1) Scheduling in multiprocessors
2) Memory Hierarchy
3) Synchronization
4) Concurrency Control - Deadlocks
5) Fault Tolerance
6) Data Parallel Programming Model
7) Scalability Studies
8) Parallel Model - PRAM (notion of optimal algorithm), BSP
9) Distributed memory message passing systems
10) Shared Memory Programming Models - Threads, Processes
11) Tasks
12) Dependence Graphs and program transformations
13) Primitive Operations - element operations, reductions, recurrences
14) Basic Linear Algebra - Matrix multiplication, Jacobi relaxation, solving systems of linear equations.
15) Parallel programming tools - IDEs, Matlab, Debuggers, Intel Parallel Studio
16) Parallel I/O
17) Applications
18) Tools - Cuda, Cilk, gdb, pixie, prof, threads,
19) Machine Classifications - SIMD, MIMD
20) Fundamental Parallel Algorithms - Sorting, Grpah Algorithms
21) Parallel Programming - Exercises
22) Parallel Algorithm Design Technique - Divide and Conquer
23) Interconnection topology - hypercubes, meshes
24) Heterogeneity
25) Uncertainty
26) Load Balancing
27) Memory Consistency Model
28) Asynchronous Computation
29) Partitioning
30) Determinacy
31) Amdahl's Law
32) Scalability and performance studies
33) Vectorization and parallelization
34) Survey of programming languages - shared memory, distributed memory, functional data flow, logic, MPI, Global Arrays
35) Modularity
36) Speculative Computing
37) Power – sinks, control methods