

# Advanced Data Structures

**Instructor:** M.V. Padmini  
**Class Schedule:** Tuesday 1.30 – 3 pm and Thursday 1.30 – 3 pm  
**Location:** TBD  
**Lab time/location:** TBD  
**Office Hours:** between 10 am and 3 pm on working days by appointment  
**E-mail:** [mvpadmini@utt.edu.tt](mailto:mvpadmini@utt.edu.tt)  
**Course URL:** [www.u.tt/ict](http://www.u.tt/ict)

This course presumes adequate undergraduate knowledge of Data Structures. The course will provide a comprehensive and technical treatment to some of the advanced structures like RB Trees, Graphs, Efficient Sorting and Searching techniques, Hashing, Queues and Heaps.

**Pre-requisite** Undergraduate Data Structures

**Assessment** (No late assignments will be accepted. You will have to get 50% marks in each of the above three components of examination. In case you do not, you automatically fail even if your aggregate score is more than 50%.)

<b>Assignments</b>	<b>40 %</b>	
<b>Two Midterm Exams</b>	<b>15 %</b>	each
<b>Final Exam</b>	<b>30 %</b>	
<b>Bonus marks</b>	<b>20%</b>	for extra work that will be given at the beginning of the term and is due for submission at the end.

## Reference Material

- Cormen et al. Introduction to Algorithms, 2nd Edition. (CLRS), McGraw-Hill, ISBN 0070131511
- Horowitz et al. Fundamentals of Data Structures, 2nd Edition, Silicon Press, ISBN 0929306376

## Course Schedule

Week No.	Topics	Task	Time
Week1, Sept. 9,11	Data Structures Revisited	Assignment 1 – Group activity	One weeks
Week 2, Sept. 16,18	Red Black Trees and Interval Trees	Assignment 2 – Group activity	Two weeks
Week 3, Sept. 23,25	Graphs – DFS, BFS, Spanning trees, Shortest Path		
Week 4, Sept. 30, Oct. 2	External sorting	Assignment 3 – Group activity	Two weeks
Week 5, Oct. 7,9	B-Trees		
Week 6, Oct. 14,16	Tries	Assignment 4 – Group activity	Two weeks
Week 7, Oct. 21,23	Hashing		
Week 8, Oct. 28,30	Priority Queues – Leftist trees	Assignment 5 – Group activity	Four weeks
Week 9, Nov. 4,6	Binomial trees, Binomial heaps		
Week 10, Nov. 11,13	Fibonacci heaps		
Week 11, Nov. 18,20	Technical discussions for presentation		
Week 12, Nov. 25,27	Presentation		