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Fall 2013

## CEG 7370-01: Distributed Computing

Yong Pei

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# CEG 7370 Distributed Computing

## Syllabus

Fall Semester, 2013

<b>Time/Place:</b>	Lecture: 4:40 – 6:00 PM, M/W, Millett 286 For the web section, the lecture videos will be made available as early as the following day.
<b>Instructor:</b>	Dr. Yong Pei, 489 Joshi Research Center Tel. 937-775-5111, Email: yong.pei@wright.edu Office Hours: 12:45-2:15 pm, M/W.
<b>Prerequisite:</b>	Undergraduate level <u>CEG 4350</u> or equivalent. Expected background: operating system, process and thread, C/C++ and JAVA programming experience in UNIX or Linux.
<b>Catalog Data:</b>	Semaphores: weak and strong, split-binary, distributed. Distributed Algorithms. Communicating sequential processes. Distributed Tuple Space. Clients and servers, RPC, RMI, Hadoop. 3 hours lecture.
<b>Text Books:</b>	<i>Recommended:</i> <ol style="list-style-type: none"><li>1. Coulouris, G., Dollimore, J., and Kindberg, T. , Distributed Systems: Concepts and Design, 4th Edition, Addison Wesley, 2005</li><li>2. <u>Queueing Systems, Volume I: Theory</u>, L.Kleinrock, John Wiley &amp; Sons, 1975.</li></ol> <i>References:</i> <ul style="list-style-type: none"><li>- A. Silberschatz, P. Galvin, and G. Gagne, <i>Operating System Concepts</i>, John Wiley &amp; Sons.</li><li>- Tanenbaum, A. and Maarten van Steen, Distributed Systems Principles and Paradigms, 2002: Prentice-Hall, ISBN 0-13-088893-1.</li><li>- A. Tanenbaum, <i>Distributed Operating Systems</i>, Prentice Hall.</li></ul>
<b>Website:</b>	CEG 7370 in Pilot.
<b>Grading:</b>	Project assignments – 40 % Midterm Exam – 30% Final – 30%

## **Lectures:**

The following tentative schedule defines in greater details what material is covered in the course and when it is covered.

<b>Week</b>	<b>Topic/Tests etc.</b>
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### **Fundamentals of distributed computing and systems**

1-2	Models of distributed Systems, IPC, Networking, Remote procedure call, Remote Invocation
2-3	OS Supports and Security. DFS, NFS, AFS
3-4	Name, directory & discovery services, Peer-to-peer systems, Fault tolerant services, Transactions with replicated data

### **Case studies of distributed computing system**

5-6	GFS, MapReduce, Hadoop, Hadoop Files System
6-7	Multimedia streaming and VOD
7-8	Pastry – a Structured DHT Overlay Network

(Mid-term exam Wednesday of the 8<sup>th</sup> week)

8-9	Distributed sensor systems
9-10	Mobile and Ubiquitous computing

### **Distributed System Modeling and Performance Evaluations:**

11-12	Basic concepts in probability and stochastic process; exponential distribution, poisson process, Little's theorem, Markov chain, balance equations, birth-death process. Selected topics from Chapters 1,2,3 of Kleinrock and handouts.
13-14	Queueing Theory Fundamentals; M/M/1, M/M/*. Selected topics from Chapters 3,4,5 of Kleinrock and handouts.

(Final Exam on Monday of Week 15)

15-16	Open-Design Project Presentations
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