New Jersey Institute of Technology

Digital Commons @ NJIT

Fall 2023

CS 301: Introduction to Data Science

Akm Islam

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

Instructor: Akm Islam (azi3@njit.edu)
Office Hours:
Tuesday: 5.10pm - 5.50pm
Wednesday: 10am - 10.40am (Online - [Webex Link](#))
If these hours do not work with your schedule, appointments are also available by email.
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

Course Outcome:

By the end of the course, students will be able to:
- Perform analysis on noisy and large datasets.
- Engineer the data for their best use.
- Build predictive models.
- Perform correlation and clustering analysis.
- Identify appropriate machine learning models 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, and you are highly advised to read the selected chapters of the books along with the lecture notes:
- Python for Data Analysis (2nd Edition) - by Wes McKinney - [GitHub Repository](#)
- Introduction to Statistical learning (any edition) - [Link](#)
- Hands On Machine Learning with Scikit Learn Keras and Tensorflow (2nd Edition) - by Aurelien Geron - [GitHub Repository](#)

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. Students who miss more than 3 classes (unexcused) will have their grade reduced by a letter grade.

Assignments

Assignments must be submitted through Canvas 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.

Quizzes

Quizzes will be given to test fundamental concepts. There will be two types of quizzes: regular quizzes and pop quizzes. Pop quizzes will be given at the beginning of the class or at the end of the class.

Project

There will be two projects in this course. Students will work individually in their first project and in groups in their second project. The project requirements and deliverables will be discussed in class and will be posted on canvas.

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 any other communications, we will use **Discord**. You will receive the invitation to join the discord server as soon as the semester starts. It is highly recommended that you install discord on your phone for easy access. Extra credit assignments will only be announced on discord.

Overall Course Score Formula

Attendance	10%
Assignment	15%
Quiz	10%
Project 1	5%
Project 2	10%
Midterm Exam	20%
Final Exam	30%

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.