SOEN 6431 – Summer 2021
Software Comprehension and Maintenance
Course Outline

Instructor	**Amin Ranj Bar** – Office: ONLINE
	E-mail: amin.ranjbar@concordia.ca
	Office Hours: Wednesday, 17:15-18:30 by appointment only
Lectures	Wednesday 14:45-17:15

COURSE DESCRIPTION

The course addresses both technical and managerial views of software comprehension and software maintenance issues. Topics covered in this course include: cognitive models, software visualization, CASE tools, reverse engineering, static and dynamic source code analysis, software configuration management, and introduction to current research topics in software maintenance and program comprehension. A project is required.

Prerequisite Knowledge:
Proficiency in Java and/or C/C++. Essential is an understanding of software engineering. While not necessary, it is beneficial if you have worked on or taken courses in software design, software architecture, software process, and software requirements and specification. These would be helpful in understanding the issues and challenges related to maintaining and managing evolvable software systems.

TEXTBOOK AND OTHER SUPPORT MATERIALS

This course is based on a series of research papers and open source book chapters together with lecture notes. Great thanks to professors Rilling for providing his lecture notes.
Note: Check the Moodle for important notices that you must read, lecture notes, projects, etc.

WORKLOAD AND GRADING

- Assignments (2): 10%
- Project (including the presentation): 30%
- Midterm Exams: 30% + 30%

To pass the course, you should pass each component of the course (Assignment, project and the exams). You must have at least 50% total mark, as well as in the combined examinations mark in order to pass the course.

1. Assignments: There will be a total of 2 theoretical assignments. While discussions among students are encouraged, each 5 students must provide their solutions. The contribution of all the members of the team will have to be shown in an irrefutable way. The due dates of the assignments must be respected. Please note that all assignments will be placed on the website (Moodle, see below). All assignments must be submitted electronically on Moodle.

2. Project: The project aims at practicing the software comprehension techniques taught during the lectures. It will be completed in terms of a group with size 5. A presentation is required to describe the outcome of the project.

2. Exams: The exams will done online by using Moodle whose goal are to individually test the comprehension of the material taught in class. The second midterm examination covers the materials from the entire semester, including lectures, research papers. Passing the exams is necessary for passing the course.

Grading Scheme: There are no pre-set cutoff points for the final grades; the cutoff points will be decided based on an assessment of difficulty level, class performance, fairness, and instructor's wisdom from teaching and grading the course in the past. That is, there is no definite rule for translation of number grades to letter grades.

Policy: You may ask for a make-up exam or later submission of project sprints ONLY under a university-approved condition, such as sickness with a doctor's note. Other events such as a business travel are not excused. You should make the request for a mark-up exam or a later submission of a project sprint before the date of the corresponding exam and the deadline for the corresponding assignment, respectively. In particular for exams, you need to inform me at least one week in advance, unless it is an emergency. Note that, your request is not accepted, until you receive an explicit confirmation from me. Do keep the confirmation as a proof. No exception.

WEBSITE AND OTHER RESOURCES

All announcements to the students will be made through the myconcordia portal. Thus it is very important for all students to regularly read e-mail coming into the address they have provided to the portal. All course material, as well as the weekly schedules and due dates, will be provided on the course web site (see the address above).

TENTATIVE COURSE OUTLINE		
Topics	**Week**	**Date**
Course overview, Introduction to software Evolution, Software Aging	1	12 May
Software Maintenance. Program comprehension	2	19 May
Program Analysis, Software Traceability	3	26 May
Software Repository, Control Flow Analysis	4	2 June
Source Code Analysis, Data Flow Analysis	5	9 June
Midterm Exam-1: 2 hours, online	6	16 June
Software Analytics: Program Slicing	7	23 June
Software Analytics: Program Slicing + Clone Detection	8	30 June
Refactoring, Impact Analysis	9	7 July
Software Migration	10	14 July
Midterm Exam-2: 2 hours, online	11	21 July
Project Presentation (schedule will be posted)	12	28 July
Final Presentation(schedule will be posted) and Submission of final project deliverables	13	4 August

Conditions Specific to Remote Teaching and Assessment

1. All students are expected to have access to a computer with following capabilities:
   a. reliable internet connection
   b. camera and microphone (your computer and/or cellphone)
   c. document scanning application such as Adobe Scan app
      (https://play.google.com/store/apps/details?id=com.adobe.scan.android&hl=en_CA)

2. All students should install VPN for remote desktop access to Concordia University computer labs
   https://www.concordia.ca/it/support/connect-from-home.html

Once you have VPN connection to Concordia University, you can access to all available software in Gina Cody School labs by following the process described in:
https://www.concordia.ca/ginacody/aits/support/faq/connect-from-home.html

3. Download Microsoft Office 365: https://www.concordia.ca/it/services/office-365-education.html

4. All students are expected to do online, timed exams
   a. Midterms will be through Moodle Quiz/Assignment using live-invigilation

   For live ZOOM based exams

   Please note the following with respect to online live proctored exams:

   - That the exams will take place at the designated date and time set by the professor (midterms). All exam times will be set to Eastern Standard Time.
   - That your image, voice and screen activity *may* be recorded throughout the duration of the exam.
   - That you must show your Concordia University Identification card to validate your identity. Alternative government-issued photo identification will be accepted, though it is not recommended. Only identification in English or French will be accepted.
   - That authorized university personnel will only view any recording made (if one is made) (no external entity has authorization to review the recording).
   - That you will be responsible for ensuring appropriate, properly functioning technology (webcam, a microphone, appropriate browser and an ability to download any necessary software, as well as a reliable internet connection with a minimum of a 3G connection).
   - That you should enter the virtual test site and become familiar with the software that will be used for your exam before starting the exam.
   - That you will need a quiet place within which to take the exam. Earplugs or noise-cancelling headphones that are not connected to a device may also be used to allow you to focus for the duration of the exam.

5. **Course instructor reserves the right to conduct an individual oral examination to verify student's response to online exam questions**

RIGHT AND RESPONSIBILITIES

Plagiarism

The most common offense under the Academic Code of Conduct is plagiarism which the Code defines as "the presentation of the work of another person as one's own or without proper acknowledgement."

This could be material copied word for word from books, journals, internet sites, professor's course notes, etc. It could be material that is paraphrased but closely resembles the original source. It could be the work of a fellow student, for example, an answer on a quiz, data for a lab report, a paper or assignment completed by another student. It might be a paper purchased through one of the many available sources. Plagiarism does not refer to words alone - it can also refer to copying images, graphs, tables, and ideas. "Presentation" is not limited to written work. It also includes oral presentations, computer assignments and artistic works. Finally, if you translate the work of another person into French or English and do not cite the source, this is also plagiarism.

In Simple Words:

Do not copy, paraphrase or translate anything from anywhere without saying from where you obtained   it!
Sources: http://www.concordia.ca/conduct.html

It is expected that during class discussions and in your written assignments you will communicate constructively and respectfully. Sexist, racist, homophobic, ageist, and ablest expressions will not be tolerated.

All students must read and sign the Expectations of Originality form and submit the signed copy on Moodle by Jan 22, 2021

Intellectual Property

Content belonging to instructors shared in online courses, including, but not limited to, online lectures, course notes, and video recordings of classes remain the intellectual property of the faculty member. It may not be distributed, published or broadcast, in whole or in part, without the express permission of the faculty member. Students are also forbidden to use their own means of recording any elements of an online class or lecture without express permission of the instructor. Any unauthorized sharing of course content may constitute a breach of the Academic Code of Conduct and/or the Code of Rights and Responsibilities. As specified in the Policy on Intellectual Property, the University does not claim any ownership of or interest in any student IP. All university members retain copyright over their work.

Third-party software/website and personal information

Note that, as a part of this course, some or all of the lectures and/or other activities in this course may be recorded. Recordings will be focused on the instructor and will normally exclude students. It is possible, however, that your participation may be recorded. If you wish to ensure that your image is not recorded, speak to your instructor as soon as possible. Also, please note that you may not share recordings of your classes and that the instructor will only share class recordings for the purpose of course delivery and development. Any other sharing may be in violation of the law and applicable University policies, and may be subject to penalties.

Third-party software/website usage for work submission

Students are advised that external software and/or websites will be used in the course and students may be asked to submit or consent to the submission of their work to an online service. Students are responsible for reading and deciding whether or not to agree to any applicable terms of use. Use of this software and service is voluntary. Students who do not consent to the use the software or service should identify themselves to the course instructor as soon as possible to discuss alternate modes of participation that do not require them to give copyright or the right to use their work to a third party.
By using the external software or websites, students agree to provide and share their work and certain personal information (where applicable) with the website/software provider. Students are advised that the University cannot guarantee the protection of intellectual property rights or personal information provided to any website or software company. Intellectual property and personal information held in foreign jurisdictions are subject to the laws of such jurisdictions.

Sexual Violence Policy

Support and online training – Sexual violence policy
Concordia University is committed to creating a safe and respectful learning environment. Over the last six years, Concordia has been increasing opportunities for training and making all members aware of expectations and support available. As part of this commitment we are informing all members of the community of university resources and policies related to preventing any form of sexual violence on campus.

The SARC services are for students, staff and faculty of all genders and orientations and it's a confidential and non- judgmental resource that works from a survivor centered and trauma informed perspective. It includes: Crisis intervention, Short and long-term individual and group counselling, Referrals and accompaniment to on and off- campus resources for support and/or redress.

You can find out more about SARC services, prevention education and Concordia's policy on sexual violence by following the links below:

https://www.concordia.ca/conduct/sexual-assault.html?utm_source=vanity&utm_campaign=sarc

http://www.concordia.ca/content/dam/common/docs/policies/official-policies/PRVPA-3.pdf

For additional information, or questions, about Concordia University's commitment to preventing and responding to sexual violence you may contact:

Lisa Ostiguy, PhD Special Advisor to the Provost on Campus Life Office of the Provost and Vice-President Academic Tel: 514-848-2424 Ext: 5438 lisa.ostiguy@concordia.ca	Jennifer Drummond, M.S.W., P.S.W. Coordinator- Sexual Assault Resource Centre 514-848-2424 Ext: 3353 Concordia University, H-645 jennifer.drummond@concordia.ca

ON CAMPUS RESOURCES

HEALTH SERVICES An on-campus health clinic and health promotion center with nurses and doctors. SGW 514-848-2424 ext. 3565 LOY 514-848-2424 ext. 3575	**COUNSELLING AND PSYCHOLOGICAL SERVICES** Counsellors (licensed mental health professionals) work with students to address their mental health and wellbeing needs. SGW 514-848-2424 ext. 3545 LOY 514 848-2424 ext. 3555
ACCESS CENTRE FOR STUDENTS WITH DISABILITIES Supports students with a variety of disability conditions (including temporary disabilities arising from illness or injury). Students receive academic support for their educational experience at Concordia. acsdinfo@concordia.ca 514-848-2424 ext. 3525	**SEXUAL ASSAULT RESOURCE CENTRE** Provides confidential and non-judgemental support and services to students, staff and faculty of all genders and orientations affected by sexual violence and/or harassment. Jennifer Drummond, Coordinator jennifer.drummond@concordia.ca sarc@concordia.ca 514-848-2424 ext. 3353
STUDENT SUCCESS CENTRE Support network from first-year to graduation. You'll find one-on-one tutors, study groups, workshops as well as learning and career advisors 514-848-2424, ext. 3921	**DEAN OF STUDENTS** Supports students to enhance their Concordia experience by engaging in student life outside the classroom. Terry Kyle, Manager deanofstudents.office@concordia.ca SGW 514-848-2424 ext. 3517 LOY 514-848-2424 ext. 4239
ABORIGINAL STUDENT RESOURCE CENTRE An on-campus resource for First Nations, Métis and Inuit students that helps them make the most of the many resources available at the university. Orenda Konwawennotion Boucher-Curotte, Coordinator orenda.boucher@concordia.ca 514-848-2424 ext. 7327	**INTERNATIONAL STUDENTS OFFICE** Supporting international students with immigration documents, health insurance, social events, and workshops. iso@concordia.ca 514-848-2424 ext. 3515

STUDENT ADVOCACY OFFICE	MULTI-FAITH & SPIRITUALITY CENTRE
Advocating for students facing charges under the Academic Code of Conduct or the Code of Rights and Responsibilities. studentadvocates@concordia.ca 514-848-2424, ext. 3992	Provides a home for all those wishing to celebrate the human spirit in the widest sense of the word, through programs, events and a quiet space for reflection. Ellie Hummel, Coordinator mfsc@concordia.ca 514-848-2424, ext. 3593
CAMPUS SECURITY	**CONCORDIA UNIVERSITY STUDENT PARENTS CENTRE**
Ensures the safety of our members and campus property through prevention, surveillance, intervention, training, and education. Provides emergency medical services. security@concordia.ca 514-848-3717 (dial 1 for urgent situations; dial 2 for non-urgent situations)	An accessible space for student parents to study, share interests and develop a support network. Sumaiya Gangat, Coordinator cusp@concordia.ca 514-848-2424, ext. 2431

Please note: In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.