Operating Systems

Class time and location

Tuesday and Thursday, 03:35PM – 4:50 PM, LOV 103

Instructor and Grader

- Instructor: Xiuwen Liu
- Email: liux@cs.fsu.edu (strongly preferred)
- Home page: http://www.cs.fsu.edu/~liux
- Office: 166 Love Building (LOV)   Phone: (850) 644-0050
- Office Hours: Tuesday and Thursday 9:30-11:00 AM and by appointments
- Grader: To be announced

Course Home Page

http://www.cs.fsu.edu/~liux/courses/cop5611/
This web page contains the up-to-date information related to this course such as news, announcements, assignments, lecture notes, and useful links to resources that are helpful to this class. Announcements on this web page are OFFICIAL for this class and you are required to visit this web site on a regular basis. Besides the course home page, an email mailing list will also be established and used to post changes and updates.

Course Description

This course covers the theoretical principles and practical paradigms of distributed operating systems. Topics include architectures of distributed systems, distributed mutual exclusion, distributed deadlock detection, distributed file systems, distributed shared memory, security and protection in distributed systems, failure recovery and fault tolerance, and paradigms implementing distributed systems, which include multiprocessor operating systems, distributed object-based systems, distributed document-based and coordination-based operating systems, and database operating systems.

Prerequisites

CDA 3101 – Computer Organizations; COP 4610 - Operating Systems and Concurrent Programming; Programming proficiency in C/C++; Analytical skills of algorithms.

Course Objectives

Upon successful completion of this course of study a student:

- Understands the theoretical and technical issues in distributed operating systems.
- Understands and knows how to apply the algorithms in distributed mutual exclusion and distributed deadlock detection.
- Understands the principles of designing distributed file systems.

- Understands the technical issues in protection and security of distributed systems and knows the principles of different approaches.
- Understand the basic principles in fault tolerance and the basic approaches in failure recovery.
- Understands the principles of and knows the advantages and disadvantages of different implementations of distributed systems.
- Understands the technical issues in database operating systems.
- Knows the current technical issues and challenges and research topics in distributed operating systems.
- Has some programming experience in distributed operating systems.

Textbook and Class Materials

"*Advanced Concepts in Operating Systems*", McGraw-Hill, 1994, by Mukesh Singhal and Niranjan G. Shivaratri, required (Lectures on theoretical aspects and algorithms will be based on this book).

"*Distributed Systems: Principles and Paradigms*," Prentice Hall, 2002 by A. S. Tanenbaum and Maarten van Steen, recommended (Paradigms adopted in practice and recent advances will be based on this book).

In addition to the textbook, papers and notes from the literature will be distributed along the lectures to reflect the most recent developments.

Student Responsibilities

Attendance is required for this class. In case that it is necessary to skip a class, students are responsible to make up missed materials. Participation of in-class discussions and activities is also required. All submitted assignments and projects must be done by the author(s). It is a violation of the Academic Honor Code (see below) to submit other's work and the instructor of this course takes the violations very seriously.

Assignments and Projects

About five homework assignments will be given along the lectures and they need to be turned in. There will be two programming projects, which will be done in C/C++ and a term paper on technical issues in distributed operating systems. There will be several quizzes given randomly with or without prior notice.

Grading Policy

Grades will be determined as follows:

Assignment	Points	Assignment	Points
Homework Assignments	15 %	Term Paper	5 %
Quizzes	10 %	Midterm	20 %
Programming Project I	10 %	Final exam (cumulative) (5:30-7:30pm, April 29, 2003)	30 %
Programming Project II	10 %		

Grading will be based on the weighted average as specified above and the following scale will be used (suppose the weighted average is *S* in 100 scale)

Score	Grade	Score	Grade	Score	Grade
$93 \leq S$	A	$80 \leq S < 83$	B-	$67 \leq S < 70$	D+
$90 \leq S < 93$	A-	$77 \leq S < 80$	C+	$63 \leq S < 67$	D
$87 \leq S < 90$	B+	$73 \leq S < 77$	C	$60 \leq S < 63$	D-
$83 \leq S < 87$	B	$70 \leq S < 73$	C-	$S < 60$	F

Late Penalties

Assignments are due at the beginning of the class on the due date. Assignments turned in late, but before the beginning of the next scheduled class will be penalized by 10 %. Assignments that are more than one class period late will **NOT** be accepted.

Submission and Return Policy
All exams/assignments/projects/homework will be returned as soon as possible after grading.

Tentative Schedule

- Week 1:
    - Review of classical operating systems.
    - Theoretical and practical issues in distributed operating systems.
- Week 2: Architectures of distributed systems.
- Weeks 3-4: Theoretical foundations of distributed systems.
- Week 5: Distributed mutual exclusion.
- Week 6: Distributed deadlock detection and agreement protocols.
- Week 7: Distributed file systems.
- Week 8: Distributed shared memory.
- Week 9: Distributed scheduling.
- Week 10: Spring break.
- Week 11: Failure recovery and fault tolerance.
- Week 12: Protection and security in distributed systems.
- Week 13: Multiprocessor operating systems.
- Week 14: Distributed object-based systems.
- Week 15: Distributed document-based and coordination-based operating systems.
- Week 16: Issues in database operating systems and summary.
- April 29, 2003: Final examination (5:30 – 7:30 PM).

Academic Honor Code
Assignments/projects/quizzes/exams are to be done individually, unless specified otherwise. It is a violation of the Academic Honor Code to take credit for the work done by other people. It is

also a violation to assist another person in violating the Code (See the FSU Student Handbook for penalties for violations of the Honor Code.). The judgment for the violation of the Academic Honor Code will be done by the instructor and a third part member (another faculty member in the Computer Science Department not involved in this course). Once the judgment is made, the case is closed and no arguments from the involved parties will be heard. Examples of cheating behaviors include:

- Discuss the solution for a homework question.
- Copy programs for programming assignments.
- Use and submit existing programs/reports on the world wide web as written assignments.
- Submit programs/reports/assignments done by a third party, including hired and contracted.
- Plagiarize sentences/paragraphs from others without giving the appropriate references. Plagiarism is a serious intellectual crime and the consequences can be very substantial.

Penalty for violating the Academic Honor Code: A 0 grade for the particular assignment/quiz/exam and a reduction of one letter grade in the final grade for all parties involved for each occurrence. A report will be sent to the department chairman for further administrative actions.

Accommodation for Disabilities

Students with disabilities needing academic accommodations should: 1. Register with and provide documentation to the Student Disability Resource Center (SDRC); 2. Bring a letter to the instructor from the SDRC indicating you need academic accommodations. This should be done within the first week of class. *This syllabus and other class materials are available in alternative format upon request.*

For more information about services available to FSU students with disabilities, contact the Assistant Dean of Students:

> Student Disability Resource Center
> 08 Kellum Hall
> Florida State University
> Tallahassee, FL 32306-4066
> e-mail: sdrc@admin.fsu.edu
> phone: (850) 644-9566.