CS 402b/535b: Distributed and Parallel Systems

The University of Western Ontario
Distributed and Parallel Systems
Course Description – Spring 2006

Description

This course studies the fundamental aspects of building distributed systems and developing distributed applications. Emphasis is placed on client-server and peer-to-peer application design, implementation using sockets and developing reliable applications through the use of replication, group membership protocols, clock synchronisation and logical timestamps. Students will have the opportunity to develop peer-to-peer and reliable distributed applications.

Lecture Hours

This course meets three hours per week on Tuesday from 8:30 to 10:30 and Thursday from 9:30 to 10:30 in MC 320.

Prerequisites

CS305 – Operating Systems
CS350 – Computer Architecture (sometimes not enforced)
CS357 – Computer Communication Networks

Note: Students who have been admitted to this course without the normal prerequisites may not have been exposed to some of the background material expected for this course; it is the responsibility of these students to gain familiarity with this material on their own.

Antirequsite

SE 466

Instructor

Name – Dr. Hanan Lutfiyya
Office Location – Middlesex College MC418
Phone Number – 661-2111 Ext. 86888

E-Mail – hanan@csd.uwo.ca
Office Hours (Tentative) – Tuesday 10:45-11:45, Thursdays 10:45-12:45 or by appointment.

Textbooks and Lecture Notes

Required Textbook:

One book is required for this course and is available for purchase from the University Bookstore.

- Andrew S. Tanenbaum and Maarten van Steen, *Distributed Systems: Principles and Paradigms*, Prentice-Hall, ISBN 0-13-088893-1, 2002.

References:

- G. Colouris, J. Dollimore, and T. Kindberg, *Distributed Systems: Concepts and Design*, 3rd edition, Addison-Wesley, 2001.
- J. Kurose and K. Ross, *Computer Networking: A Top-Down Approach Featuring the Internet*, Addison-Wesley, 2001.
- R. Stevens, Unix Network Programming, Volume 1, Prentice-Hall.
- Links to web pages on various topics including socket programming, RPC, and threads.
- The man pages

Lecture Notes:

Lecture overheads will be available (hopefully) before each lecture through the CS402 web site.

Computing Facilities

Each student will be given an account on the Computer Science Department senior undergraduate computing facility, GAUL. In accepting the GAUL account, a student agrees to abide by the department's Rules of Ethical Conduct.

Email Contact

We will occasionally need to send email messages to the whole class, or to students individually. Email will be sent to your GAUL email address. You must make sure that you read your email on GAUL on a frequent and regular basis (at least every 3 days), or have it forwarded to an alternative email address if you prefer to read it there.

However, you should note that email at ITS (your UWO account) and other email providers such as *hotmail.com* or *yahoo.com* may have quotas or limits on the amount of space you can use. If you let your email accumulate there, your mailbox may fill up and

you may lose important email from your instructors. Losing email that you have forwarded to an alternative email address is not an excuse for not knowing about the information that was sent.

Email sent from hotmail or other non-UWO accounts, regarding important course details, will be ignored unless you cc your UWO account in the message.

Course Website

The course website is at http://www.csd.uwo.ca/courses/CS402b. Important announcements, assignments, and other course related information will be posted on this web site. You are responsible for checking the information. If you fail to do so and miss any information, this is your problem and no special accommodations will be given.

Student Evaluation

- There are three basic components that will be used to determine a student's mark in the course:
  - A final exam worth 40% of the overall mark
  - One quiz worth 15% of the overall mark
  - Programming assignments worth 45% of the overall mark
- The following rules are designed to ensure that students progressing in the honors programs and the fourth year general meet certain minimum standards:
  - To be eligible to pass the course, a student must receive at least 40% in the quiz/exam component and at least a 40% in the individual assignments.
  - To be eligible to receive an overall grade of 60% or higher in the course, a student must receive at least 50% in the quiz/exam component and at least 50% in the individual assignments.
- **Exams and Quiz** (Tentative)

  The final exam is scheduled by the Registrar. It is tentatively set for April 24 at 2:00 PM. There is a one hour in-class quiz on February 23.
  - Both the quiz and the final exam are closed-book. You are allowed one 8x11 sheet of paper with handwritten notes on it.
  - There will be no makeup quiz, except for students requesting a Special Quiz for religious reasons. These students must have notified the course instructor and filed documentation with their Dean's office at least two weeks prior to the Quiz.

- If you miss the Midterm Quiz for any other reason, and present valid documentation to the Dean's office, your Final Exam mark will be reweighted to include the weight of the Quiz. You must notify the course instructor within a week of the missed Quiz, and documentation must be received by your Dean's office within 2 weeks of the missed Quiz.
- Quiz marks will be posted within 2 weeks of the quiz at the latest.

- **Assignments**

  There are three programming assignments. The assignment schedule is found in table 1.

Assignment	Due Date	Groups	Expected Load	Weight
1	Feb 10	Yes	Medium	12%
2	Mar 10	Yes	Medium	15%
3	Apr 7	Yes	Medium	18%

Table 1: Programming Assignment Workload

  If we cannot keep to the assignment schedule, marks will be pro-rated as necessary, within the 45% allotment for programming assignments.

  Changes will not be made to these due dates without consulting the Computer Science Department.

Assignments

Assignments will be made available on the departmental computing system through the 402 home page (*http://www.csd.uwo.ca/courses/CS402b*). Students are responsible for checking their e-mail on a regular basis.

Assignment Submission

- All assignments are due by midnight of the due date in the locker assigned for this course. This includes an Assignment Submission Form (see web site) that is filled out and signed.
- All programming assignments will be submitted electronically using the submit command on GAUL. More details will be provided with assignment handouts.
- To be eligible for full marks, assignments must run on the departmental computing equipment. You may develop assignments on your home computer, but you must allow for the amount of time it will take to get the final product working on *GAUL*. Assignments that work on your own computer but not on *GAUL* will be eligible for part marks.

Late Assignments

- Late assignments may be handed in, but with a penalty of 2^n marks, where n is the number of days late. For example, if an assignment is turned in one day late, 2 marks are deducted, and so on. Saturday and Sunday together count as one day.
- Assignments more than 5 days late will not be accepted.
- Extensions will be granted only by the course instructor, not by a TA, and will be granted only on serious medical or compassionate grounds. To obtain an extension, you must take supporting documentation to the office of the Dean of your faculty, who will contact the instructor.
- In cases of undocumented minor illness, extensions will not be given, and you should use late coupons (described below).

Late Coupons

Each student will be given 3 "late coupons". Each coupon can be thought of as a potential one-day assignment extension. It is entirely up to you to decide when to use your coupons; more than one coupon may be used per assignment. You will indicate the number of coupons to be used on the Assignment Submission Form. The number of coupons used will be recorded.

The intent of late coupons is to give you some "free" days in case of minor illness, work overload, etc.; no extensions will be given in such cases.

The rules for late coupons are the following:

- Coupons are not transferable to another student.
- Once a coupon has been used, you cannot "take it back" to use for another assignment instead.
- Coupons cannot be redeemed retroactively. (If an assignment has been marked, a coupon cannot later be used to reduce the late penalty.)
- Unused coupons are not redeemable for extra marks.
- Using a late coupon does not change the final date on which an assignment will be accepted. Whether or not coupons are used, the assignment must be handed in within 5 days of the original due date.
- The coupons are "virtual", and you must indicate the number of late coupons you wish to use for a particular assignment on its Assignment Submission Form. Handwritten notes or email messages will not be accepted.
- No more than three coupons may be used for an assignment.

Assignment Backups

To guard against the possibility of lost assignments and errors in recording marks, students are advised to retain all assignments that are handed back to them, as well as disk copies of all materials they hand in, at least until final marks for the course are posted. (Otherwise, we have no evidence that a mark should be revised.)

Assignment Marking

Here is some general information related to assignment marking.

- Assignments will be marked by the TA's. You are responsible for picking up your assignment from the I/O counter.
- Every effort will be made to have assignments marked and handed back within 3 weeks of the handin date, preferably sooner.
- A request for an adjustment in an assignment mark must be made within 2 weeks after the assignment is returned in class. All assignment marks are considered to be final after that date, even if you did not pick up the assignment. All requests for mark adjustment are to be written and submitted to the instructor.

Programming Assignment Marking Schemes

- A programming assignment is considered to be "working" if it is shown to satisfy all the requirements specified in the assignment description, including correct results.
- Note that a programming assignment is an exercise meant to give you practice in certain concepts. Therefore, a program that produces the correct output is not necessarily a "working" program; it must also satisfy the specifications given in the assignment description!
- Other criteria in terms of which an assignment will be evaluated include coding style, comments, and efficiency.

Special Note for CS535 Students

In addition to the above, CS535 students are required to write a review of three papers from the recent literature. Suggested papers will be put up on the CS402 web site. This is individual work. Each review is 5 points. The total number of points in the course is 125 points. This mark will be converted to a final mark out of 100.

Ethical Conduct

All assignments are individual assignments. You may discuss approaches to problems among yourselves; however, the actual details of the work (assignment coding, answers to concept questions, etc.) must be an individual effort. Assignments that are judged to be the result of academic dishonesty will, for the student's first offence, be given a mark of zero with an additional penalty equal to the weight of the assignment also being applied. You are responsible for reading and respecting the Computer Science Department's policy on Scholastic Offences and Rules of Ethical Conduct.

Students must write their essays and assignments in their own words. Whenever students take an idea or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes

or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar).

The University of Western Ontario uses software for plagiarism checking. Students will be required to submit their programs in electronic form for plagiarism checking.

Addendum to all Computer Science Course Outlines

The UWO Senate Academic Handbook has specified that the following points should be added to all course outlines:

1. **Plagiarism**: Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar).

2. **Plagiarism Checking**: The University of Western Ontario uses software for plagiarism checking. Students may be required to submit their written work and programs in electronic form for plagiarism checking.

3. **Prerequisites for a course**: Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you will be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

4. If computer-marked multiple-choice tests and/or exams are given: Use may be made of software to check for unusual coincidences in answer patterns that may indicate cheating.