



**Department of Computer Science**

# **CS 4470Y - Software Maintenance and Configuration Management**

**Course duration: September to April (of the following year)**

**Course Outline - Sep. 2023 – Apr. 2024**

## **Course Description**

At the core, software maintenance involves taking existing software artefacts, understanding them, and then modifying or extending the code and/or other work products associated with the software (such as requirements, design and test suites). Other aspects, such as migrating a system from one platform to another, reverse-engineering (i.e., extracting higher-level artefacts such as design from code), and inter-connecting existing systems for inter-operability, are also part of this field. It is estimated that 60-70% of the software development effort in industry is maintenance and evolution. In this course, students will get practical experience in this field, working in a team, and addressing real-world issues of third-party systems.

Software maintenance requires at least three kinds of knowledge:

- **Domain knowledge**: knowledge about the area of application of the software (e.g. bus transportation in the city, management of physical plants, “smart city” operations, analysing genres of music, healthcare management, extracting relevant information from legal documents, improving software development, to name a few), the users of the system, other systems interacting with the one being maintained, and other.
- **Technology knowledge**: knowledge about the various software tools, languages, packages and technologies used in the software (e.g., iOS, Android, PHP, Java, application-specific technologies, etc.), Machine Learning, data processing techniques, etc.
- **Code knowledge**: knowledge about the actual code, documentation, test cases and so on.

Students are anticipated to acquire all these three types of knowledge as appropriate for their projects.

**Class time: Mondays 11.30 AM – 12.30 PM.**

We will handle this class online except for specific (and as needed) in-person classes:

**In-person venue and dates:**

- MC 320 -- Monday, 11th September, 2023. 11.30 AM - 12.30 PM.
- MC 325 -- Monday, 8th January, 2024. 11.30 AM - 12.30 PM.

**Online dates:** as needed and announced on OWL.

**Prerequisites:**

Computer Science 3307A/B/Y; plus 1.5 courses from: Computer Science 3305A/B, 3331A/B, 3340A/B, 3342A/B, 3350A/B; plus registration in the Minor in Software Engineering

**Note:** *Unless you have either the prerequisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be*

appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

## Instructor Information

**Instructor:** Nazim Madhavji

**Office Hours:** by appointment.

**E-Mail (weekdays 9 AM to 5 PM):** [madhavji <<<at>> <gmail>> <<<com>>>](mailto:madhavji@uwo.ca)

## Course Texts

There are no required texts for this course.

To assist with project development, there are many excellent references available. In particular, check:

- CS3307A (OO Development) course text.
- CS4473B (Requirements Engineering) course text.
- CS4471A (Software design and architectures) course text.

## Lectures

Lecture time will not be used for the delivery of lectures in the traditional sense. Instead, this time will be primarily used for status checks of various projects. Apart from the dates indicated above, further in-person or online classes will be announced on OWL as needed.

## Course Webpage and OWL

The CS4470Y webpage is accessible through the departmental website. Class and project information and announcements will be posted on OWL. You are responsible for reading this information on a regular basis.

## Computing Facilities

Each student will have access to an account on the Computer Science Department undergraduate computing facility and abide by the department's [Rules of Ethical Conduct](#)

**Note:** After-hours access to certain Computer Science lab rooms is by student card. If a student card is lost, a replacement card will no longer open these lab rooms, and the student must bring the new card to the Systems Group. Likewise, if a student card ceases to provide access where it should, it should be brought to the Systems Group as well.

## E-Mail Contact

We will occasionally need to send e-mail messages to the whole class, or to students individually. E-Mail will be sent to the UWO e-mail address assigned to students by Information Technology Services (ITS), i.e. your e-mail address @uwo.ca. It is each student's responsibility to read this e-mail on a frequent and regular basis, or to have it forwarded to an alternative e-mail address if preferred. See the ITS website for directions on forwarding e-mail.

However, you should note that e-mail at ITS (your UWO account) and other e-mail providers may have quotas or limits on the amount of space they can use. If you let your e-mail accumulate there, your mailbox may fill up and

you may lose important e-mail from your instructors. Losing e-mail that you have forwarded to an alternative e-mail address is not an excuse for not knowing about the information that was sent.

Wherever you receive e-mail, be sure to configure your spam filter to allow e-mail from the instructor's e-mail address given above. Otherwise, important messages could get trapped by your spam filter and missed. This is also not an excuse for not knowing about information that has been sent.

## Student Evaluation

Grades will be based on group project work, divided across the specified set of milestones as indicated in the table below. If for any reason the project schedule given below cannot be adhered to, the project marks will be prorated accordingly.

## Project

### Milestones and Deliverables

Milestones	Deliverable Description***	Due date	Weight %
1	Progress Report (PR) 1	27 <sup>th</sup> November, 2023	Completeness check. *** Minus 10% for late submission.
2	PR 2	12 <sup>th</sup> February, 2024	Completeness check *** Minus 10% for late submission.
3	FINAL Report  <i>All project documentation, software artefacts (such as design, test cases, program code, etc.), Project results, etc., are to be delivered to the supervisor. Without this delivery, a mark of zero will be given for the course.</i>	1 <sup>st</sup> April, 2024	50
4	Project presentation (To be Scheduled)	1-15 April, 2024	50
	<i>Classes end</i>	<i>8th April, 2024</i>	

### \*\*\* EXTREMELY IMPORTANT:

**(1) All deliverables are mandatory. A course grade of zero will be recorded for the group if there are any missing deliverables.**

**(2) Please note that final report delivery date and presentation date (TBA) are FIRM (exception being through university accommodation). The MAXIMUM grade attainable due to any missing deliverable is "C".**

**(3) Presentations: All presentations will be online. (Details to be accounted via OWL.) Please make sure that EACH GROUP MEMBER is present for the date and time of your presentation.**

**A member will receive a grade of zero mark for the presentation component if not present during group presentation.**

**No employment reasons, family trips, or other reasons that preclude you from making your presentation will be acceptable. Exceptions as per the university policy.**

### Use of Third Party software artefacts

- Use of open source third party software artefacts (e.g., code, design, architecture, requirements, etc.) is permitted subject to any restrictions indicated at source. Illegal use of third party material will result in an academic offence.
- Use of third party artefacts must be explicitly cited in your documentation.

### Submission of Milestones

- All milestone deliverables will be submitted to OWL.

### Late Submissions

- **Please note: Late milestones submissions will not be accepted. Final report and presentations will take place firmly on the scheduled date. No extensions will be possible.**
- If you have serious medical or compassionate grounds for an extension, you **must** take supporting documentation to the Academic Counselling unit of your faculty for advice.

### Core Regulations

- Projects will be carried out in groups formed at the outset. However, the Dept. reserves the right to take exceptional measures. Student requests for single-person group will not be entertained.
- Project supervisor can be changed only PRIOR to an agreement is made with the supervisor. The supervisor-student-group relationship is bound once the agreement has been made.
- Supervisor selection is an asynchronous process. Any group of students or an individual student can contact any supervisor independently.
- Student acceptance by a supervisor is the prerogative of the supervisor; the course instructor will not interfere in that process.
- Any individual student (or group) can solicit another student to form or join their group (subject to the size limit in the project description and subject to the acceptance by the supervisor if committed already).
- The project topic can be changed (**only with the same supervisor**) subject to the approval of the course instructor.
- Further regulations (implicit or discovered in real-time): There may be other issues that may crop up that are not listed above. The course instructor reserves the right to make the final decision on those issues and they may not be appealed.

## Accommodation and Accessibility

### Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>.

### **Accommodation Policies**

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic Accommodation\\_disabilities.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf).

### **Academic Policies**

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

In accordance with policy,

[https://www.uwo.ca/univsec/pdf/policies\\_procedures/section1/mapp113.pdf](https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf),

the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner.

**Scholastic offences** are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

[http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/scholastic\\_discipline\\_undergrad.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf).

### **Support Services**

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>.

Students who are in emotional/mental distress should refer to Mental Health@Western (<https://uwo.ca/health/>) for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If

you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at

[https://www.uwo.ca/health/student\\_support/survivor\\_support/get-help.html](https://www.uwo.ca/health/student_support/survivor_support/get-help.html).

To connect with a case manager or set up an appointment, please contact [support@uwo.ca](mailto:support@uwo.ca).

You may wish to contact Accessible Education at

[http://academicsupport.uwo.ca/accessible\\_education/index.html](http://academicsupport.uwo.ca/accessible_education/index.html)

if you have any questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (<https://learning.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Additional student-run support services are offered by the USC, <https://westernusc.ca/services/>.