New Jersey Institute of Technology

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Spring 2023

CS 301: Introduction to Data Science

Islam Akm

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CS 301 - Introduction to Data Science
Course Syllabus for Spring 2023

Instructor: Akm Islam (azi3@njit.edu)
Office Hours:
Wednesday: 11.30am - 12.10pm
Tuesday/Thursday: 5.10pm - 5.50pm
Location: GITC 5714

Course Overview
This is an introductory data science course that introduces students what data science is and what data scientists do. The course will explore some real world datasets and teach students how to engineer them for their appropriate use in data driven decision making as well as in machine learning. There are two parts in this course. The first part focuses on data analysis and visualization, and the second part focuses on the use of data in decision making and in machine learning.

Prerequisite: CS 114, Math 333

Topics to Be Covered:
The list of topics to be covered includes the following:
- Data Analysis and Visualization
- Data Engineering and Preprocessing
- Regression
- Classification
- Clustering
- Tree Based Algorithms
- Neural Networks
- Interpretable AI

Course Outcome:
By the end of the course, students will be able to:
- Perform analysis on noisy and large dataset;
- Engineer the data for their best use;
- Build predictive models;
- Perform correlation and clustering analysis;
- Identify appropriate machine learning model for a particular problem;
- Explain the outcome of a model;

Course Resources
There is no specific textbook required for this course. However, the majority of the materials will come from the following books:
- Python for Data Analysis (2nd Edition) - by Wes McKinney - Github Repository
- Data Science from Scratch: First Principles with Python - by Joel Grus - Github Repository
- Hands On Machine Learning with Scikit Learn Keras and Tensorflow (2nd Edition) - by Aurelien Geron - Github Repository
- Interpretable Machine Learning: A Guide for Making Black Box Models Explainable - by Christoph Molnar - Link

Class Attendance

Class attendance is mandatory. Getting to class late or leaving early counts as absence. If you are unable to attend for some valid reasons, you must submit proper documentation to the dean of students. You will be excused once they deem the reason as valid.

Assignments

Assignments must be submitted through Canvas (and when specified in hard copy) by the due date. It will not be accepted late except for special circumstances (such as jury duty or medical problem), for which you have to provide documentation to the dean of students office and they must approve it.

Projects

There will be two projects in this course. Students will work in groups and present their work during the specified dates and times.

Exams

There are two exams in this course - Midterm and Final. You must bring ID to all exams. Students with special needs are advised to make arrangements with the Office of Accessibility Resources and Services. There are no makeup exams. If you miss an exam because of a documented special circumstance you may receive a grade based on the other exam or based on the average performance on the other parts of the course.

Class Participation

Asking and answering questions, taking quizzes, solving problems — individually or in groups — is a regular part of class meetings. Cell phones must be turned off during class. During class time you may not play games, text, email, browse the web or engage in other activities that are not part of the class. Any violation will be reported to the dean of students office.

Course Communication

Canvas (canvas.njit.edu) will be used to post lecture notes and to submit homeworks. For other communications, we will use slack. You will receive the invitation to join the slack channel as soon as the semester starts. It is highly recommended that you install slack on your phone for easy access.

Overall Course Score Formula

Attendance   5%
Assignment   20%
Quiz   10%
Project   20%
Midterm Exam   20%
Final Exam   25%

The letter grade is based on the overall course score.

Grade Formula						
Grade	A	B+	B	C+	C	D
Overall Course Score Cutoff	90	85	80	75	70	60

Grade Appeals

If you believe that you deserve more credit than you have been awarded on a particular problem, you may request, **at the time it is returned or within 48 hours of the grade being posted**, that it be re-graded. Your entire assignment will be re-graded, which may result in points being **added or subtracted.**

University Code on Academic Integrity

Read the University Code on Academic Integrity (njit.edu/policies/sites/policies/files/academic-integrity-code.pdf). It describes infractions of academic integrity and penalties for violations, including, for the most serious violations, an XF grade in the course or expulsion. **All work that you represent as your own must, in fact, be your own.** Work done by others must be given proper credit.

I reserve the right to make small changes to this syllabus; if there is any modification, you will be informed during the semester.