TAKE AWAYS FROM COURSE ON

"ALGORITHMS, DISCRETE STRUCTURES AND DATA STRUCTURES"

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- Kulkarni V.Y. (MIT Pune)
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Following concepts have internalized well.

- Mapping between problems
(HC-> TSP, DHC -> HC, ATSP->TSP,
  Job Scheduling -> TSP).

- Importance of TSP and the variations in it such as Euclidean TSP and approximation algorithms for TSP such as Assignment problem, MST, Christophedes etc.

- NP Completeness theory was covered to our satisfaction and has helped consolidate our understanding

DISCRETE MATHEMATICS

- All concepts like Number Theory, Trees, Probability, Permutations and Combinations, Relations all to be taught with examples in Computer Science.
(Relations -> Databases, Probability -> Spam Filtering etc)

- Makes a strong case to argue with Departmental chair that this course should be taught by faculty of Computer Science rather than Mathematics Department

DATA STRUCTURES

- Not to focus too much on data structures like union-find, Leftist heaps, Binomial queue etc that do not have too many applications.

- Teach this course using C, not Java.

- Stability and in-place properties of sorting algorithms.

ALGORITHMS

- Average case analysis very important as most practical implementations rarely move towards Worst case.
for eg (quick sort, random trees, Euclidean TSP etc)

- Network flow problems very important and ought to be covered in the syllabus.

- STABLE MARRIAGE PROBLEM. A fantastic way to begin this course.

- Longest Common Subsequence problem as a very interesting and important problem under DYNAMIC PROGRAMMING Strategy

GENERAL OBSERVATIONS

- Class room activities (after every 15 minutes) very important to bring the focus of the student to the class.

- History of various computer scientists like Alan Turing, Dijkstra etc. This would be very interesting and inspiring to students.

- Use of PPTs, along with chalk-board very suitable to teach all courses.

RESEARCH IDEAS

- Various ideas given in the realm of algorithms.

- Digital Hall Project was indeed very interesting.

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