this syllabus. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

Class Recordings

The instructor will record meetings of this course only in the Remote/Virtual mode. Any recordings will be available to all students registered for this class as they are intended to supplement the classroom experience. Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the Office of Student Access Ability has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student Access Ability accommodation. If the instructor or a UTD school/department/office plans any other uses for the recordings, consent of the students identifiable in the recordings is required prior to such use unless an exception is allowed by law. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

Class Materials

The Instructor may provide class materials that will be made available to all students registered for this class as they are intended to supplement the classroom experience. These materials may be downloaded during the course. However, these materials are for registered students' use only. Classroom materials may not be reproduced or shared with those not in class, or uploaded to other online environments except to implement an approved Office of Student Access Ability accommodation. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

Course Description

This course covers machine learning models for business data including supervised and unsupervised modeling, non-linear regression models, resampling methods and advanced neural networks and artificial intelligence-based models for data-driven analytics. The course will be taught using Python language. It is expected that students are comfortable enough with Python programming language. There will be very limited emphasize on reviewing Python concepts. The course will cover ML interpretability concepts such as: global and local explain ability, model debugging and model trust.

Student Learning Objectives/Outcomes

By the end of this course, students will be able to

1. Identify the difference between a supervised (classification) and unsupervised (Clustering) technique.
2. Identify which technique they need to apply for a particular dataset and write python code to carry out an analysis.
3. Being able to construct ML experiments to reduce model overfitting and achieve optimal results based on available data and given business problem.
4. Understand and apply ML interpretability concepts.

Course Pre-requisites, Co-requisites, and/or Other Restrictions

This course assume you are familiar with python using Anaconda. Other IDE platform is allowed but will not be used in lectures.

Technical Requirements

- A laptop or desk computer with reasonable processing power. You need to work on your laptop or desk computer in each synchronous meeting.
- Install Python via Anaconda (<https://www.anaconda.com/distribution/>). Be sure to select Python version 3.7 (or higher)
- Homework Zero (worth 0% of the grade) is just to test the software installation and to ensure that you are able to correctly execute code. You must complete and submit this assignment by the due date.

What to Expect during Meeting Time?

Typical class meeting might look like the following, although it will have a certain amount of variation:

(Subject to change)

- 5 minutes for administrative items and answering questions
- 15 minutes of code debugging exercise
- 30 minutes of lecture covering basic concepts
- 70 minutes of programming demo
- 30 minutes of in-class activity
- 15 minutes of a half-time break

Course Access and Navigation

This course can be accessed using your UT Dallas NetID account on the [eLearning](#) website. Please see the course access and navigation section of the [Getting Started with eLearning](#) webpage for more information.

To become familiar with the eLearning tool, please see the [Student eLearning Tutorials](#) webpage. UT Dallas provides eLearning technical support 24 hours a day, 7 days a week. The [eLearning Support Center](#) includes a toll-free telephone number for immediate assistance (1-866-588-3192), email request service, and an online chat service.

Communication

This course utilizes online tools for interaction and communication. Some external communication tools such as regular email and a web conferencing tool may also be used during the semester. For more details, please visit the [Student eLearning Tutorials](#) webpage for video demonstrations on eLearning tools.

Student emails will be answered within 48 hours under normal circumstances.

Distance Learning Student Resources (Does not apply)

Online students have access to resources including the McDermott Library, Academic Advising, The Office of Student Access Ability, and many others. Please see the [eLearning Current Students](#) webpage for more information.

Server Unavailability or Other Technical Difficulties

The University is committed to providing a reliable learning management system to all users. However, in the event of any unexpected server outage or any unusual technical difficulty which prevents students from completing a time sensitive assessment activity, the instructor will provide an appropriate accommodation based on the situation. Students should immediately report any

problems to the instructor and also contact the online [eLearning Help Desk](#). The instructor and the eLearning Help Desk will work with the student to resolve any issues at the earliest possible time.

Academic Calendar (tentative)

Date	Topic	Assignment	Due Date
1/17/2023	Introduction to AI and Machine Learning and an Introduction to Pandas		
1/24/2023	Scikit-learn: Machine Learning in Python		
1/31/2023	Supervised and Unsupervised Learning	Homework 1 using Iris data	2/7/2023 before midnight
2/7/2023	Introduction to WEKA A Few Useful Things to Know about Machine Learning <ul style="list-style-type: none"> • Genetic test for Autism refuted • Support-Vector Networks • Introduction of decision trees 		
2/14/2023	Classification		
2/21/2023	Regression	Homework 2	3/1/2023
3/1/2023	Clustering		
3/7/2023	Exam 1		
3/14/2023	Dimensionality Reduction		
3/14/2023	Distribution Learning	Homework 3	3/21/2023
3/21/2023	Data Preprocessing		
3/28/2023	Classic Supervised Learning Method	Homework 4	4/4/2023
4/4/2023	Deep Learning Methods		
4/11/2023	Bayesian Inference		
4/18/2023	Topics in Machine Learning	Homework 5	4/25/2023
4/25/2023	Review		

Notes: All home works are due by 11:55PM central time (CT).

Grading Policy

Homework 1	100 marks	5%
Homework 2	100 marks	5%
Homework 3	100 marks	5%

Homework 4	100 marks	5%
Homework 5	100 marks	5%
Class participation/Attendance	100 marks	15%
Exam 1	100 marks	30%
Exam 2	100 marks	30%
Total		100%

Grade Scale

Scaled Score	Letter Equivalent
97 – 100	A+
94 – 97	A
90 – 94	A-
87 – 90	B+
84 – 87	B
80 – 84	B-
77 – 80	C+
74 – 77	C
70 – 74	C-
67 – 70	D+
64 – 67	D
60 – 64	D-
< 60	F

Assessing Grades

Students can check their grades by clicking “My Grades” on the course menu after the grade for each assessment task is released.

Course Evaluation and Policies

Class Assignments

There will be five homework assignments and collectively they will count towards 25% of the final grade. Each assignment will be worth 5%. For each assignment you will submit one file containing the responses to all homework questions. All five assignments are individual assignments.

Late Work

Late work might be accepted in this class. However, it must be late for reasons beyond the student’s control such as death in the immediate family or an emergency medical procedure. Late work, if accepted, will be assessed a penalty—10 points for work that is up to 24 hours late and 20 points for work that is more than 24 hours late. If there is any question about what ought to be allowed, we will send it over to the Dean of Students for further investigation.

Exams

There will be two exams for the course scheduled in the regular class time and each exam will be worth 30% of the course grade. Exam 1 and 2 are closed-book exams in which you cannot solicit help from other sources/people and you only have a limited time to complete them. The final exam is in the format of a project which you will have two weeks to work on.

Make-up exams

Make up exams will be allowed ONLY with prior permission from the instructor. Exceptions will be identified by the instructor when appropriate.

Class Participation Score

All students are required to attend classes. In-class activities will be used to calculate attendance score. Details will be discussed during the first meeting.

Accommodations for Disabilities:

If you have an accommodation form, please present it during the first two weeks of class. No retroactive accommodations will be made. If you are an official note-taker, you must present documentation of this the first two weeks of class if any accommodation will be requested.

Class Break

We will have a break during each meeting, at the approximate half-way mark. It's a good time to check your messages, use the restroom, or have a quick snack.

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

“As a Comet, I pledge honesty, integrity, and service in all that I do.”

Academic Support Resources

The information contained in the following link lists the University's academic support resources for all students. Please go to [Academic Support Resources](#) webpage for these policies.

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus.

Please go to [UT Dallas Syllabus Policies](#) webpage for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor. If you have questions about this syllabus, ask. Never assume.