# SENG275: Software Testing

## Course Dates

| | |
|---|---|
| CRN(s): | Section A01 CRN: 30780 |
| Term: | 2023 |
| Course Start: | 2023-05-03 |
| Course End: | 2023-08-18 |
| Withdrawal with 100% reduction of tuition fees: | 2023-05-15 |
| Withdrawal with 50% reduction of tuition fees: | 2023-06-04 |
| Last day for withdrawal (no fees returned): | 2023-06-28 |

## Scheduled Meeting Times (M=Mon, T=Tue, W=Wed, R=Thu, F=Fri)

| Section: | Location: | Classes Start: | Classes End: | Days of week: | Hours of day: | Instructor: |
|---|---|---|---|---|---|---|
| A01 | COR A125 | 2023-05-03 | 2023-07-28 | TWF | 12:30-13:20 | Navneet Popli |
| B01 | ECS 342 | 2023-05-15 | 2023-07-28 | T | 13:30-15:20 | |
| B02 | ECS 342 | 2023-05-15 | 2023-07-28 | W | 13:30-15:20 | |
| B03 | ECS 342 | 2023-05-15 | 2023-07-28 | W | 15:30-17:20 | |

## Instructor(s)

Name: **Navneet Popli**
Office: EOW 421
Phone: (250)472-5327
Email: npopli at uvic dot ca

| Office Hours: | | Comments |
|---|---|---|
| Tue | 02:00pm-03:00pm | EOW 421, Some prior information about the meeting would be appreciable. |
| Fri | 02:00pm-03:00pm | EOW 421, Some prior information about the meeting would be appreciable. |

## Course Overview

This course is a practical introduction to testing in a modern software development environment. The purpose of the course is to give you working knowledge of testing and software development practices so you are prepared for “real world” software testing. Through a combination of labs, assignments, and practical exercises, you will gain experience applying testing techniques to a non-trivial software product.

## Topics

- Testing Techniques:
  - Specification-based testing
  - Boundary Testing
  - Structural Testing (and Measuring Coverage)
  - Design-by-Contracts
  - Property-based Testing
- Pragmatic Software Testing:
  - The Testing Pyramid
  - Unit Testing Frameworks
  - Test-Driven Development ("Test-First") and Refactoring

    - Mock Objects and Test Doubles
    - Design for Testability
    - Test Code Quality and Engineering
    - Pair Testing
- Test Organization and Environment
    - Developer Testing Workflow
    - Principles of Software Testing and Test Properties
    - Software Defect Tracking
    - Test Reporting and Ticketing
    - Testing in Agile, CI/CD and DevOps
- Testing in Context (and Non-Functional Testing)
    - Web Testing using Selenium IDE and scripts
    - Database Testing
    - Security Testing
    - Mutation Tesing (Some of the topics may not get covered due to pausity of time.)

## Course Objectives And Learning Outcomes

Students successfully completing SENG 275 will be able to:

1. Distinguish among and choose from appropriate testing techniques.
2. Describe the goals, approaches and principles of software testing.
3. Understand pragmatic software testing, ticketing and test reporting.
4. Evaluate test organization and environment.
5. Implement test cases and employ tools for automated execution of tests.
6. Explain test coverage for a software product

## Textbooks

Textbook: Effective Software Testing: A Developer's Guide, by Mauricio Aniche, Manning Publications, ISBN 978-1-6334-3993-1

Reference book: Foundations of Software Testing, ISTQB Certification, Dorothy Graham, Erik van Veenendaal, Isabel Evans, Rex Black, Cengage publications, ISBN 978-1-4737-6479-8.

## Assignments

There will be 3 assignments worth 20% of the total grade (Assn 1: 7%, Assn 2: 7%, Assn 3: 6%).

## Labs

The lab assignments will be worth 20% of the course grade. There will be approximately 10 labs in the course each worth 2%. Students are graded on 3-5 exercises per lab. Exercises are either programming tasks (writing java tests against a variety of software behaviour) or conceptual tasks (written responses to theory or pragmatic questions). Students must attend the lab section in which they are registered. If they fail to submit their lab work by the defined due date, they will not be graded for that lab (a score of 0 for that lab). Some lab work may involve pair or group work.

## Exams

There will be 3 Midterm Exams 10% each. There will be one Final Exam of 20% weight. Students are strongly advised not to make final plans for travel or employment during the final exam period since special arrangements will not be made for examinations that may conflict with such plans.

| Exam | Weight | Assigned Date | Due Date |
|---|---|---|---|
| Assignment 1 | 7% | 30-05-2023 | 10-06-2023 |
| Assignment 2 | 7% | 24-06-2023 | 05-07-2023 |
| Assignment 3 | 6% | 19-07-2023 | 28-07-2023 |
| Midterm Exam 1 | 10% | | 30-05-2023 |
| Midterm Exam 2 | 10% | | 27-06-2023 |

| Exam | Weight | Assigned Date | Due Date |
|---|---|---|---|
| Midterm Exam 3 | 10% | | 26-07-2023 |
| Labs | 20% | | TBD |
| Final Exam | 30% | | TBD |

## Grading

In order to pass the course, a student must obtain a passing grade in all of the following four items:

- an overall passing course grade;
- a passing grade on the average of the lab assignments;
- a passing grade on the average of the midterm exams;
- a passing grade on the average of the assignments;
- a passing grade on the final exam.

## Grading System

The University of Victoria follows a percentage grading system in which the instructor will submit grades in percentages. The University will use the following Senate approved standardized grading scale to assign letter grades. Both the percentage mark and the letter grade will be recorded on the academic record and transcripts.

| F | D | C | C+ | B- | B | B+ | A- | A | A+ |
|---|---|---|---|---|---|---|---|---|---|
| 0-49 | 50-59 | 60-64 | 65-69 | 70-72 | 73-76 | 77-79 | 80-84 | 85-89 | 90-100 |

| Grades | Description |
|---|---|
| A+, A, A- | **Exceptional**, **outstanding** or **excellent** performance. Normally achieved by a minority of students. These grades indicate a student who is *self-initiating*, *exceeds expectation* and has an *insightful* grasp of the subject matter. |
| B+, B, B- | **Very good**, **good** or **solid** performance. Normally achieved by the largest number of students. These grades indicate a *good* grasp of the subject matter or *excellent grasp in one area balanced with satisfactory grasp in the other areas*. |
| C+, C | **Satisfactory**, or **minimally satisfactory**. These grades indicate a *satisfactory performance and knowledge* of the subject matter. |
| D | **Marginal Performance**. A student receiving this grade demonstrated a *superficial grasp* of the subject matter. |
| F | **Unsatisfactory performance**. Wrote final examination and completed course requirements; no supplemental. |

## Posting of Grades

Typically marks for assignments, examinations, and provisional final grades, are made available through a Learning Management System (LMS) like Brightspace, where each student will be able to view only their own grades. Sometimes numerical marks/grades may be posted publicly to the entire class. In that case, full student numbers or names will not be included with the posted information.

## Course Experience Survey (CES)

I value your feedback on this course. Towards the end of term you will have the opportunity to complete a confidential course experience survey (CES) regarding your learning experience. The survey is vital to providing feedback to me regarding the course and my teaching, as well as to help the department improve the overall program for students in the future. When it is time for you to complete the survey, you will receive an email inviting you to do so. If you do not receive an email invitation, you can go directly to the CES site

You will need to use your UVic NetLink ID to access the survey, which can be done on your laptop, tablet or mobile device. I will remind you closer to the time, but please be thinking about this important activity, especially the following three questions, during the course.

- What strengths did your instructor demonstrate that helped you learn in this course?
- Please provide specific suggestions as to how the instructor could have helped you learn more effectively.
- Please provide specific suggestions as to how this course could be improved.

## Csc Student Groups

The Computer Science Course Union (https://onlineacademiccommunity.uvic.ca/cscu/) serves all students who are either in a computer science program or taking a class in computer science. Please sign yourself up on their mailing list if you would like to be informed about their social events and services.

The Engineering Students' Society (ESS) serves all students registered in an Engineering degree program, including Software Engineering (BSEng). For information on ESS activities, events and services navigate to http://www.engr.uvic.ca/~ess .

## Course Policies And Guidelines

***Late Assignments:*** No late assignments will be accepted unless prior arrangements have been made with the instructor **at least 48 hours before** the assignment due date. ***Coursework Mark Appeals:*** All marks must be appealed **within 7 days** of the mark being posted. ***Attendance:*** We expect students attend all lectures and labs. It is entirely the students' responsibility to recover any information or announcements presented in lectures from which they were absent. ***Electronic devices in labs and lectures:*** No unauthorized *audio* or *video* recording of lectures is permitted. ***Electronic devices in midterms and exams:*** Calculators are only permitted for examinations and tests if explicitly authorized and the type of calculator permitted may be restricted. No other electronic devices (e.g. cell phones, pagers, PDA, etc.) may be used during examinations or tests *unless explicitly authorized*. ***Plagiarism:*** Submitted work may be checked using plagiarism detection software. Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult the link given below for the UVic policy on academic integrity. Note that the university policy includes the statement that "A largely or fully plagiarized assignment should result in a grade of F for the course."

The Faculty of Engineering and Computer Science Standards for Professional Behaviour are at https://www.uvic.ca/ecs/_assets/docs/student-forms/professional-behaviour.pdf U.Vic guidelines and policy concerning fraud and academic integrity are at http://web.uvic.ca/calendar/undergrad/info/regulations/academic-integrity.html ***U. Vic Privacy Policy:*** If any student has concerns about their private information being stored or accessed outside of Canada, they are required to inform the course instructor about their concerns before the end of second week of classes.

## Equality

This course aims to provide equal opportunities and access for all students to enjoy the benefits and privileges of the class and its curriculum and to meet the syllabus requirements. Reasonable and appropriate accommodation will be made available to students with documented disabilities (physical, mental, learning) in order to give them the opportunity to successfully meet the essential requirements of the course. The accommodation will not alter academic standards or learning outcomes, although the student may be allowed to demonstrate knowledge and skills in a different way. It is not necessary for you to reveal your disability and/or confidential medical information to the course instructor. If you believe that you may require accommodation, the course instructor can provide you with information about confidential resources on campus that can assist you in arranging for appropriate accommodation. Alternatively, you may want to contact the Centre for Accessible Learning located in the Campus Services Building.

The University of Victoria is committed to promoting, providing, and protecting a positive, and supportive and safe learning and working environment for all its members.

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