

OPRE 6385 Scheduling R.Chandrasekaran

Text: Computer & Job Shop Scheduling Theory, Edward G. Coffman (Ed),
J. Wiley, 1976.

Topics:

1. Introduction to Deterministic Scheduling Theory
 - (a) Performance Measures
 - (b) Preemptive vs. Nonpreemptive Schedules
 - (c) Taxonomy of Problems
 - (d) Sequencing vs. Scheduling Problems
 - (e) Flow Shops, Open Shops, Job Shops
2. Single Machine Problems
 - (a) Makespan
 - (b) Average Flow Time
 - (c) Maximum Tardiness Minimization
 - (d) Moore Problem
3. Parallel Machines
 - (a) Divisibility Issues
 - (b) Makespan
 - (c) Average Flow Time
 - (d) Uniform Machines
 - (e) Unrelated Machines
4. Precedence Constrained Systems
 - (a) Makespan
 - i. T.C. Hu's Algorithm for UET with Tree Structured Precedences
 - ii. Coffman-Graham Algorithm for UET with Two Machines
 - iii. FKN's Matching Formulation
 - (b) Mean Flow Time
 - i. Decomposition Algorithm
5. Complexity of Scheduling Problems

- (a) NP-Completeness
- (b) Fully Polynomial Approximation Schemes
- (c) Bin Packing, Dual Bin Packing and Polynomial Algorithms
- (d) Barany's Algorithm For Flowshop Problems
- (e) Tardiness Problem
- (f) Traveling Salesperson Problems and their Relationship to Scheduling
- (g) Branch and Bound, Neighborhood Search and other Enumerative Techniques
- (h) Dynamic Programming and its use in Scheduling

6. On-line Algorithms