

Course: Design and analysis of algorithms

Course Code: noc21-cs22

Session: 2020-21

Duration: 8 Weeks

Assessment procedures: Weekly Assignment (25%) + proctored certification Exam (75%)

Curriculum of the Course:

Week 1:

- Module 1: Introduction
- Module 2: Examples and motivation
- Module 3: Examples and motivation
- Module 4: Asymptotic complexity: informal concepts
- Module 5: Asymptotic complexity: formal notation
- Module 6: Asymptotic complexity: examples
- Assignments MCQ/Fill in blanks (unique answer)

Week 2:

- Module 1: Searching in list: binary search
- Module 2: Sorting: insertion sort
- Module 3: Sorting: selection sort
- Module 4: Sorting: merge sort
- Module 5: Sorting: quicksort
- Module 6: Sorting: stability and other issues
- Assignments MCQ/Fill in blanks
- programming assignment

Week 3:

- Module 1: Graphs: Motivation
- Module 2: Graph exploration: BFS
- Module 3: Graph exploration: DFS
- Module 4: DFS numbering and applications
- Module 5: Directed acyclic graphs
- Module 6: Directed acyclic graphs
- Assignments MCQ/Fill in blanks
- programming assignment

Week 4:

- Module 1: Shortest paths: unweighted and weighted
- Module 2: Single source shortest paths: Dijkstra
- Module 3: Single source shortest paths: Dijkstra
- Module 4: Minimum cost spanning trees: Prim's algorithm
- Module 5: Minimum cost spanning trees: Kruskal's Algorithm
- Module 6: Union-Find data structure

- Assignments MCQ/Fill in blanks
- programming assignment

Week 5:

- Module 1: Divide and conquer: counting inversions
- Module 2: Divide and conquer: nearest pair of points
- Module 3: Priority queues, heaps
- Module 4: Priority queues, heaps
- Module 5: Dijkstra/Prims revisited using heaps
- Module 6: Search Trees: Introduction
- Assignments MCQ/Fill in blanks
- programming assignment

Week 6:

- Module 1: Search Trees: Traversals, insertions, deletions
- Module 2: Search Trees: Balancing
- Module 3: Greedy : Interval scheduling
- Module 4: Greedy : Proof strategies
- Module 5: Greedy : Huffman coding
- Module 6: Dynamic Programming: weighted interval scheduling
- Assignments MCQ/Fill in blanks
- programming assignment

Week 7:

- Module 1: Dynamic Programming: memoization
- Module 2: Dynamic Programming: edit distance
- Module 3: Dynamic Programming: longest ascending subsequence
- Module 4: Dynamic Programming: matrix multiplication
- Module 5: Dynamic Programming: shortest paths: Bellman Ford
- Module 6: Dynamic Programming: shortest paths: Floyd Warshall
- Assignments MCQ/Fill in blanks,
- programming assignment

Week 8:

- Module 1: Intractability: NP completeness
- Module 2: Intractability: reductions
- Module 3: Intractability: examples
- Module 4: Intractability: more examples
- Module 5: Misc topics
- Module 6: Misc topics
- Assignments MCQ/Fill in blanks

List of students enrolled

S. No	Name of Student
1	Uma Agarwal
2	Amit Sharma

3	Ankit Saini
4	Arihant Pokharna
5	Arpita Dubey
6	Aryan Sharma
7	Mansi Kanwar
8	Gaurav Kumar
9	Gaurav Jangid
10	Harsh Modi
11	Harsh Jain
12	Ishika Agarwal
13	Lavanya Jain
14	Kalpana Modi
15	Kartik Dusad
16	Komal Jha
17	Mayank Pant
18	Nitin Jain
19	Priya Singh Raghav
20	Dhruv Raj Naruka
21	Jagrati Sharma
22	Shruti Dubey
23	Shubham Soni
24	Suraj Sharma
25	Suryapratapsingh
26	Sachin Yadav