Northeastern University
College of Engineering

Info: 6205: Program Structures and Algorithms SPRING 2022

INSTRUCTOR: Ashish
ashish@northeastern.edu

Office Hours: After class or by appointment

TA's: To be announced.

TA Hours: Hours and locations are TBA, we would be having TA hours (Code Labs) 4 times every week, for 1.5 - 2 hours every week.

Course Description: In this course, we will discuss the fundamentals of programming data structures and basic algorithms. We will cover data structures of arrays, linked lists, stacks and queues, hash tables and hash maps, trees, graphs, suffix trees, and few other specialized data structures. We would also learn about the order of complexity for each one of these data structures. In addition to this, we would be discussing searching and sorting, backtracking, dynamic programming, bit manipulation, pattern searching etc.

Prerequisite: Basic understanding of any high-level programming language.

Grading: TA's would be grading all the assignments and tracking attendance for code labs.

Assignments: 50% (One assignment every week)

Mid Term: 15% (Two Midterms Take home)

Final 15%

Code Labs attendance and participation: 20 %

Academic Honesty: The Northeastern University academic integrity policy applies to your work in this course. All students are expected to adhere to this policy. For more information on academic integrity policy, please visit website: http://www.northeastern.edu/osccr/academicintegrity/index.html

Attendance policy: The Information Systems Department has a strict class attendance policy. Students who miss two or more Classes will automatically receive one letter grade lower in their final grade.

Course Schedule:

Date	**Topic**
Week 1	Program complexity, Searching and Sorting
Week 2	Searching and Sorting continued
Week 3	Searching and Sorting + Tree Basics
Week 4	Binary Trees + Binary Search Tree
Week 5	BST + Suffix Trees, Heap, B+ Tree, Self Balancing Trees
Week 6	Mid Term (Take Home) + Link List, Stack Queues, Skip list
Week 7	Backtracking + Recursion
Week 8	Dynamic Programming
Week 9	Dynamic Programming
Week 10	Graph
Week 11	Graph
Week 12	Graph + Bit Manipulation
Week 13	Matrix, String Arrays

Week 14	Anything else
Week 15	Finals(Take Home)