International Institute of Information Technology, Bangalore
CS 511 Algorithms
31, July 2023.

1 Syllabus

Book : Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein.

First 26 , chapters of the book.

2 Schedule

Monday 9:30 AM, Wednesday 9:30 AM and Monday : 2 PM.

Most of the classes will be held in R 203. Some of the tutorials will be held in R203/R101/R105.

Programming Tests and Quizzes will be held in R106/R107/R108.

3 Grading Scheme.

All the exams will be open notes exam. The End/Mid Term exams will be open notes/book exam.

Book : Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein.

1. MidTerm Exam 15%
2. EndTerm Exam 15%
3. Quizzes 15 % -There will be 2 quizzes , of 15 marks each. Average of the two will be considered.

   These will be held on 21, September and 30, November.
4. Class Tests 25%.

   There will be 6 tests carrying 5 marks each and best five will be considered.
5. Programming Tests 30%

The following table indicates maximum marks required to obtain the respective grades. The actual grades will be decided, at the end of the semester after completing all the evaluations.

A	80%
B	60%
C	40%
D	20%

4 Programming

There are Four modules for programming. You can write code in C/C++/Java/Python, but C++ is preferred.

For each module, there will be one test for 2 hours for 15 marks. There will be 3 questions , one easy (3 marks), one medium (5 marks) and one hard (7 marks). Module tests will carry 30% weightage to final grade. Best of three out of four, each test carry 10 marks will be considered.

4.1 Data Structures,Time and Space Complexity and Sorting

Linked Lists, Stacks and Queues, Fibonacci number modulo 100, Binary Search, Merge Sort and Quick Sort, kth Largest number, sliding windows, two pointer methods.

Test on 28, August 2023.

4.2 Data Structures

Binary Trees. Binary Heap. Segment Tree and Binary Index Tree. Binary Search Tree and AVL Tree.

Test on 18, September 2023.

4.3 Greedy Algorithms and Dynamic Programming

Test on 30, October 2023.

4.4 Graph Algorithms

BFS and DFS and applications

Shortest path Algorithms - Dijkstra's, Bellmen-Ford, Floyd Warshall.

Minimum/Maximum Spanning Trees-Prim's and Krushkal's Algorithms.

Test on 27, November 2023.