

COURSE DESCRIPTION

Department and Course Number: COMP 6500

Course Title: Distributed Operating Systems

Total Credits: 3

Required: No

Prerequisites: COMP 4320

Class meetings per week: 3 hours

Lab meetings per week: 0 hours

Course Coordinator: Dr. Alvin Lim

Date Prepared: February 18, 2004

Current Catalog Description:

Basic concepts of distributed systems. Concurrent process communication and synchronization mechanisms, distributed process scheduling, distributed file systems, distributed shared memory, distributed system security, and case studies.

Textbooks:

Milojicic, Dejan et al. (eds.). 1999. *Mobility: Processes, Computers, and Agents*. Addison-Wesley. ISBN 0-201-37928-7.

Coulouris, George et al. 2001. *Distributed Systems: Concepts and Design, 3rd Edition*. Addison-Wesley. ISBN 0-201-61918-0.

References:

Imielinski, T., and Korth, H. (eds.). 1996. *Mobile Computing*. Kluwer Academic Publishers. ISBN 0-7923-9697-9.

Course Objectives:

1. Gain an understanding of issues associated with distributed computing systems.
2. Prepare students to become proficient in building concrete mobile computing systems.

Prerequisites by Topic:

1. Operating systems
2. Resource management
3. Computer networks

Topics Covered: (specify number of hours on each)

1. Pervasive and mobile computing (3 hours)
2. Large-scale sensor networks (3 hours)
3. Networked sensor system architecture (3 hours)
4. Wireless LANs (3 hours)
5. Ad-hoc network rerouting (3 hours)
6. Distributed computing systems – concepts and foundations (3 hours)
7. Lookup services (3 hours)

8. Distributed and mobile file systems (3 hours)
9. Mobile middleware (3 hours)
10. Security in sensor networks (3 hours)
11. Mobile agents (3 hours)
12. Real-time communication (3 hours)
13. Querying sensor networks (3 hours)
14. Mobile databases (3 hours)
15. Exams (3 hours)

Laboratory Projects: (specify number of weeks on each)

1. Three programming projects, four weeks each.
Or (student's choice)
2. Three survey or design projects, four weeks each.

Oral and Written Communications:

None.

Social and Ethical Issues:

None.

Theoretical Content:

Fundamentals of distributed systems are presented in focused lessons (3 hours) and then applied as appropriate throughout the course.

Problem Analysis and Solution Design:

Programming projects are significant and relate to mobile computing systems. Each programming project involves significant design, implementation, benchmarking, and evaluation. While not culminating in a software artifact, design projects are non-trivial and require students focus on problem analysis and solution design for mobile systems. The result of each project is a research paper that contains an in-depth discussion of design problems, design criteria, concepts, substantial evidence for choosing among alternative design methods, comparison with other systems, and convincing arguments of why the student's proposed design is superior to other alternatives.