

Course Number and Title:

CS 5323, Design and Implementation of Operating Systems II

Time: 2:30-3:45 MW *Place:* MSCS 310 and T-NCB 211

Instructor: M. Samadzadeh *Office:* MSCS 215 *Phone:* 744-5674

Office Hours: 11:30-12:15 Monday, Tuesday, Wednesday, Thursday, Friday,
or by appointment if necessary

TA: Sukanya Suwisuthikasem *Office:* MSCS 225 *Phone:* 744-9552

E-mail Address: suwisut@cs.okstate.edu

Office Hours: 1:00:-2:30 Monday, 10:30-11:30 Tuesday, 1:00-2:30 Wednesday,
or by appointment if necessary

Prerequisite: CS 4323, Design and Implementation of Operating Systems I

Primary Text: Gary J. Nutt, *Centralized and Distributed Operating Systems*, Prentice-Hall, Englewood Cliffs, NJ, 1992 or 91.

(For course material, you need to rely primarily on the notes taken in class which will not be available on the Web or anywhere else. The above text may be out of print, however it is readily available from sources other than the original publisher. This text is generally closest to what I would like to cover. A number of the homework sets will be based on it.)

Optional/Recommended Texts, etc.:

1. Hagit Attiya and Jennifer Welch, *Distributed Computing: Fundamentals, Simulations, and Advanced Topics*, 2nd edition, John Wiley & Sons, Inc., Hoboken, NJ, 2004.
2. Andrew S. Tanenbaum and Maarten van Steen, *Distributed Systems: Principles and Paradigms*, 2nd edition, Pearson Prentice Hall, Upper Saddle River, NJ, 2007.
3. Ananth Grama, Anshul Gupta, George Karypis, and Vipin Kumar, *Introduction to Parallel Computing*, 2nd edition, Pearson/Addison-Wesley, New York, NY, 2003.
4. MengChu Zhou and Maria Pia Fanti (editors), *Deadlock Resolution in Computer-Integrated Systems*, Marcel Dekker/CRC Press, New York, NY, 2005.
5. Jean Bacon and Tim Harris, *Operating Systems: Concurrent and Distributed Software Design*, Addison-Wesley and Pearson Education, Harlow, England, 2003.
6. Doreen L. Galli, *Distributed Operating Systems: Concepts and Practice*, Prentice-Hall, Inc., Upper Saddle River, NJ, 2000.
7. Mukesh Singhal and Niranjana G. Shivaratri, *Advanced Concepts in Operating Systems*, McGraw-Hill, Inc., New York, NY, 1994.
8. Lubomir F. Bic and Alan C. Shaw, *Operating System Principles*, Pearson Education, Inc., Prentice Hall, Upper Saddle River, NJ, 2003.
9. M. Maekawa, A. E. Oldehoeft, and R. R. Oldehoeft, *Operating Systems: Advanced Concepts*, The Benjamin/Cummings Publishing Co., Inc., 1987, Menlo Park, CA.
10. Peter Brucker, *Scheduling Algorithms*, Springer-Verlag, Heidelberg, Germany, 1998.

11. Gregory R. Andrews, *Foundations of Multithreaded, Parallel, and Distributed Programming*, Addison Wesley Longman, Inc., Reading, MA, 2000.
12. M. Ben-Ari, *Principles of Concurrent Programming*, Prentice/Hall International, Inc., Englewood Cliffs, NJ, 1990.
13. R. Chow and T. Johnson, *Distributed Operating Systems an Algorithms*, Addison Wesley Longman, Inc., Reading, MA, 1997.
14. Rene David and Hassane Alla, *Petri Nets and Grafcet: Tools for Modelling Discrete Event Systems*, Prentice Hall, New York, NY, 1992.
15. C. A. R. Hoare (Editor), *Developments in Concurrency and Communication*, Addison-Wesley Publishing Company, Reading, MA, 1990.
16. Joseph JaJa, *An Introduction to Parallel Algorithms*, Addison-Wesley Publishing Company, Inc., Reading, MA, 1992.
17. Michael Pineto, *Scheduling: Theory, Algorithms, and Systems*, Prentice-Hall, Inc., a Simon & Schuster Company, Englewood Cliffs, NJ, 1995.
18. Charles Crowley, *Operating Systems: A Design-Oriented Approach*, IRWIN, Chicago, IL, 1997.
19. Lester R. Lipsky, *Queueing Theory: A Linear Algebraic Approach*, Macmillan Publishing Company, New York, NY, 1992.
20. George Coulouris, Jean Dollimore, and Tim Kindberg, *Distributed Systems: Concepts and Design*, fourth edition, Addison-Wesley Publishing Company, Menlo Park, CA, 2005.
21. A. M. Lister and R. D. Eager, *Fundamentals of Operating Systems*, Fifth Edition, Springer Verlag, New York, NY, 1993.
22. Stephen J. Hartley, *Operating Systems Programming*, Oxford University Press, New York, NY, 1995.
23. Various Periodicals and Technical Publications, e.g., ACM SIGOPS, Association for Computing Machinery, Special Interest Group on Operating Systems, Operating Systems Review, and Proceedings of ASPLOS (Architectural Support for Programming Languages and Operating Systems).

Course Description: Task systems and concurrent programming. Synchronization and inter-process communication. Theoretical investigation of resource sharing and deadlock. Memory management strategies. Deterministic scheduling algorithms and queueing theory. Distributed operating systems.

<i>Grading:</i>	Project	35%
	Assignments	10%
	Tests (3)	10% each (February 1, February 29, April 4)
	Final Exam	25% comprehensive (April 30, 2:00-3:50 PM)

Letter Grades: [90-100] A, [80-90) B, [70-80) C, [60-70) D, [0-60) F

Notes:

(1) OS-II is a core course. It is not unusual for a core course to be the main academic focus of a semester for a graduate student, the reason being that typically core courses place a larger demand on a student's time than non-core courses. Your thesis/dissertation work or what you get paid to do for your research assistantship are certainly important, but not to the detriment of your performance in your courses and especially in your core courses.

(2) Announcements about assignments, project due dates, etc. will be made in class and/or by CSX email. Students are to check their CSX email regularly using their class account, i.e., `userid@cs.okstate.edu`. All course-related email communication is to be done using CSX email. Please note that your CSX email is not the same as your okstate email.

Passwords for new accounts on CSX are the PR&SM passwords (PR&SM = Password Reset and System Management) that students can get via their O-Key accounts. If you have a new CSX account, you should use your PR&SM password.

Students are responsible for all announcements made in class and/or by email. Students are to either check their class account email on CSX regularly or to put an appropriate forwarding mechanism in place to make sure to read their class-related email.

For CSX accounts, CSX email, and other Computer Science Department general computer problems, report the problem using the form available at the URL <http://sysmgr.cs.okstate.edu/> or send email to `systems.group@cs.okstate.edu`.

(3) Assignments are due at the beginning of class on the date they are due, unless announced in class otherwise. Homework assignments are to be submitted in hard copies, i.e., on paper. The "word processing and formatting" of the assignments is preferred and recommended but not required. Assignment legibility is a requirement. Late assignments will not be accepted. Only when verifiable extenuating circumstances can be demonstrated will make-up exams or extended assignment due dates be considered. Verifiable extenuating circumstances must be reasons beyond control of the students, such as illness or accidental injury. Poor performance in class is not an extenuating circumstance. Advise your instructor of the verifiable extenuating circumstances in advance or as soon as possible. In such situations, the date and nature of the make-up exams, the extended due dates for the assignments, etc. will be decided by the instructor.

(4) A general point about assignments and tests: It is understood and it is always the case that you must justify your answers, show all your work, and state your assumptions on all problems and exercises in the assignments and examinations. A correct answer with no justification and no work shown may be worth less than a wrong answer with full justification and having shown all the work.

(5) Cell phones must be turned off during class and in examination sessions. Computer use, i.e., the use of a laptop, tablet, smart phone, etc., is not allowed in class unless a clear and convincing case is made for the use of one.

(6) For OSU-Tulsa students, North Hall 103 is the student submission and pick-up office.

Attendance Policy:

(1) Attendance is strongly encouraged, but not required or monitored. Students are responsible for all material covered in class. Some of the material covered in class will not be in the text book.

(2) Taking a course as a remote student is not the same as taking a correspondence course or taking an on-line course. For this course, the lectures are broadcast to the remote site(s) but the recordings are not going to be available. This course is not asynchronous, it has a pace and progress rate that must be followed by all students. The deadlines and due dates apply to all students.

(3) Attending this class requires registration or formal audit, no informal "sitting in" is allowed.

Collaboration Policy for CS 5323

Assignments: Discussion of any kind is allowed. After discussion, each student must write up her/his own solution. Copying another student's work is not allowed. Giving another student your work is considered cheating as well.

Project: Discussion of techniques in a natural language (such as English) is allowed, but a discussion in a computer or algorithmic language is not allowed. Computer language discussions and questions are to be limited to the language and should not concern the assignment. Stealing, giving or receiving any code, drawings, diagrams, texts, or designs is not allowed. Every line of work that you turn in must be your own.

Examinations: No discussion of any kind (except with the instructor) is allowed. No access to any type of written material is allowed.

Students who **do not** comply with the described collaboration policy will receive a grade of F in the course. Furthermore, the case will be reported to the University Officials.

Attachments:

- General Use and Misuse Policy - Computer Science Department
<http://cs.okstate.edu/cspolicy.html>
- Academic Dishonesty Policy
<http://cs.okstate.edu/cspolicy.html>
- Disabilities Act
<http://cs.okstate.edu/cspolicy.html>
- Academic Integrity Policy
<http://cs.okstate.edu/cspolicy.html>
- Oklahoma State University, Syllabus Attachment, Spring 2012
<http://academicaffairs.okstate.edu/images/documents/sylatspr.pdf>
- Oklahoma State University - Tulsa, Addendum to Syllabus Attachment, Spring 2012
<http://cs.okstate.edu/~samad/5323/Spr12-Tulsa-Syl-Att.pdf>
- Spring 2012 Final Examination Schedule
http://registrar.okstate.edu/index.php?option=com_content&view=article&id=417