Week	Topic	Lecture	Tutorial	Lab	
1	Algorithm complexity and algorithmic approaches	Course outline. Algorithm analysis	Asymptotic notation	Asymptotic analysis practice	
2		Elementary data structures (EDS)	Amortised analysis + Practice	Implementation of EDS (TA Choice) + HW Practice	
3		Hashing; Chaining; Open addressing	Analysis of runtime in hashing	Implementation and application of Hashing	
4		Algorithm strategies; Divide-and-conquer; Recursion	Solving recurrences; Substitution method; Master method	Solving recurrences practice	Assignment (Implementation and Application of EDS, Hashing) + (Theoretical questions on Algorithm Analysis + Recurrences) -- (20%)
5		Dynamic Programming, Longest Common Subsequence	Examples of dynamic programming	Dynamic Programming practice	
6	Sorting algorithms and trees	Midterm (20 %)			
7		Sorting algorithms (Comparison sorting)	Integer sorting (Counting, Radix and Bucket sorting)	Quicksort	
8		Tree ADT, Binary Search Trees, Tree Walks	Properties of randomly built BST, Red-black trees	AVL Trees	
9		Priority Queue and Binary Heap	2-3 Trees, B-trees, Fibonacci Heap	Heapsort	Theoretical Assignment -- (10%)
10	Graphs	Graphs and graphs representations	Time and memory complexity of graph representations	Implementation of Graph Representations	
11		BFS, DFS	Analysis of BFS and DFS	Topological Sorting; + something extra since TS is simple	
12		Greedy Algorithms, Minimum Spanning Trees and Prim's Algorithm	Krushkal's algorithm	Implementation and application of Prim's and Kruskal's	
13		Shortest paths I: Dijkstra	Shortest paths II: Bellman-Ford and Floyd-Warshall	Implementation and application of Dijkstra	Assignment (Implementation and application of BF and FW) + (Theoretical questions about graphs) -- (20%)
14		Flow network, Max Flow, Residual Networks, Ford-Fulkerson, Cuts	Edmond-Karp, Max-flow min-cut theorem	Max flow Practice	
15		*Recap+*	*Recap+*	*Recap+*	
			FINAL (20%)		
			Attendance (5% Tutorial, 5% Labs)		