COURSE NO: CSC5250/ECE5650
TITLE: NETWORKED, CONCURRENT AND DISTRIBUTED PROGRAMMING

INSTRUCTOR: WEISONG SHI, ASSOCIATE PROFESSOR OF COMPUTER SCIENCE
5057 WOODWARD AVE, SUITE 14102.2
HTTP://WWW.CS.WAYNE.EDU/~WEISONG
OFFICE HOURS: 4:30PM-5:30PM, MONDAYS AND WEDNESDAYS
PHONE: 313-577-3186
COURSE MEETING TIME: MONDAYS AND WEDNESDAYS, 3:00-4:20PM
COURSE MEETING LOCATION: 314 STATE HALL

COURSE DESCRIPTION
This course is a junior graduate-level course on networking, distributed and concurrent programming, focusing on the fundamental concepts and skills of developing distributed applications. Topics that will be covered include: Internet protocols, inter-process communication, TCP/IP sockets programming, remote procedure call and remote method invocation, multithreading, concurrency and synchronization. Time permitting, we shall also discuss additional topics such as simple object access protocol (SOAP), web services, and service-oriented architecture.

PREREQUISITES
CSC4420: Operating Systems or CSC4992 (Introduction to Comp. Net.) or consent of instructor.

CO-REQUISITES
Although not an official prerequisite, you will find the programming assignments easier to handle if you have some familiarity with some programming languages, such as Java, C/C++, and UNIX program development tools (text editors, make, etc.). I will expect you to pick up requisite knowledge of the above tools in the first few weeks of class on your own. See the course resources page for several online tutorials on these topics.

TEXTBOOK AND OTHER REQUIRED MATERIAL
UNIX Network Programming, Volume 1, 3rd Edition
Author: W. Richard Stevens
Publisher: Prentice Hall PTR

Since this is a programming-oriented course which covers broaden topics, the lectures will not closely follow the organization of those books. Please follow the course slides and handouts after each class.

COURSE OBJECTIVES
At the end of this course, students will be able to:
1. define the services of the application, transport, network, link and physical layers of the Internet protocol stack.
2. architect and implement network applications using TCP/UDP socket programming in Java.
3. explain how end-to-end applications communicate over the internet.
4. define the specification and limitation of different network protocols and hardware components that make up the internet.
5. calculate communication delays and detail several error checking methods in packet-switched networks.

**TOPICS COVERED**

Topics that will be covered include: Internet protocols, inter-process communication, TCP/IP sockets programming, remote procedure call and remote method invocation, multithreading, concurrency and synchronization. Time permitting, we shall also discuss additional topics such as simple object access protocol (SOAP), web services, and service-oriented architecture.

**CONTRIBUTION TO PROFESSIONAL PROGRAM COMPONENTS**

This course contributes 4 credits to the Engineering component of the professional program.

**OUTCOME COVERAGE**

This course contributes to a student’s successful completion of the following program outcomes:
(a) an ability to apply knowledge of mathematics, science, and engineering
(b) an ability to design and conduct experiments, as well as to analyze and interpret data
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
(e) an ability to identify, formulate, and solve engineering problems
(f) an understanding of professional and ethical responsibility
(g) an ability to communicate effectively
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
(j) a knowledge of contemporary issues
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

**Workload**

- **Class**: You are expected to attend all of the lectures.
- **Readings**: You are responsible for completing suggested readings; this would help both in understanding the lecture material, and in finishing your assignment.
- **Labs**: There will be five (5) required homework assignments and one midterm project and one final project during the semester. You must work on yourself on the five homework assignments, but may work through midterm and final projects in groups of 2-3 students and present your results in “demo sessions” (Oral Exam). Although a fair bit of work, these labs will be fun and valuable.
- **There will be NO Written Exams**

**Grading**
Final grades will be computed based upon the following weights:

Homework assignments: 50% (10% each assignment)
Projects: 50% (20% for midterm project and 30% for final project)
Extra credit will be granted for particular clever or creative solutions in the two projects.

Grading scale in CSC5250:

- A: [90-105]
- A-: [85-90]
- B+: [80-85]
- B: [75-80]
- B-: [70-75]
- C+: [65-70]
- C: [60-65]
- F: [0-60]

**Policy on Collaboration**

You are required to do the homework assignments by yourself; collaborating with other students or copying their work will not be tolerated. Anyone found copying or using another person's work will be dealt with under WSU's policy on academic dishonesty. The consequences range from receiving a failing grade for the assignment to expulsion. For the two projects, I will expect every member of the group to be familiar with the approaches taken for each project, whether or not they were the ones who wrote the code.

However, we do strongly encourage students to discuss the materials covered in class. It is also acceptable to help or receive help from other students concerning features of NT or the UNIX operating system, or any other application that you use. There is a fine line between discussion and cheating. If you feel uncertain about whether you are crossing the line feel free to discuss these issues with the instructor before you do so.

**Policy on Cheating**

For the purposes of this class, cheating is defined as:

- Copying all or part of another student's homework
- Allowing another student to copy all or part of your homework
- Copying all or part of code found in a book, magazine, the internet, or other resource

To protect your files from being read by others on a Unix system, change their protection by executing the following command:

```
chmod go-rx *
```

You can make sure that all files you create are automatically protected by putting the following in your .cshrc or .profile file:

```
umask 077
```
The class policy on academic dishonesty is now available on-line (http://www.cs.wayne.edu/~weisong/courses/dishonesty-policy.html). This policy is the same in all classes I teach. In order to further clarify this policy for graduate courses, I will follow the same myths about cheating (http://www.cs.wayne.edu/~weisong/courses/cheating-myths.html) on programming assignments.

Enrollment Deadline Changes Effective Fall 2011

Change in Time Allowed to Add Classes

Effective Fall 2011, students must add classes no later than the end of the first week, including online classes. During the second week of the semester, starting with Wednesday, September 7, students must personally request departmental permission in order to register. If departmental permission is granted, students must register themselves for the class in Pipeline during the second week. Receiving departmental permission is NOT the same as registering for the class! Students may continue to drop classes (with full tuition cancellation) through the first two weeks of the term.

Earlier Withdrawal Deadline

Effective Fall 2011, the withdrawal deadline from this semester forward will change from the WSU designated “Study Day” at the end of the 14th week of classes to the end of the 10th week of classes. Beginning Fall 2011, students who wish to withdraw must initiate the request in Pipeline no later than Saturday, November 12, 2011. After the deadline, the Withdraw option will not be available in Pipeline. The Registrar’s Office does not grant exceptions to this deadline so please plan ahead and mark your calendar.