



# EAST DELTA UNIVERSITY (EDU)

Course Outline-Spring 2021

School of Science, Engineering and Technology

Department: Computer Science and Engineering (CSE)

Program: B.Sc. in CSE

Course Title: **Algorithms**

Course Code: **CSE 221**

Instructor: **Muntasir Hoq**

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## Course Description

This course includes:

Techniques for analysis of algorithms; Methods for the design of efficient algorithms: divide and conquer, greedy method, dynamic programming, back tracking, branch and bound; Basic search and traversal techniques; Topological sorting; Connected components, spanning trees, shortest paths; Flow algorithms; Approximation algorithms; Parallel algorithms; Algebraic simplification and transformations; Lower bound theory; NP-completeness, NP-hard and NP-complete problems.

## Course Objective

After studying this course, students should be able to understand:

- ☐ Analyse different algorithms
- ☐ Implement different algorithms to solve new problems

Lecture No	Contents
1	Introduction
2	Asymptotic notation
3	Divide and conquer
4	Merge sort and Quick sort
5	Master Theorem
6	Linear time sorting
7	<b>Class Test 1</b>
8	Heap sort
9	Priority queue
10	Binary Search Tree
11	Graph algorithms basics
12	BFS and DFS
13	<b>Mid Term</b>
14	Minimum spanning trees
15	Shortest paths: DAG
16	Dijkstra's algorithm
17	Kruskal's algorithm
18	<b>Class Test 2</b>
19	Greedy algorithms
20	Greedy algorithms
21	Dynamic Programming
22	Dynamic Programming
23	Np-completeness
24	Review Class

### Course Materials

#### **Textbook:**

**“Introduction to Algorithms”** by

Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein, MIT Press, 3rd Edition

#### **Online Materials:**

Will be provided when needed.

**Course Requirements/Marks Distributions:**

Class Attendance	5
Assignment	20
Class Test	10
Continuous Assessment	15
Midterm	25
Final Term	25
<b><i>Total</i></b>	<b>100</b>

**Grading Policy**

<b>Performance (Marks)</b>	<b>Letter Grades</b>	<b>G.P.A.</b>
93% & above	A	4.0
89% - <93%	A-	3.7
86% - <89%	B+	3.3
82% - <86%	B	3.0
79% - <82%	B-	2.7
75% - <79%	C+	2.3
72% - <75%	C	2.0
69% - <72%	C-	1.7
65% - <69%	D+	1.3
60% - <65%	D	1.0
<60%	F	0.0

### Other Class Information

**Class Attendance:** Class attendance is the easiest way to get 10 marks. The students have to enter into the classroom within 15 minutes of class commencement.

**Class tests & term examinations:** The class tests will be taken with prior notification. Students will be informed at least before one week in case of term exams. Make-ups for missed exams will only be allowed for a university approved excuse in writing.

**Assignments:** Assignments must be submitted on or before the deadline. Late submission will lead to 25% deduction of marks or in certain cases cancellation of the works.

**Mobile Phone:** Use of mobile phone is strictly prohibited in the classroom during the class hours.

**Scholastic Dishonesty:** Since its' inception EDU has focused on value based education. To maintain academic integrity copying work done by others, in or out of class, is considered as an act of scholastic dishonesty and will be prosecuted to the full extent allowed by University policy.