COURSE SYLLABUS

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YEAR COURSE OFFERED: 2019

SEMESTER COURSE OFFERED: Spring

DEPARTMENT: Computer Science

COURSE NUMBER: COSC 6397 (16224)

NAME OF COURSE: Introduction to Data Mining and Machine Learning

NAME OF INSTRUCTOR: Giulia Toti

CREDITS: 3 (3 hours of lesson per week)

TIME AND LOCATION: Mo/We 1-2:30PM, room SEC 201

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The information contained in this class syllabus is subject to change without notice. Students are expected to be aware of any additional course policies presented by the instructor during the course.

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Learning Objectives

This course is designed to introduce students to the ever growing fields of Data Mining and Machine Learning, which are becoming pervasive in the academic and industrial environments, with more applications being developed every day. These tools can be applied to a vast range of problems, from extracting knowledge hidden in large databases to making predictions of future trends.

At the end of the course, students will be able to:
- Identify suitable problems that can be solved using data analysis
- Develop models capable of learning and extracting information from data
- Evaluate the effectiveness of a model and interpret data analysis results
- Apply the concepts introduced in this course to real world data sets using KNIME

Prerequisites:

Math 5385 or consent of instructor

COURSE SYLLABUS

Course Content

- Introduction to Data Analysis
- Introduction to Data Visualization
- Introduction to KNIME
- Exploratory Data Analysis - how to Visualize and Compute Basic Statistics for Datasets and how to Interpret the Findings
- Data Types and Feature Engineering
- Data Preprocessing
- Linear and logistic regression
- Introduction to Clustering
- Introduction to Supervised Learning: Basic Concepts and Decision Trees
- More on Supervised Learning: Bayes classifiers, Support Vector Machines, Neural Networks
- Bias/variance tradeoff
- Documenting and presenting Data Analysis results

Grading

The following grading plan is tentative and subject to changes. Look out for updates in Blackboard or in-class announcements.

Assignments (3)	50%
Exam 1	15%
Exam 2	15%
Exam 3	20%
Total	100%

Grading scale

A >= 92.5 Excellent	A- >= 89.5 and < 92.5 Outstanding	B+ >= 86.5 and < 89.5 Very Good
B >= 83.5 and < 86.5 Good	B- >= 79.5 and < 83.5 Above Average	C+ >=76.5 and < 79.5 High Average
C >=72.5 and < 76.5 Average	C- >= 69.5 and < 72.5 Low Average	D+ >=65.5 and < 69.5 Below Average
D >= 62.5 and < 65.5 Poor	F < 62.5 Failing	

COURSE SYLLABUS

CLASS RULES:

- Our time together is very valuable; please treat it accordingly. By enrolling in this course you make a personal contract with me and your classmates to attend and diligently participate in every class activity. Students are expected to be courteous toward the instructor and their classmates throughout the duration of this course.
- All cell phones must be on silent mode during classes and turned off during exams.
- You are responsible for the content and correct delivery of your assignment submission.
- If a student misses an exam/assignment for significant personal reasons, he or she may make up for the lost points in an **optional comprehensive final exam. This is the only option allowed in this class.** Significant personal reasons include medical emergencies or other unexpected accidents. Trips/vacations planned during the semester do not constitute a valid reason, since your presence is required for the entire duration of the semester.
- **3-Day Policy:** every student has 3 days starting from the time in which the graded assignment/exam papers have been distributed and/or posted in order to object to the score of that assignment or exam.
- **Academic Honor Code:** as a student, you join a community of scholars who are committed to excellence in learning. I assume that students will pursue their studies with integrity and honesty. **ZERO-TOLERANCE for CHEATING, whether in exams, homeworks or PROGRAMMING ASSIGNMENTS.** Plagiarism, copying and other anti-intellectual behavior are prohibited by the university regulations. Violators will face serious consequences. **It is each student's responsibility to read and understand the Academic Honesty Policy found in the Student Handbook (**http://www.uh.edu/academics/catalog/policies/academ-reg/academic-honesty/**).**
- **Plagiarism is using someone else's work without proper acknowledgement. This includes getting help from a friend or colleague and online material. When using someone else's work, always cite the source. Plagiarism is considered a serious breach of academic integrity. ANY BREACH OF ACADEMIC INTEGRITY OR PLAGIARISM WOULD RESULT IN A MINIMUM OF ONE FULL LETTER GRADE REDUCTION OVER THE FINAL SCORE AND POSSIBLE EXPLUSION FROM UNIVERSITY.**

Instructor Contact and Office Hours

- gtoti@uh.edu
- TBA

Textbook

TBA

COURSE SYLLABUS

Required software

Most recent version of KNIME Analytics Platform (free desktop version):

https://www.knime.com/knime-software

Counseling and Psychological Services (CAPS) statement

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS (www.uh.edu/caps) by calling 713-743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. No appointment is necessary for the "Let's Talk" program, a drop-in consultation service at convenient locations and hours around campus.
http://www.uh.edu/caps/outreach/lets_talk.html