Carleton University
School of Computer Science
COMP 4004A: Software Quality Engineering
Fall 2017
August 13th, 2017 (to be finalized later)

Class Schedule
Mon-Wed 10:05-11:25 TBA
Office hour Mon-Wed 11:45-12:30 or by email

Instructor Info
Jean-Pierre Corriveau
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TA: TBA

Detailed Course Description
It is widely acknowledged that software quality is of the utmost importance. Yet, despite recent advancements in program verification, automatic debugging, assertion deduction and model-based testing (MBT), Ralph Johnson (of Gang of Four design patterns fame) and many others still view software verification as a "catastrophic computer science failure". In this course we first and foremost explore the issue of software testing, that is, the execution of software in order to find errors. A first pervasive concern will be test automation, which is necessary if testing is to be objective, systematic, and scalable. A second pervasive concern will be the testing of scenarios (as captured in use cases, user stories, use case maps, and/or message sequence charts).

In the first part of the course, we will start with topics relevant to a more code-oriented (industry-relevant) approach to testing, focusing in particular on test driven development (TDD) and the strengths and limitations of popular testing tools such as JUnit and Cucumber. Then, in the second part of the course, we will move to more state-of-the-art model-based approaches to software testing. In particular, we will focus on scenario monitoring at run-time.

Assignments will address both parts of the course. Time permitting we will discuss other topics in OO Software Quality Engineering.

Prerequisites
The student is assumed to have a strong background in object-oriented programming, as provided by COMP 1406, COMP 2402, and COMP 2404. Programming aspects of the assignments are in JAVA. Also, students are assumed to be familiar with Java/Eclipse, use cases and Go4 design patterns.

Software
Students will be using Java/Eclipse, JUnit, Cucumber, and possibly other testing tools. Students are expected to learn by themselves all tools used in this course.
Assignments must be submitted through cuLearn AND must work in the senior SCS lab. There is NO textbook for this course. Some of the material used in class will be posted on the course website. Slides from instructor are generally posted at 2 and 4 per pages. There are several tutorials available online for the tools we use, in particular for JUnit (http://www.vogella.com/tutorials/JUnit/article.html) and Cucumber.

All student and professor materials created for this course (including presentations and posted material, labs, case studies, assignments and exams) remain the exclusive intellectual property of the author(s). They are intended for personal use and may not be reproduced or redistributed without prior written consent of the author(s).

cuLearn will be used for announcements and assignment submissions.

Suggested Optional Readings
1) Robert Binder (good introduction to OOT) 
   Object-oriented Testing, Addison-Wesley 2000

2) K. Naik and P. Tripathy (pricey but excellent reference for s/w testing) 

Evaluation
Students will be evaluated in this course according to the following components:

1) Assignments 70% (3 or 4 non-equally-valued)
2) Open-book final exam 30% (3 hours - formally scheduled)

NOTES:
1) There will be NO supplemental or grade raising exam in this course.
2) No mark (or extra work) can be substituted for another!
3) You MUST pass the assignments AND the final exam in order to pass the course. The exam addresses material covered during lectures; attendance is required to capture how much of the posted material is covered and what is added in class to it.
4) Assignments are to be done individually. Collaboration between students is NOT permitted: all alleged plagiarism will be reported to the faculty.

Assignments: Information and Late Policies
Late projects will not be accepted and will automatically receive a mark of 0.
**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 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.

**Science Student Success Centre (SSSC)**
The Science Student Success Centre is a central advising unit for students in Science courses. We help students achieve their goals by providing access to resources, workshops and activities that enhance their academic and study skills, and help them make key connections with their peers. Mentors can help you customize an individual study plan which includes weekly and semester work or study schedules, and also help when you need information on developing a new study strategy, obtaining summer job opportunities, or clarifying ideas and concepts to better understand and cope with new course content. Science mentors can help you learn how to learn what you need to learn for your classes. Drop by the Science Student Success Centre at 3431 Herzberg Laboratories or visit [http://sssc.carleton.ca/](http://sssc.carleton.ca/)

**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. The policy is at: [https://carleton.ca/senate/wp-content/uploads/Academic-Integrity-Policy1.pdf](https://carleton.ca/senate/wp-content/uploads/Academic-Integrity-Policy1.pdf)

**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.

**Unauthorized co-operation or collaboration**
As mentioned above, collaboration between students submitting distinct assignments is NOT permitted in this course.

**Equity Statements**
You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

**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/

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/

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). Requests made within two weeks will be reviewed on a case-by-case basis. After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (http://www.carleton.ca/pmc) for the deadline to request accommodations for the formally-scheduled exam (if applicable).

You can visit the Equity Services website to view the policies and to obtain more detailed information on academic accommodation at 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://www1.carleton.ca/registrar/forms/