SOEN 342 (I, HH) Software Requirements and Specifications

Dept. of Computer Science
and Software Engineering

Syllabus – Fall 2020
Page 1 of 4

Concordia University
3 credits

Lectures: **I: Wednesday & Friday, 11:45 – 13:00,**
        HH: Thursday, 17:45 – 20:00
Instructor: **Dr. Abdelwahab Elnaka**
Email: **abdelwahab.elnaka@concordia.ca**

Lecture Room: **On-line**

Office: **EV 3.233**
Office hours:
Thursday: 4:30-5:30pm, Friday 10:30-11:30am

Calendar Course Description

Prerequisite: SOEN 341. Requirements engineering. Functional and non-functional requirements. Traceability. Test generation. Formal and informal specifications. Formal specification languages. Reasoning with specifications. Correctness issues. Verification. Lectures: three hours per week. Tutorial: one hour per week.

Learning Objectives

After you completed this course, you should have a good understanding of software requirements analysis and specification and be able to apply standard modeling techniques, such as UML, within an industry-grade project. You will also be introduced to basic techniques for formal requirements specification and verification. Finally, you will learn connections with other phases in the software engineering process, such as design and testing, and be able to apply requirements traceability, risk analysis, evaluation, and quality assurance methods.

General Information

This course has both lecture and tutorial components. You are required to attend both. Generally, lecture slides will be made available from the course Moodle web site. Note that the slides are not "lecture notes"; you are responsible for creating your own notes. However, additional study notes will be provided for each lecture, detailing the lecture's topics, learning objectives, required and supplemental readings, as well as study questions to support your learning process. For further information on this course, please refer to the syllabus slides and additional information available on Moodle.

Textbooks

We will use the following book as the primary textbook throughout the course:
- Axel van Lamsweerde: *Requirements Engineering: From System Goals to UML Models to Software Specifications.* Wiley, 2009.

Additionally, selected chapters from these books will be used for some lectures:
- Dean Leffingwell, *Agile Software Requirements: Lean Requirements Practices for Teams, Programs, and the Enterprise.* 1St ed., Addison-Wesley Professional, 2011.
- Dean Leffingwell, Don Widrig: *Managing Software Requirements: A Use Case Approach.* 2nd ed., Addison-Wesley, 2003.

  Note that you can access electronic versions of these two books for free through the Concordia Library!

These books, as well as some supplementary readings, are available on 3-hr reserve in the Concordia Webster library. Suggestions for additional readings will be provided for each lecture topic through the study notes.

Course Moodle Web Site

Amendments to this syllabus, if any, as well as other important information will be made available through the course's Moodle site. The Moodle site also provides additional reading material, as well as discussion forums for asking questions on lecture topics, exercises, exams, etc.

SOEN 342 (I, HH) Software Requirements and Specifications

**Dept. of Computer Science
and Software Engineering**

Syllabus – Fall 2020
Page 2 of 4

**Concordia University
3 credits**

Tutorials

The tutorial sections for this course (rooms subject to change) are:

Tut	HHHA	1	----F--	13:15	14:05	MOSTAFA	CANCELLED due to low enrolment, you can join Steve's tutorial at same time or any other tutorial that fits your schedule.
Tut	HHHB	1	--W----	14:45	15:35	MOSTAFA	
Tut	HHHC	1	--W----	14:45	15:35	AHMED	
Tut	I IA	2	----F--	13:15	14:05	STEVE	
Tut	I IB	2	--W----	14:45	15:35	STEVE	
Tut	I ID	2	--W----	14:45	15:35	YASAMAN	

Teaching assistants for this course:
- Mostafa Jangali: mostafa.jangali@mail.concordia.ca
- Steven Locke: swg.locke@gmail.com
- Ahmed Bataineh: ahmed_bataineh87@yahoo.com
- Yasaman Sarlati: yasaman.sarlati@yahoo.com

Communication

- All communications from the course's professors will be done through Moodle for any announcement or course related news.
- Questions to professors are to be asked during counselling hours. Professors might or might not answer questions through other means of communication as it will depend on how busy their schedule and other commitments are. So, always make sure to use the counselling office hours for this purpose.
- Students' questions to TAs regrading tutorials or assignments are to be asked during tutorial sessions. TAs are not expected to answer questions through emails or other means as the sessions are made specifically for this purpose.

Evaluation

70%   Two midterm Exams
30 %   Assignments (2-3 group assignments)

There is no standard relationship between percentages and letter grades assigned for this course. In order to pass the course you must receive at least 50% of the overall possible marks. Unless noted otherwise, all assignments are to be submitted electronically by midnight on the due date through Moodle. Late submissions will incur a penalty (see the course Moodle web site for details).

Should you fail to write or submit any of the course assessment components and you have a valid justification (e.g., doctor's note) then the weight of that component, at the instructor's sole discretion, will be either moved to another new assessment component or moved/distributed between other existing assessment components.

Note: It is your responsibility to adhere to the ***university's code of conduct*** as detailed in the calendar.

SOEN 342 (I, HH) Software Requirements and Specifications

Dept. of Computer Science and Software Engineering

Syllabus – Fall 2020
Page 3 of 4

Concordia University
3 credits

Online Examination

All students are expected to do online, timed exams

a) Both midterm will be through Moodle Quiz using live-invigilation (Alternatively) Both midterm and final exams will be through Concordia Online Exam (COLE) platform using an auto-proctoring solution. Students are encouraged to visit practice exam site to become familiar with the system.

For live ZOOM based exams

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

- That the exams will take place during the exam period at the designated date and time set by the professor (midterm) or the Exams office (final). 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 any recording made (if one is made) will only be viewed by authorized university personnel (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).

- For your online examination(s), you will need to download the appropriate browser lockdown technology and use Zoom. Protocols for entering the examination will be provided by your professor.

- 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.

For live auto-proctoring with COLE based exams

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

- That the exam will take place during the exam period at the designated date and time set by the professor (midterm) or the Exams office (final). All exam times will be set to Eastern Standard/Daylight Time.

- That your image, voice and screen activity will 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 any recording made will only be viewed by authorized university personnel (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 are very strongly recommended to enter the virtual test site found at the COLE website and become familiar with the software that will be used for your exam before starting the exam.

SOEN 342 (I, HH) Software Requirements and Specifications

Dept. of Computer Science and Software Engineering

Syllabus – Fall 2020
Page 4 of 4

Concordia University
3 credits

- 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.

b) Course instructor reserves the right to conduct an individual oral examination to verify student's response to online exam questions

Course Content and Schedule

We will cover the following topic(s) in each week (note that the weekly schedule may be subject to change):

(Week 1)   Introduction; Requirements Engineering and Software Processes
(Week 2)   Requirements Elicitation; Vision Document
(Week 3)   Requirements Evaluation, Risk Analysis
(Week 4)   Requirements Specification: Natural Language Documentation
(Week 5)   Use Case-based Requirements Specification; User Stories
(Week 6)   Formal Specification: Propositional/Predicate Logic   *Assignment #1*
(Week 7)   The Z Formal Specification Language
(Week 8)   Requirements Quality Assurance   *Midterm Exam #1*
(Week 9)   Requirements Evolution, Traceability
(Week 10) Domain Modeling: UML Class Diagrams, RDF Schema
(Week 11) UML: Sequence, Activity, and State Diagrams   *Assignment #2*
(Week 12) Test Cases   *Midterm Exam #2*
(Week 13) Requirements Engineering Tools; Conclusions & Outlook

There will not be time to cover all of these topics in depth. Other topics of interest to the class may also be included. More details for each topic will be made available on the Moodle web site.

Graduate Attributes

As part of the Software Engineering program curriculum, the content of this course includes material and exercises related to the teaching and evaluation of graduate attributes. Graduate attributes are skills that have been identified by the *Canadian Engineering Accreditation Board* (CEAB) and the *Canadian Information Processing Society* (CIPS) as being central to the formation of Engineers, computer scientists and information technology professionals. As such, the accreditation criteria for the Software Engineering and Computer Science programs dictate that graduate attributes are taught and evaluated as part of the courses. The following is the list of graduate attributes covered in this course, along with a description of how these attributes are incorporated in the course.

Attribute 1: A knowledge base for engineering. Knowledge of the requirements engineering process. The different kinds of requirements and their relationships. Relationships between requirements, design, implementation and testing artifacts. Test generation. Formal and informal specifications. Formal specification languages. Reasoning with specifications. Correctness issues. Verification.

Attribute 2: Problem analysis. Practical use of various techniques for requirements elicitation. Use of formal specification languages for the expression and analysis of requirements. Use of techniques and tools for reasoning about requirements and specifications, including verification.

Disclaimer

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