

## Course Syllabus – Summer 2021

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### COVID-19 Guidelines and Resources

The following guidelines and resources outline expectations for students and instructors of record during the Summer 2021 semester.

### Instructor Resources

#### Syllabi Language for Faculty: Masks and Vaccinations

For faculty who would like to include information in your syllabus about the university's policy on masks and vaccinations, you may use the developed language shown below. The inclusion of this language in your syllabus is not required and is at the discretion of the instructor of record. Please remember that Texas Governor Greg Abbott's Executive Order [GA-38](#) prohibits us from mandating vaccines and face coverings for UT Dallas employees, students and members of the public on our campus. However, we strongly encourage all Comets to get vaccinated and wear face coverings as recommended by the CDC. The University of Texas at Dallas (UT Dallas) will continue to share more information and guidance as we get closer to the fall semester.

**Classroom Safety and COVID-19** To help preserve the University's in-person learning environment, UT Dallas recommends the following:

All Comets are strongly encouraged to wear face coverings indoors regardless of vaccination status. Please note this represents a change in the [campus guidance](#) issued on May 20, 2021.

Commented [VV1]:

#### Accommodations for Students Who Miss Class for Reasons Unrelated to COVID-19

Individual faculty maintain their discretion on whether and how to accommodate student absences unrelated to COVID-19.

#### Accommodations for Students Who Must Isolate or Quarantine Due to COVID-19

To keep the UT Dallas community as safe as possible, the University requires students who test positive for COVID-19 or who are close contacts as determined by the campus contact tracing program to isolate or quarantine as applicable. Faculty will be notified by the Dean of Students' Office if a student in their class has been required to isolate (positive case) or quarantine (exposed). Faculty must make lectures available for those students during the period the students must isolate or quarantine. Faculty who need assistance with providing these students access to course content can contact the eLearning Team at [elearning@utdallas.edu](mailto:elearning@utdallas.edu). Faculty have the discretion to set an attendance policy for their in-person meetings, but the absences due to COVID-19 cannot be counted against an isolated or quarantined student.

#### Verifying COVID-19 Isolations or Quarantines

Students need to self-report COVID-19 positive results or exposures via an [online form](#) so that university campus tracers can verify, record, and take necessary campus precautions. When faculty are notified by students rather than by the Dean of Students'

Office that the students are isolating or quarantining, the faculty should remind students to self-report via the form; students should not attend class until cleared by campus tracers.

Vaccinations are widely available, free and not billed to health insurance. The vaccine will help protect against the transmission of the virus to others and reduce serious symptoms in those who are vaccinated. You are encouraged to [get a COVID-19 vaccine](#) and register your vaccination status through the [voluntary vaccine report form](#).

Proactive Community Testing remains an important part of the university's efforts to protect our community. Tests are fast and free. Please check the [Comets United](#) webpage for additional information.

[Student Safety](#) remains an important part of the UT Dallas' efforts to protect our community. All students will adhere to the Comet Commitment. Unvaccinated Comets will be expected to complete the mandatory [Required Daily Health Screening](#). Those students who do not comply will be referred to the Office of Community Standards and Conduct for disciplinary action under the [Student Code of Conduct – UTSP5003](#). All students are encouraged to read the [Recommendations for Students Returning to Campus](#) issued on August 2, 2021.

Visit [Comets United webpage](#) to obtain the latest information on the University's guidance and resources for campus health and safety.

[Previous Campus Communications](#): a list of university announcements made in 2020-2021.

[Registrar's Intranet](#): please log in with your UTD NetID and password to access this site. Information that faculty need about grading, scheduling, and other essential aspects of our responsibilities related to teaching are made available and updated regularly in the Registrar's Intranet. This source of information can only be accessed by logging in with your UTD NetID and password. Many important faculty questions are answered here, and this is information that faculty members are expected to know and understand.

[FERPA Guidelines](#): you will be asked to log in before you access the FERPA Guidelines webpage on the Registrar's Intranet. If faculty have additional questions about FERPA guidance, please contact the Office of the Registrar at [records@utdallas.edu](mailto:records@utdallas.edu) for the proper student consent forms and further instructions.

[Honorlock](#): Online proctoring tool will be available for fully online courses and for classes with enrolled international students who are not yet in the United States.

[UT System Resources for Creating Accessible Course Content](#): designed to assist faculty with developing course content

## **Student Resources**

Students who have tested positive for COVID-19 or may have been exposed should not attend class in person and should instead follow required disclosure notifications as posted on the university's website (see "[What should I do if I become sick?](#)")

### COVID-19 Resources

[Comets United webpage](#): check frequently

[FAQ](#): check out the FAQs and reach out to your instructor or academic advisor if answers are not included

[Student Resources](#): a variety of resources are available to help students to obtain counseling, health care, and academic support.

### Course Information

Course Prefix, Number, Section	CS 4375.0U2
Course Title	Introduction to Machine Learning
Term	Summer 2021
Days & Times	Fri 8:30AM – 12:30PM

### Professor Contact Information

Professor	Vincent Ng
Office Phone	(972)883-4581
Other Phone	
Email Address	vince@hlt.utdallas.edu
Office Location	ECSS 3.404
Office Hours	Fri 1:00-1:30PM (held on MS Teams)
Other Information	

*Note: state time/day and how office hours will be held, e.g., BlackBoard Collaborate or MS Teams (add appropriate links), and/or phone call – optional; please ensure student's identity in adherence to FERPA*

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

CS 3341 Probability and Statistics in Computer Science (Data science majors must have taken the equivalent of CS 3341)

CS 3345 Data Structures and Algorithms

### Course Description

Machine learning is concerned with the question of how to construct programs that automatically improve their performance through experience. This course introduces the principles underlying the design of existing supervised and unsupervised machine learning algorithms. Topics to be covered include the following:

1. **Supervised learning models and methods**: Decision trees, neural networks, nearest-neighbor algorithms, Bayesian learning, hidden Markov models, bagging, boosting
2. **Unsupervised learning**: Clustering
3. **Reinforcement learning**: Markov Decision Processes, online supervised learning, certainty equivalent learning, temporal difference learning, Q-learning

**General techniques:** Feature selection, cross-validation, maximum likelihood estimation, expectation-maximization, gradient descent

### Student Learning Objectives/Outcomes

Ability to understand and apply the following concepts in machine learning:

1. Decision trees
2. Neural networks
3. Bayesian learning
4. Instance-based Learning
5. Hidden Markov models
6. Clustering
7. Reinforcement learning

### Required Textbooks and Materials

*Required Texts*

There is no required text.

*Required Materials*

### Suggested Course Materials

*Suggested Readings/Texts*

Machine Learning, Tom M. Mitchell, McGraw Hill, 1997.

Artificial Intelligence: A Modern Approach (second/third edition), Stuart Russell and Peter Norvig, Prentice Hall, 2003/2010.

*Suggested Materials*

### Assignments & Academic Calendar

*Topics, Reading Assignments, Due Dates, Exam Dates*

- |             |  |
|-------------|--|
| <b>5/28</b> | Administrivia, course overview, Decision trees 1                                     |
| <b>6/4</b>  | Decision trees 2 & Bayesian Learning 1   |
| <b>6/11</b> | Bayesian Learning 2  |
| <b>6/18</b> | Markov Decision Processes  |
| <b>6/25</b> | Reinforcement Learning 1 & Midterm 1   |
| <b>7/2</b>  | Reinforcement Learning 2   |
| <b>7/9</b>  | Neural Networks  |
| <b>7/16</b> | Instance-Based Learning, Clustering, Maximum Likelihood Estimation, the EM Algorithm |
| <b>7/23</b> | Hidden Markov Models 1   |
| <b>7/30</b> | Hidden Markov Models 2 & Midterm 2   |
| <b>8/6</b>  | Final Exam   |

### Classroom Conduct Requirements Related to Public Health Measures

UT Dallas will follow the public health and safety guidelines put forth by the Centers for Disease Control and Prevention (CDC), the Texas Department of State Health Services (DSHS), and local public health agencies that are in effect at that time during the Fall 2021 semester to the extent allowed by state governance. Texas Governor Greg Abbott's Executive Order [GA-38](#) prohibits us from mandating vaccines and face coverings for UT Dallas employees, students, and members of the public on campus. However, we strongly

encourage all Comets to get vaccinated and wear face coverings as recommended by the CDC. Check the [Comets United: Latest Updates webpage](#) for the latest guidance on the University's public health measures. Comets are expected to carry out [Student Safety](#) protocols in adherence to the Comet Commitment. Unvaccinated Comets will be expected to complete the [Required Daily Health Screening](#). Those students who do not comply will be referred to the Office of Community Standards and Conduct for disciplinary action under the [Student Code of Conduct – UTSP5003](#).

### **Grading Policy**

**Homework assignments:** 30% of the course grade

**Midterms:** 40% of the course grade

**Final exam:** 30% of the course grade

### **Course Policies**

#### *Make-up exams*

**No makeup exams** at a later/earlier date will be scheduled for any student unless a written medical note is provided.

#### *Extra Credit*

None

#### *Late Work*

Barring extenuating circumstances, all problem sets must be turned in on the date specified. Assignments turned in within 24 hours of the due date will receive 90% of its score. Assignments turned in within 48 hours of the due date will receive 70% of its score. Assignments more than 48 hours late will not be accepted.

#### *Special Assignments*

None

#### *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 AccessAbility accommodation. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

#### *Class Attendance*

The University's attendance policy requirement is that individual faculty set their course attendance requirements. Regular and punctual class attendance is expected. Students who fail to attend class regularly are inviting scholastic difficulty. In some courses, instructors may have special attendance requirements; these should be made known to students during the first week of classes. Faculty have the discretion to set an attendance policy for their in-person meetings, but the absences due to COVID-19 cannot be counted against a quarantined student.

### *Class Participation*

*Regular class participation is expected 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 also includes engaging in group or other activities during class that solicit your feedback on homework assignments, readings, or materials covered in the lectures (and/or labs). Class participation is documented by faculty. 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*

Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the Office of Student Accessibility 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 Accessibility accommodation. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

**NOTE: if the instructor records any part of the course, then the instructor will need to add the following syllabus statement:**

The instructor may record meetings of this course. These recordings will be made available to all students registered for this class if the intent is to supplement the classroom experience. 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.

### *Classroom Citizenship*

None

### **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 see <http://go.utdallas.edu/academic-support-resources>.

## **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 review the catalog sections regarding the [credit/no credit](#) or [pass/fail](#) grading option and withdrawal from class.

Please go to <http://go.utdallas.edu/syllabus-policies> for these policies.

*The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.*