

## CS 150 – Distributed Systems

### Spring 2007 Syllabus

<b>Content:</b>	This course examines fundamental concepts and paradigms of distributed systems. Topics include communication services; client/server model; CORBA; web services; .NET and J2EE; failures and fault-tolerance; membership; group communication; ordering; synchrony and asynchrony; and ongoing research efforts at Westmont in survivable distributed systems. Online course materials may be found at <a href="https://eureka.westmont.edu/">https://eureka.westmont.edu/</a> .
<b>Goals and Learning Standards:</b>	(1) Understand fundamental concepts of distributed systems design and implementation; become familiar with and engage in current research efforts ( <i>research and technology standard</i> ) (1) Understand issues of system reliability, security, and survivability and how these issues effect human safety, financial security, and other critical aspects of society ( <i>critical-interdisciplinary thinking standard</i> ) (3) Learn to communicate technical information effectively through oral presentations and written assignments and papers ( <i>written and oral communication standard</i> )
<b>Professor:</b>	Dr. Kim Kihlstrom <a href="mailto:kimkihls@westmont.edu">kimkihls@westmont.edu</a> <a href="http://homepage.westmont.edu/kimkihls/">http://homepage.westmont.edu/kimkihls/</a> Office: Math/CS Building (near post office) 565-6864 Home: 684 Circle Drive 969-6265
<b>Office Hours:</b>	M 1:30-3:30 pm, TW 3:15-4:45 pm
<b>Required Text:</b>	Birman, <a href="#"><i>Reliable Distributed Systems: Technologies, Web Services, and Applications</i></a> , Springer, 2005
<b>Class Sessions:</b>	Regular class attendance is essential for success in the class, and class participation is included in the grading. Class sessions will include free-writes, discussion of principles and ideas, abstraction, algorithm development, group problem solving, and programming labs. We will use laptop computers in class; thus, you need to bring your laptop to class each day. If you do not own a laptop, you may check one out for the semester. Additionally, each student must attend at least two natural and behavioral science seminars during the semester, typically held on Fridays at 3:30.
<b>Exams:</b>	There will be a midterm and a cumulative final, which will be in-class open book exams. The exams will stress both qualitative understanding of the concepts and the ability to write code.

<p><b>Assignments:</b></p>	<p>Reading assignments are to be done <b>before</b> the class period for which they are assigned. At the beginning of most class sessions, students will be asked to write a segment of code or a response to a question based on the reading. These free-writes will form the basis for further class discussion.</p> <p>Homework assignments will be due about once a week. All assignments are to be submitted online through Eureka. Late assignments will be subject to a 50% penalty. <b>Your code must compile to receive credit.</b> Grading will take into account correctness, programming style, and documentation.</p> <p>A larger programming project that includes a final paper will be due during the last week of class. Additionally, each student will make several oral presentations on course material.</p>												
<p><b>Grades:</b></p>	<p>The percentages of grading will be as follows:</p> <table border="0"> <tr> <td>Homework assignments:</td> <td>20%</td> </tr> <tr> <td>Class participation and seminar attendance:</td> <td>15%</td> </tr> <tr> <td>Midterm:</td> <td>15%</td> </tr> <tr> <td>Oral Presentations</td> <td>15%</td> </tr> <tr> <td>Project/Paper:</td> <td>15%</td> </tr> <tr> <td>Final exam:</td> <td>20%</td> </tr> </table>	Homework assignments:	20%	Class participation and seminar attendance:	15%	Midterm:	15%	Oral Presentations	15%	Project/Paper:	15%	Final exam:	20%
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<p><b>Honesty:</b></p>	<p>Working together on assignments is encouraged. However, <b>copying</b> another student's assignment (or portion of an assignment) is <b>not</b> allowed and will result in an F for the assignment. If you work together, you must include a <b>comment</b> indicating with whom you worked and on which part of your assignment. <b>Your code should never be the same or essentially the same as someone else's!</b> Repeated or major violations will result in an F for the course.</p> <p>“To plagiarize is to present someone else's work—his or her words, line of thought, or organizational structure—as our own. This occurs when sources are not cited properly, or when permission is not obtained from the original author to use his or her work. By not acknowledging the sources that are used in our work, we are wrongfully taking material that is not our own. Plagiarism is thus an insidious and disruptive form of dishonesty. It violates relationships with known classmates and professors, and it violates the legal rights of people we may never meet.</p> <p>Another person's ‘work’ can take many forms: printed or electronic copies of computer programs, musical compositions, drawings, paintings, oral presentations, papers, essays, articles or chapters, statistical data, tables or figures, etc. (The Learning Skills Centre, 1999). In short, if any information that can be considered the intellectual property of another is used without acknowledging the original source properly, this is plagiarism.” From Westmont College Plagiarism Policy,  <a href="http://www.westmont.edu/academics/pages/provost/curriculum/plagiarism/">http://www.westmont.edu/academics/pages/provost/curriculum/plagiarism/</a></p>												

## COURSE OUTLINE

### Weeks 1-8

Text: Birman, [\*Reliable Distributed Systems: Technologies, Web Services, and Applications\*](#)

Week/Date	Topic	Chapter/Pages	
<b>#1</b>	T 1/9	Fundamentals of distributed systems	Ch. 1, pp. 1-23
	Th 1/11	Basic communication services	Ch. 2, pp. 25-43
<b>#2</b>	T 1/16	<b>NO CLASS – MONDAY CLASSES</b>	Ch. 3, pp. 45-52; Ch. 4, pp. 53-65
	Th 1/21	High assurance communication; client/server	
<b>#3</b>	T 1/23	Marshalling; associated services	Ch. 4, pp. 65-83
	Th 1/25	Client/server computing	Ch. 5, pp. 85-117
<b>#4</b>	T 1/30	<b>NO CLASS</b>	Ch. 6, pp. 119-131
	Th 2/1	CORBA	
<b>#5</b>	T 2/6	IDL, ORB, naming service	Ch. 6, pp. 131-140
	Th 2/8	World wide web	Ch. 8, pp. 157-169
<b>#6</b>	T 2/13	<b>PRESIDENTS' HOLIDAY</b>	Ch. 9, pp. 171-192
	Th 2/15	Web technologies	
<b>#7</b>	T 2/20	Web services	Ch. 10, pp. 193-208
	Th 2/22	Web services and failures; .NET and J2EE	Ch. 10, pp. 208-213; Ch. 12, pp. 227-234
<b>#8</b>	T 2/27	Failures in computer systems	Ch. 13, pp. 235-246
	Th 3/1	<b>MIDTERM EXAM</b>	Chs. 1-6, 8-10, 12-13

## COURSE OUTLINE

### Weeks 9-15

Text: Birman, [\*Reliable Distributed Systems: Technologies, Web Services, and Applications\*](#)

Week/Date	Topic	Chapter/Pages	
#9	T 3/6	System behavior	Ch. 14, pp. 247-261
	Th 3/8	Failure models	Ch. 14, pp. 436-275
3/12 – 3/16	<b>SPRING VACATION</b>		
#10	T 3/20	Dynamic group membership	Ch. 15, pp. 277-290
	Th 3/22	FLP impossibility result	Ch. 15, pp. 290-302
#11	T 3/27	Byzantine fault detectors	Supplemental material
	Th 3/29	Group communication	Ch. 16, pp. 303-318
#12	T 4/3	Ordered multicast	Ch. 16, pp. 318-333
	Th 4/5	Distributed deadlocks	Ch. 16, pp. 333-338; Ch. 17, pp. 341-350
#13	T 4/10	Virtual synchrony	Ch. 18, pp. 351-362
	Th 4/12	Virtually synchronous algorithms	Ch. 18, pp. 362-374
#14	T 4/17	Consistency in distributed systems	Ch. 19, pp. 375-390
	Th 4/19	SecureRing	Supplemental material
#15	T 4/24	Immune	Supplemental material
	Th 4/26	Starfish	Supplemental material

### FINAL EXAM:

Thursday, May 3<sup>rd</sup>, 12:00-2:00 pm