Massachusetts Institute of Technology
Department of Electrical Engineering and Computer Science

6.826 – Principles of Computer Systems

Handout 2 September 13, 1993

Tentative Course Schedule

Week 1 :

Monday 9/13: Lecture 1

Introduction, overview, administrivia. Abstraction; specification versus implementation. State machine semantics. Example problems and solution techniques.

Wednesday 9/15: Lecture 2

Specification and correctness for sequential programs. Rep invariants and abstraction mappings.

Week 2 :

Monday 9/20: Lecture 3

Specification and implementation of simple sequential file system; use of caching; use of logs for crash recovery (single directory file system; redo only).

Wednesday 9/22: Lecture 4

Simple file system (continued).

Week 3 :

Monday 9/27: Lecture 5

Language semantics, history variables, miscellaneous semantics.

Wednesday 9/29: Lecture 6

Performance issues.

Week 4 :

Monday 10/4: Lecture 7

Introduction to concurrency: need for atomicity; implementation techniques (critical sections, mutexes). Specification and implementation of mutexes and condition variables.

Wednesday 10/6: Lecture 8

Concurrent programming examples (continued). Safety vs. liveness. Hints for writing specifications. Issues in concurrent programs: deadlock, starvation, livelock, priority. Pragmatics.

Week 5 :

Monday 10/11: No class (Columbus Day)

Wednesday 10/13: Lecture 9

Concurrent programming examples; proofs based on invariants and abstraction mappings.

Week 6 :

Monday 10/18: Lecture 10

Naming issues.

Wednesday 10/20: Lecture 11

Synchronization alternatives for concurrent use of file systems.

Week 7 :

Monday 10/25: Lecture 12

Sequential transactions with caching.

Wednesday 10/27: Lecture 13

Concurrent transactions: specification; concurrency control alternatives; recovery.

Week 8 :

Monday 11/1: Lecture 14

Introduction to distributed systems.

Wednesday 11/3: Lecture 15

Distributed systems: networks.

Week 9 :

Monday 11/8: Lecture 16

Distributed systems: reliable messages.

Wednesday 11/10: Lecture 17

Remote Procedure Call (RPC).

Week 10 :

Monday 11/15: Lecture 18

Distributed agreement; replicated state machines.

Wednesday 11/17: Lecture 19
Distributed transactions.

Week 11 :

Monday 11/22: Lecture 20
Replication and availability.

Wednesday 11/24: Lecture 21
Security.

Week 12 :

Monday 11/29: Lecture 22
Security.

Wednesday 12/1: Lecture 23
Management issues in large systems.

Week 13 :

Monday 12/6: Lecture 24
Caching in distributed and multiprocessor systems.

Wednesday 12/8: Lecture 25
Caching (continued); final wrapup.

Week 14 : 12/13–17 — Final exams.