COMP 4104

Principles and Practice of Distributed Programming

Fall 2013

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Lectures:

COMP 4104 (HP 4125)
Tue. and Thu. 1:05 pm-2:25 pm

Instructor:

Tony White
arpwhite at(sc.scs.carleton.ca
HP 5354, 520-2600 x2208

Office Hours: Tue. and Thu. 12:00 pm-1:00 pm or by appointment

Teaching Assistants:

The TA(s) for this course will be in HP 5325 (The Complex Adaptive Systems Lab) during stated office hours.

<table>
<thead>
<tr>
<th>Name</th>
<th>Office Hours</th>
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<td>David McKenney</td>
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Course Description:

Advanced course on distributed programming in Java. Introduces students to standard design patterns for implementing components that solve common distributed programming challenges. Topics covered include: threads, message passing, coordination, distributed object technology, software frameworks, web-based services, and collaborative applications.

Topics Covered:

1. Definition and examples of distributed systems
2. Management of concurrency in distributed systems
3. Software and architectural patterns for construction of distributed systems
4. Communication paradigms for distributed systems: message passing, remote procedure calls, message queues, tuple spaces

Prerequisites:

(COMP 2005 or COMP 2405) and COMP 3004.
Course Objectives:

The principal objective of this course is to provide students with knowledge that enables them to analyze, design and construct robust, distributed applications using accepted software and architectural patterns.

Textbooks:

Recommended, but not essential:

- Brian Goetz, *Java Concurrency in Practice* Addison Wesley, 2006 *(Good for reference)*

Useful for deeper knowledge of patterns and middleware design:

- Wolfgang Emmerich, Engineering Distributed Objects, Wiley
- Gregor Hohpe, Bobby Woolf, *Enterprise Integration Patterns*
- Thomas Erl, *SOA Design Patterns*

Good site for free computer books. Includes useful material on CORBA, SOA, Web Services, ...

Links to Web-based materials will be provided as the course progresses.

In-class Problems:

Problems set in class have to be DEMONSTRATED to a TA or the professor by end of class 1 week later. The purpose of the demonstration is to allow Prof. White to ask questions regarding understanding of the material and to provide constructive criticism on the solutions. Prof. White will generally be available 10-15 minutes before each class in 4125 HP to mark in-class problems. He will also be available after class for marking and general consultation.

Assignments:

There will be 4 assignments, submitted in pairs. All assignments carry equal marks. *cuLearn* will be used for assignment submission and grading.

Laboratory:

Information on the computer laboratories for this course is here. The lab machines are equipped with computers running a Windows OS connected via a network to printers and a file server. Students are permitted to use their own facilities, but must acquire their own software to run on their own machines.

Software:

Assignments will be written in Java. It is strongly recommended that you use *Eclipse* for development. An IDL compiler is included with the J2SE SDK, as is a basic ORB. The J2SE SDK is installed on the SCS zeta machines.
If you are having software problems with the Linux machines, send e-mail to support@scs.carleton.ca.

Assignment Submission:

You should take the time to ensure that your assignments are well documented and easy to understand. Assignments that don't meet these standards will be given fewer marks. Guidelines have been written that define documentation and testing standards. NOTE: NO LATE ASSIGNMENTS WILL BE ACCEPTED. cuLearn will be used for assignment submission.

Marks will be posted on-line as soon as assignments have been graded. It is your responsibility to notify the instructor of any inconsistencies at once. Any complaints regarding assignment marks should be brought to the attention of the TA who marked them. This should be done no later than two weeks after the assignment has been first marked. No assignment remarking will be done after this time.

You should take the time to ensure that assignments are neat, legible and easy to understand. Any instructions required by the teaching assistants (for example any assumptions you made about the assignments) should be clearly indicated in a README.TXT file submitted with your assignment. Remember, it is YOUR responsibility to demonstrate that you have understood and completed the assignment. A significant portion of your grade for assignments will be given for the readability of them and for your demonstration that you have completed the assigned tasks.

There will be 4 assignments in this course which will be available on the course web page. All assignments are counted towards the final grade.

Copying of assignments is strictly disallowed. On the first occasion, all students involved will be given a mark of 0. On subsequent occasions, students will be asked to withdraw from the course.

Evaluation:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Assignments (4)</td>
<td>25%</td>
</tr>
<tr>
<td>In-class problems</td>
<td>20%</td>
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<tr>
<td>Mid-term</td>
<td>20%</td>
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<tr>
<td>Final</td>
<td>35%</td>
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Assignments will be submitted in teams of 2 and carry equal marks.

Double Pass Rule applies; i.e., you must pass the course work (assignments+in-class problems+midterm) to take the final.

Course Web Page:

As well as being announced in class, all important information, such as course news, assignments, TA hours, instructor office hours, will be available on the course web page at http://www.scs.carleton.ca/~courses/4104. It is the student's responsibility to check this web page for new information regularly.
Collaboration Policy

Collaborating outside of your team on assignments is strictly disallowed. Your team must complete the work. If you need help, please see a TA or your instructor. Posting assignment solutions on discussion boards before the due date and time is also prohibited.

SCS Computer Accounts

Any student taking an SCS course qualifies to have an SCS account. SCS accounts can be created at the following URL: http://www.scs.carleton.ca/newacct. SCS students can access one of the designated labs for your course. The labs are operational 7 days a week 24 hours per day, please be advised that the building will be closed overnight, Mon. - Fri. 23:00 - 8:00 and on weekends from 17:00 - 8:00. Technical support is available in room HP5161 Monday to Friday from 9:00 until 17:00. All SCS account related information is accessible at the following URL: http://www.scs.carleton.ca/nethelp.

Undergraduate Academic Advisor

The Undergraduate Advisor for the School of Computer Science is available in Room 5302C HP, by telephone at 520-2600, ext. 4364 or by email at undergraduate_advisor@scs.carleton.ca. The undergraduate advisor can assist with information about prerequisites and preclusions, course substitutions/equivalencies, understanding your academic audit and the remaining requirements for graduation. The undergraduate advisor will also refer students to appropriate resources such as the Science Student Success Centre, Learning Support Services and the Writing Tutorial Services.

University Policies

Student Academic Integrity Policy

Every student should be familiar with the Carleton University student academic integrity policy. A student found in violation of academic integrity standards may be awarded penalties which range from a reprimand to receiving a grade of F in the course or even being expelled from the program or University. Some examples of offences are: plagiarism and unauthorized co-operation or collaboration. Information on this policy may be found in the Undergraduate Calendar.

Plagiarism

As defined by Senate, "plagiarism is presenting, whether intentional or not, the ideas, expression of ideas or work of others as one's own". Such reported offences will be reviewed by the office of the Dean of Science.

Unauthorized Co-operation or Collaboration

Senate policy states that "to ensure fairness and equity in assessment of term work, students shall not co-operate or collaborate in the completion of an academic assignment, in whole or in part, when the instructor has indicated that the assignment is to be completed on an individual basis". Please refer to the course outline statement or the instructor concerning this issue.

Academic Accommodations for Students with Disabilities
The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable) at http://www2.carleton.ca/pmc/new-and-current-students/dates-and-deadlines

Religious Obligation

Write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: http://www2.carleton.ca/equity/

Pregnancy Obligation

Write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: http://www2.carleton.ca/equity/

Medical Certificate

The following is a link to the official medical certificate accepted by Carleton University for the deferral of final examinations or assignments in undergraduate courses. To access the form, please go to http://www.carleton.ca/registrar/forms