CS-GY 6033 Design and Analysis of Algorithms CF01
Spring 2021
NYU Tandon School of Engineering
Instructor: Erin McLeish

General Information:
This course if offered *online*, through NYU classes. All course material, lecture notes, video content, practice problems as well as the class forum can be found there.

Instructor:
Students can contact the instructor *anytime* by email or directly through NYU classes, or by making an appointment during the online "office hours". Reaching out for help or questions on any of the practice material is strongly encouraged since this is an online course.

Office hours:
Office hours are held online with ZOOM. The schedule is posted on Classes. If you are not available during the scheduled time, please feel free to ask to schedule on another day. Before the midterm and exam, additional office hours will be organized.

Topics:
Data structures, priority queues, binary search trees, balanced search trees. Algorithm design and analysis techniques illustrated in searching and sorting: heapsort, quicksort, sorting in linear time, medians and order statistics. Design and analysis techniques: dynamic programming, greedy algorithms. Graph algorithms: elementary graph algorithms (breadth first search, depth first search, topological sort, connected components, strongly connected components), minimum spanning tree, shortest path. Geometric algorithms. Brief introduction to NP completeness.

Course Material:
The material for the course will be provided on NYU classes and will include lecture notes and videos. The textbook below is an excellent reference, and most of the material can be found in this book. However, we will not cover *all* the material in the text below.

Introduction to Algorithms, 3rd edition, by Cormen, Leiserson, Rivest and Stein
(often referred to as CLRS)

Exams:
There will be 3 exams, each consisting of both an oral and a written component.
Exam 1 - week of March 1st.
Exam 2 - week of April 5th
Exam 3 - during Final exam period.

Homework:
There will be 3 graded homework assignments in this class. The assignments are written and completed individually. The homework due dates will be the week before the exams.

Practice Problem Participation:

Practice problems are posted each week on Classes, which correspond to that week's material. These problems are fundamental to the learning process of the week's topics. Each student is responsible for posting a solution to **two problems** during the term. Participating in sharing problem solutions is worth 5% of your final grade.

Live sessions:

There are weekly live sessions. It is during these sessions that we go over the details from the weekly course material and demonstrate how they are applied to practice problems. Students are strongly encouraged to attend live and take advantage by asking questions. We review the solutions to the practice problems, and the students get feedback for the solutions they have posted during the week.

Grading Scheme:

Homework 20%
Practice Problem participation 5%
Exam 1 25%
Exam 2 25%
Exam 3 25%

Final grade:

85+ A
80 - 84: A-
75-79: B+
70-74: B
65-69: B-
60-64: C+
55-59: C
Below 55: F