CSCI 230 OUTLINE
DATA STRUCTURES II
TEXT: A Practical Introcution to Data Structures and Algorithm Analysis
By: Clifford Shaffer, 3rd ED, Dover

Approved: OCTOBER 2012   **Effective: SPRING 2013**

MATERIAL TO BE COVERED	SECTIONS FROM TEXT	TIME LINE
Internal Sorting: $O(n^2)$ sorting algorithms (insertion, bubble, and selection), shell sort, $O(n\log n)$ sorting algorithms (quick sort, merge sort, and heap sort), special sorting algorithms (bin sort and radix sort), empirical comparison of sorting algorithms, lower bound for sorting	7.1 - 7.9	8 Hours
File processing and external sorting: primary vs. secondary storage, disk drive architecture and dist access costs, buffers and buffer pools, programmer's view of files, external sort, replacement selection, multiway merging	8.1 - 8.5	5 Hours
Searching unsorted ans sorted arrays: self-organizing lists, searching in sets, hashing, hash functions, open hashing, closed hashing	9.1 - 9.4	5 Hours
Indexing: linear indexing, ISAM, tree indexing, 2-3 trees, B-trees, B$^+$-trees, B-tree analysis	10.1 - 10.5	4 Hours
Graphs: terminology, applications, representations (adjacency matrix and adjecency list), graph implementations, graph traversals (depth first search and breadth first search), topoligical sort, shortest path problems, single-source shortest paths (Dijkstra's algorithm), minimum-cost spanning trees, Prim's algorithm, Kruskal's algorithm	11.1 - 11.5	9 Hours
Lists and arrays: multi-lists, matrix representations, memory management-dynamic storage alloation, failure policies, and garbage collection	12.1 - 12.3	2.5 Hours
Analysis techniques: summation techniques, recurrenece relations, estimating upper and lower bounds, expanding recurrences, divide and conquer recurrences, amortized analysis	14.1 - 14.3	2.5 Hours
Lower bounds, pattern of algorithms: dynamic programming (knapsack, Floyd), radomized algorithms (skip lists), numerical algorithms, limits to computation: reductions, hard problem, NP-completeness, impossible problems	15.1 - 15.7 & 16.1 - 16.3 & 17.1 - 17.3	4 Hours

* Denotes recommended book

*** 1 Hours = 1 hour of face time. ****This outline allows for 3 hours review and exams.

   16 Week Term: 1 week = 2.8333 hours (face time)   6 Week Term: 1 week = 7.5 hours (face time)

Submitted by: Pop