Carleton University School of Computer Science
COMP 4004 A and B – Software Quality Assurance

1. Course Information

Instructor: Sean Benjamin   SeanBenjamin@cunet.carleton.ca HP 5374
Lectures A: Tue/Thu 16:05 - 17:25
Lectures B: Wed/Fri, 08h35 - 09:55
Office Hours: posted on BrightSpace   **Classrooms:**   posted on BrightSpace
Teaching Team: posted on BrightSpace   **Website**:   posted on BrightSpace
Date Range: Sept. 03, 2025 - Dec. 20, 2025   **Section Type**:   In-Person

Land acknowledgement: Carleton University acknowledges the location of its campus on the traditional, unceded territories of the Algonquin Nation.

2. Course Description

Introduction to the theory and practice of Software Quality Assurance. Topics include: equivalence partitioning, test-driven testing, unit testing patterns, refactoring, software metrics, requirements engineering, scenario modelling and acceptance testing, model-based testing, state machine testing, software testing theory and tools.

Prerequisite Courses: COMP 3004
Precludes additional credit for SYSC 4101.

3. Requisite Knowledge

A student registering in COMP 4004 is assumed to have a strong background in object-oriented design, programming and web development. More specifically, a student should have taken COMP 2401, 2406 and 3004, or their equivalent.

4. Topics Covered and Learning Objectives

4.1 Topics Covered:
The course will cover the following topics (some material may be omitted due to time constraints): Test Driven Development (TDD), Code-Oriented Testing, Refactoring, Model-Based Testing, Equivalence Partitioning, and Software Metrics.

4.2 Learning Objectives:
Theory: (verified through quiz and final exam)
- Understand the basics of software testing (in particular, equivalence partitioning) and software metrics.
- Understand the principles and limitations of test driven development (TDD) in the context of Agile Development, as well as issues of refactoring.
- Understand behaviour driven development (BDD) for acceptance testing.
- Understand the principles and limitations of model based testing (MBT).
- Understand some seminal papers and advanced issues of software testing.

Practice: (verified through three assignments)
Gain experience in learning and using testing tools BY YOURSELF:
- Gain experience with using JUnit for TDD.
- Gain experience with BDD and scenario based testing using Cucumber.
- Gain experience with testing a web application using Cypress and Jest.

5. Textbook(s) and Learning Material(s)

Students are **not required** to purchase textbooks or other learning materials for this course.

6. Laptop Requirements (School of Computer Science)

A **laptop** is required for every student enrolled in a 1000-level (i.e., first-year) course offered by the School of Computer Science after the 2020/2021 school year. For more information, please visit https://carleton.ca/scs/scs-laptop-requirement/ and then review the requirements at https://carleton.ca/scs/scslaptop-requirement/laptop-specs/.

7. Course Evaluation

Final grades will be determined using the scheme below, and **no extra credit assignments will be provided under any circumstances**. **Refer to the tentative calendar in Brightspace (Course Information module) for assignment and quiz due dates.**

Component	Weight	Details	Due Date (Eastern Standard Time)
Assignments	50%	Assignment 1: 20% Assignment 2: 14% Assignment 3: 16%	**Assignment 1: Oct. 17, 2025.** **Assignment 2: Nov. 14, 2025.** **Assignment 3: Dec. 5, 2025.**

			Assignments 1, 2, and 3 are due on Fridays by 23h59.
Quiz	15%	Held during class time.	**Section A: Thursday, Oct 30** **Section B: Friday, Oct 31**
Final Exam	35%	Formal Exam	To Be Announced By the University

8. Late and Missed Work Policies

8.1. Late penalty: Late assignments will incur a deduction of 5% of denominator marks for every hour late, or part of an hour late, up to a maximum of 10 hours past the submission deadline. Once this 10-hour time window has elapsed, the Brightspace submission link will expire, and no submissions, substitutions, or corrections will be accepted, for any reason.

8.2.1. Students may request a 48-hour deadline extension for a maximum of one (1) assignment during the entire term. The late penalty 10-hour time window will not be available for extensions.
8.2.2. Extension requests must be submitted two days before the original due date for the assignment, using the online form provided in Brightspace. Emailed requests will not be accepted.
8.2.3. No additional extensions will be granted, for any reason, including in cases of short-term absence or incapacitation, as stated in paragraph 8.3.
8.2.4. Extension requests received after the original due date will automatically be denied.
8.2.5. Once granted, an extension cannot be cancelled or deferred, even if a student does not use the granted extension.

8.3. Short-term absence: Short-term student absence or incapacitation will be accommodated through the existing flexibility provisions stated in this course outline in paragraphs 8.1 and 8.2.

8.4. Long-term absence: Students who experience absence or incapacitation for longer than an accumulated total of five (5) days during the entire term cannot be accommodated, as they will be unable to achieve the learning outcomes of the course.

9. Grade Appeals and Grade Confirmation Policy

It is your responsibility to ensure that your quiz and assignment marks posted to Brightspace are correct, and you must do so within **one week** of the date the marks were

released. Appealing your grading must be communicated within a week after the release of the grade:

1. First, contact the teaching assistant who graded your assignment and/or quiz.
2. If you still have a grading dispute, please contact the instructor with the communication history between the student and the TA. Note that if the instructor needs to regrade your work, the grade may increase or decrease.

After that one week, no further consideration will be offered, and any student requests to correct or revise marks will not be accepted.

10. AI Usage

Two of the assignments in this course were designed to be completed by an individual working alone. The third assignment will use an AI system (e.g., ChatGPT, Google Gemini, Microsoft Copilot). An exception to the above rule is made for automated grammar and punctuation-checking tools (such as Grammarly).

11. Important Considerations

11.1 As the course is conducted in person, no recordings will be posted to Brightspace. **The grading scheme will remain unchanged under any circumstances, which means I cannot shift the weights of quizzes or assignments. No make-up assignments or quizzes will be provided.** Students are invited to **discuss any concerns with the instructor at the earliest opportunity.**

11.2 You are expected to attend all lectures. You are responsible for attending a quiz if it has been rescheduled to another lecture date due to inclement weather.

11.3 You are also expected to do the necessary preparatory work before you begin programming. **In addition to attending lectures, students can expect to spend at least eight (8) hours per week on this course.**

11.4 Students are responsible for all course materials. All materials created for this course (including, but not limited to, lecture notes, in-class examples, exercises, assignments, examinations, and posted solutions) remain the intellectual property of the instructor. These materials are intended for the personal and non-transferable use of students registered in the current course offering. Reposting, reproducing, or redistributing any course materials, in part or in whole, without the written consent of the instructor is strictly prohibited.

11.5 Students are asked to pose all questions related to course content using the official BrightSpace forums; students must avoid emailing the instructor directly unless the question contains confidential or personal information.

11.6 The instructor will attempt to answer every student's email received **within three business days** of receiving the message unless the email requests information already posted on the official discussion boards, as an announcement, or in the course outline.

11.7 To ensure that all announcements are received, **students are expected to check their email on a daily basis.** Students are still responsible for reading the course announcement even if they have turned off the announcement forwarding in BrightSpace.

12.   University Policies

Collaboration: **Assignments must be done individually** and should be your work. For assignments, you are encouraged to discuss your thoughts and ideas with classmates. However, you cannot share code with classmates or submit anything except your work.

Cheating: Cheating is strictly prohibited during an exam. It includes copying another person's work, sharing your work with another person, or in any way conspiring to dishonestly get a grade.

Student Academic Integrity Policy
Every student should be familiar with the Carleton University student academic integrity policy. A student violating academic integrity standards may be awarded penalties ranging from a reprimand to receiving an F grade in the course or even being expelled from the program or university. For more information, please visit: https://carleton.ca/registrar/academic-integrity/

Sharing assignment or quiz specifications or posting them online (to sites like Chegg, CourseHero, OneClass, etc.) is always considered academic misconduct (at any time, even after the course has concluded). You are only permitted to post, share, or upload course materials (even for portfolio purposes) if you receive explicit permission from your instructor. Academic integrity offenses are reported to the office of the Dean of Science.

Academic Calendar: For Carleton's academic year, including registration and withdrawal dates, see Carleton's Academic Calendar at: https://calendar.carleton.ca/academicyear/

Academic Accommodations for Students with Disabilities:
If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or

pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC 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 your instructor as soon as possible to ensure accommodation arrangements are made. For more details, visit: https://carleton.ca/pmc

Pregnancy Obligation: Please contact your instructor 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:
https://carleton.ca/womensstudies/resources-and-links/equity-services/

Religious Obligation: Please contact your instructor 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:
https://carleton.ca/equity/focus/discrimination-harassment/religious-spiritual-observances/

University Policies of Accommodation for Student Activities
Carleton University recognizes the substantial benefits to the individual student and the university resulting from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform nationally or internationally. Please contact your instructor 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, see the policy at:
https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf.