



## *Course Syllabus*

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### **Course Information**

CS 4375 Introduction to Machine Learning Section: 0U2

Day/Time: M/W 3:00 – 5:15 pm

Location: JSOM 12.214

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### **Professor Contact Information**

Dr. Karen Mazidi

Email: Karen.Mazidi@utdallas.edu

Office: ECSS 3.203

Office phone: 972-883-3868

Office hours: Monday and Wednesday, 5:30 – 6:30 pm

### **TA Information**

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### **Class Resources**

We will use Piazza for class discussion, announcements, exam reminders, course materials, and homework instructions. Rather than emailing questions to me or the TA, I encourage you to post your questions on Piazza so that everyone has the same information. Piazza also has a free android/iphone app

Sign up here: <https://piazza.com/utdallas/summer2018/cs4375mazidi/home>

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### **Course Pre-requisites**

CS/SE 3341 (Probability and Statistics in CS) and CE/CS/SE/TE 3345 (Data Structures and Algorithms)

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### **Course Description**

CS 4375 Introduction to Machine Learning (3 semester credit hours) Algorithms for creating computer programs that can improve their performance through learning. Topics include: cross-validation, decision trees, neural nets, statistical tests, Bayesian learning, computational learning theory, instance-based learning, reinforcement learning, bagging, boosting, support vector machines, Hidden Markov Models, clustering, and semi-supervised and unsupervised learning techniques.

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### **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

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### Required Materials:

Install R first (<https://www.r-project.org/>)  
and then the free version of Rstudio (<https://www.rstudio.com/products/RStudio/#Desktop>)

Course Materials are available on my github:  
[https://github.com/kjmazidi/Learning\\_from\\_Data](https://github.com/kjmazidi/Learning_from_Data)

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### Course Topics:

- Course introduction
- Getting starting with R
- Linear regression
- Logistic regression
- Instance based learning with kNN
- Unsupervised learning: k-means, hierarchical clustering
- Naïve Bayes
- SVM
- Decision Trees
- Neural Networks
- Bayes Nets
- Markov Models and Reinforcement Learning

### Important Dates

- First day of class: Monday May 21
- Last day of class: Wednesday August 1
- Memorial day holiday: Monday May 28
- Independence day holiday: Wednesday July 4
- Exam: Thursday 8/2 or Friday 8/5 (to be determined)

### Grading Policy

- Assignments (15% of the course grade): There will be approximately 6 homework assignments. You will have at least a 1-week time frame for completion.
- Projects 1 and 2 (15% of the course grade each).
- Mid-term exams (2) (each is 15% of the course grade).
- Final exam (20% of the course grade).
- Class attendance/participation (5%).

Letter grades will be assigned as follows (using default eLearning settings):

Below 60 is an F

100 is an A+

Otherwise:

Grades ending in 7,8,9 are +

Grades ending in 0,1,2,3 are –

Grades ending in 4,5,6 are neither + nor –

Note: I don't round; for example, an 89.7 is a B+

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### **Professionalism (Course Ground Rules)**

- **Reliability.**
  - Work should be completed on time. Late assignments are deducted by 10% on the first and second days late. After two days, the assignment will not be accepted.
- **Accountability.**
  - If you do not agree with a grade you have been given, you must make your case within a week of receiving the grade or the grade stands as is.
- **Responsibility.**
  - Makeup exams are not given unless prior permission has been granted due to extenuating circumstances. Exam are not given early to individual students unless there are medical issues.
- **Communication.**
  - Please let me know if you are having problems in the class. Talk to me before class, after class, or in office hours. Don't wait until the point of no return to seek advice. You can also email me.
- **Service and community.**
  - When you participate in class discussion, answer questions and demo your code when called on or when you volunteer, you are providing a service to the class. We all know more together than any of us knows alone. Class discussions also let you get to know your peers. Students who network with their peers are usually more successful than those who don't.
- **Dependability.**
  - Show up! According to CS Department policy, 3 consecutive absences leads to one letter grade drop. Four consecutive absences lead to an F.
- **Integrity.**
  - Do not turn in programming code or other work that is not your own. This will result in a referred to the Office of Academic Integrity. Discussion and collaboration are good things, turning in someone else's work as your own is not.

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### **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.”*

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### **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 <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.***