

Instructor: Dr. A. Hamilton-Wright
 Office hours: Mondays 13:00-14:30 or by appointment; J.D. MacLachlan, room 227
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This course serves as an introduction to systematic methods of testing and verification, covering a range of static and dynamic techniques and their use within the software development process. Concepts such as defining necessary reliability, developing operational profiles, techniques to improve and predict software reliability, preparing and executing tests, black box testing, white box testing, unit testing, system testing, and integration testing will be explained.

Student Learning Outcomes:

Students successfully completing this course will be able to:

- identify, describe, analyze and select coverage based testing strategies;
- construct models for finite state analysis and data flow;
- design, construct, analyze and implement functional, combinatorial, structural and data flow testing strategies;
- identify, select and critique GUI testing strategies;
- adapt software development processes to incorporate testing, and critically analyze the results; and
- identify strategies for security and performance testing, and quantitatively analyze the implementation of best practices.

Textbook

Jorgensen, Paul C. (2014): *Software Testing: A Craftsman's Approach* Fourth edition. CRC Press/Taylor & Francis. ISBN 978-1-4665-6068-0

Marking Scheme

Assignments:			30 %
Worked problems:			
Problem set 1	Sep 25	4 %	
Problem set 2	Oct 30	4 %	
Problem set 3	Nov 13	4 %	
Computational:			
Test suite 1	Oct 11	9 %	
Test suite 2	Nov 29	9 %	
Labs:			15 %
Lab exercises	see below	5 @ 3 %	
Examinations:			55 %
Midterm	Oct 25	25 %	
Final	see Webadvisor	30 %	
Total:			100 %

A student must receive 50% or greater using the weighted sum indicated in the above table in order to pass the course.

Labs

A graded lab exercise will be due every two weeks, on the following dates: Sep 20, Oct 4, Oct 18, Nov 1, Nov 15 and Nov 29. Labs will be graded on a “best five out of six” basis (the lowest lab grade will be dropped).

Deadlines and assignment submission

All assignments will be submitted electronically through Courselink.

Deadlines shown in the Marking Scheme indicate the last point in time at which assignments are accepted without penalty. All assignments are due at the beginning of class on the day that the assignment due date occurs. Late assignments are accepted for 24 hours after this time, however any late assignment will incur a 15% penalty. Assignments submitted more than 24 hours late are not accepted, will not be graded, and will be assigned a mark of zero.

Course Topic Timetable:

The following provides a rough ordering of the topics in the course:

- Software Reliability Fundamentals of Testing and Analysis
- Finite and Data Flow Models
- Test Case Selection
- Functional, Combinatorial, Structural, Data Flow Testing
- Testing Object Oriented Software
- Testing GUIs
- Testing within the Software Development Process
- Security and Performance Testing
- Testing Stochastic Systems

Ethical Behaviour

Ethical conduct in the classroom and in academic work are critical to a healthy learning environment. Ethical conduct in all areas of University work is taken very seriously at the University of Guelph.

Code of Conduct

Our learning environment must be a friendly, safe and welcoming environment for all, regardless of ethnicity, gender, sexual orientation, ability, socioeconomic status, and religion (or lack thereof). As we wish to facilitate and encourage the fullest participation from everyone, this code of conduct outlines the expectations for all participants (including the instructor and other staff).^a This policy is aligned with the larger University policy on Non-Academic Misconduct: <https://www.uoguelph.ca/secretariat/office-services/student-judicial-services/non-academic-misconduct/policy-non-academic-misconduct>

^aThis code of conduct is based upon the citizen code of conduct available via <http://citizencodeofconduct.org/>, and is distributed under a Creative Commons Attribution-ShareAlike license (<http://creativecommons.org/licenses/by-sa/3.0/>)

Expected Behaviour

- Participate in an authentic and active way. In doing so, you contribute to the health and value of this community.
- Exercise consideration and respect in your speech and actions.
- Attempt collaboration before conflict.
- Refrain from demeaning, discriminatory, or harassing behaviour and speech.
- Be mindful of your surroundings and of your fellow participants. Alert community leaders (for example, your instructor) if you notice a dangerous situation, someone in distress, or violations of this Code of Conduct, even if they seem inconsequential.

Citizenship and Participation

Communities mirror the societies in which they exist and positive action is essential to counteract the many forms of inequality and abuses of power that exist in society.

If you see someone who is making an extra effort to ensure our community is welcoming, friendly, and encourages all participants to contribute to the fullest extent, we want to know.

Unacceptable Behaviour

Unacceptable behaviours include: intimidating, harassing, abusive, discriminatory, derogatory or demeaning speech or actions by any participant in our community, either in person, online, at any related events, or in one-on-one communications carried out in the context of community business.

Harassment includes: harmful or prejudicial verbal or written comments related to race, religion, disability, gender, sexual orientation; inappropriate use of nudity and/or sexual images in public spaces (including computer labs and presentation slides); deliberate intimidation, stalking or following; harassing photography or recording; sustained disruption of talks or other events; inappropriate physical contact, and unwelcome sexual attention.

Consequences of Unacceptable Behaviour

Unacceptable behaviour from any community member, including the course instructor and those members with decision-making authority, will not be tolerated.

Anyone asked to stop unacceptable behaviour is expected to comply immediately.

If a community member engages in unacceptable behaviour, action *will* be taken to ensure that such behaviour ends, beginning with action on the part of the course instructor, and escalating if necessary.

Additional information on University policy regarding harassment, conduct and human rights is available at the following web page:

<https://www.uoguelph.ca/diversity-human-rights/>

If You Witness or Are Subject to Unacceptable Behaviour

If you are subject to or witness unacceptable behaviour, or have any other concerns, please notify the course instructor as soon as possible.

If you feel that the course instructor cannot or will not provide remedy for the situation, please contact any of these alternate resources:

- Associate Director (Undergraduate) <ugraddir@socs.uoguelph.ca>

- Director of the School <director@socs.uoguelph.ca>
- Associate Dean (Academic) <cpesada@uoguelph.ca>
- Office of Diversity and Human Rights <dhinfo@uoguelph.ca> or extension 53000
- Campus Community Police at extension 52245

Academic Integrity

Just as ethical and inclusive behaviour is required in inter-personal communications for course based activity, the university community requires ethical behaviour in the performance of all academic activity.

All forms of academic misconduct are dealt with quite seriously at University of Guelph. Plagiarism and other forms of academic fraud are offensive activities pursued vigorously by the University.

It is your responsibility to read and be familiar with the academic regulations of the University as presented in the Calendar. Be sure that you have a complete understanding of the concepts as described in the “Academic Misconduct” subsection within Section VIII “Undergraduate Degree Regulations and Procedures” within the Calendar:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

In particular, it is your responsibility to accurately and clearly indicate the work of *any and all contributing people*, including yourself, in all presented and submitted materials. By handing in any work for this course, unless you have specifically identified any other authorship, *you are claiming that the sole authorship is your own*. Including work from any other person without directly indicating the source of such work constitutes academic fraud of some type.

If you have any questions about what academic fraud such as plagiarism entails, or about any other forms of academic misconduct, please ask your course instructor.

Mental Health

University of Guelph course instructors and student services cooperate to assist in helping students manage course and life stressors. Additionally, help is available through counselling services. Please see the Mental Health Resources page for details:

<https://wellness.uoguelph.ca/counselling/mental-health-resources>

Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability, or for a short-term disability should contact Student Accessibility Services (SAS) as soon as possible.

SAS may be contacted at <csd@uoguelph.ca> or extension 56208. For more information, see the website: <http://www.uoguelph.ca/csd/>