Concordia University

Concordia Institute for Information Systems Engineering

INSE 6260/4/UU - Software Quality Assurance (Winter 2015) (4 credits)

1. General Information

- Course: INSE 6260/4/UU – Software Quality Assurance (4 credits)
- Lectures: Tuesday, 17:45 – 20:15, **B-040**
- Instructor: Jamal Bentahar, *Ph.D., P.Eng.*, Concordia Institute for Information Systems Engineering, ENCS.
- Office: EV7.630, extension 5382, bentahar@ciise.concordia.ca
- Office Hours: Fridays from 10:30 a.m. to 12:00 p.m. or by appointment.
- Course Website: http://www.ciise.concordia.ca/~bentahar/inse6260.html

  You can use this web site to get lecture notes, useful links, assignments, and other useful information. It is highly advised to visit the web site regularly.

  User: **Password**

2. Course Description

- This course presents the main issues of quality assurance for software engineering. It introduces software quality challenges and factors and the main quality considerations for software. The following issues will be covered: quality assurance, quality factors, components of a software quality assurance system, contract review, software development and quality plans, activities and alternatives, integration of quality activities in a project lifecycle, reviews, software inspection, software verification, testing processes, static analysis, control-flow analysis, data-flow analysis, control-flow testing, loop testing, data-flow testing, transaction-flow testing, domain testing, type-based analysis, dynamic analysis, usage models, operational profiles, result and defect analysis, reliability, performance analysis, maintenance and reverse engineering, case tools and software quality assurance. Students will discover various concepts and techniques developed in recent research about software quality engineering and learn to apply them through lectures, readings, assignment, and team project. Several materials from different sources will be used, particularly scientific papers.
- Prerequisites: INSE 6210, COMP 5541 or equivalent. **Good knowledge of mathematics and logics will be very helpful**

3. Learning Outcomes

- By the end of this course, students should be able to:
    1. Understand software quality assurance principles.
    2. Be able to apply those principles for concrete and complex projects.
    3. Understand and apply different testing techniques for software.

4. Schedule

- Week 1: Introduction to Software Quality Assurance.
- Week 2: Software Quality Factors, Models and Standards.
- Week 3: Inspection: Verification and Validation.
- Week 4: Reachability Analysis.
- Week 5: Introduction to Testing.
- Week 6: Testing Techniques I.
- Week 7: Testing Techniques II.
- Week 8: Testing Techniques III.
- Week 9: Metrics
- Week 10: SDL
- Week 11: Student Presentations and Discussions.
- Week 12: Student Presentations and Discussions.

5. Course Materials

- Textbook:
    - **Lecture Notes + Papers**
- Readings:
    - **1)** *Software Quality Assurance: From Theory to Implementation*
      By Daniel Galin, Addison Wesley, 2012
        - ISBN: 0-201-70945-7
        - This book covers several issues related to software quality assurance. Some important chapters are: software quality challenge, what is software quality, software quality factors, and software testing.
    - **2)** *Metrics and Models in Software Quality Engineering*
      By Stephen H. Kan, Addison-Wesley, 2010 (available online)
        - ISBN: 0-201-72915-6
        - This book is a reference in software metrics. It covers a comprehensive breadth of measurement theory and software quality metrics.

6. Assignments and Grading

1. Assignment (3 members): 10%
2. Midterm Exam (closed book): 25%
3. One team project (3 members, presentation + report) 30%

4. Final Exam (closed book): 35%

- **Details:**

1. Homework Assignment (1): must be done in group of 3 (the same group as the project). Tentative due date is: March 10, 2015.

Late assignments suffer a penalty rate of 20% per day, up to 5 days (weekends count towards the 5 days). Assignments that are more than 5 days late are penalized by 100%. The solutions will be posted on the course website. **No submissions will be allowed after the solutions are published.**
Submit the signed **Expectations of Originality form** with each homework assignment.

2. Midterm Exam: will focus on the first 7 Lectures.
3. Final Exam: will take place at the end of the semester. Students should not make any specific arrangements to leave the city until the final exam date is posted.

- **Failing Grade:**

Plagiarism, absenteeism, lack of preparation, and lack of effort will result in a failing grade.

7. Academic Code of Conduct

Academic Integrity

Any form of cheating, plagiarism, personation, falsification of a document as well as any other form of dishonest behaviour related to obtaining academic gain or the avoidance of evaluative exercises committed by a student is an academic offence under the Academic Code of Conduct and **may lead to severe penalties up to and including suspension and expulsion.**
As examples only, you are not permitted to:

- Copy from anywhere without indicating where it came from
- Let another student copy your work and then submit it as his/her own
- Hand in the same assignment in more than one class
- Have unauthorized material or devices in an exam. Note that you do not have to be caught using them – just having them is an offence
- Copy from someone's else exam
- Communicate with another student during an exam
- Add or remove pages from an examination booklet or take the booklet out of an exam room
- Acquire exam or assignment answers or questions
- Write an exam for someone else or have someone write an exam for you
- Submit false documents such as medical notes or student records
- Falsify data or research results

You are subject to the Academic Code of Conduct. Take the time to learn more at
http://provost.concordia.ca/academicintegrity/

8. Student's Responsibilities

- Students are expected to attend every class. Some material may only be covered in class and not made available on the course website. Students are expected to read the assigned material and to actively participate in class discussions.
- Students are expected to be respectful of other people's opinions and to express their own views in a calm and reasonable way. Disruptive behaviour will not be tolerated.
- Students are expected to be familiar with the Code of Rights and Responsibilities: http://rights.concordia.ca
- If you cannot attend class for any reason, unforeseen or not, you are to come and talk or write to me as soon as possible.

9. Student Services

- **Concordia Counselling and Development** offers career services, psychological services, student learning services, etc. http://cdev.concordia.ca
- **The Concordia Library Citation and Cycle Guides:** http://library.concordia.ca/help/howto/citations.html
- **Advocacy and Support Services:** http://supportservices.concordia.ca
- **Student Transition Centre:** http://stc.concordia.ca
- **New Student Program:** http://newstudent.concordia.ca
- **Office for Students with Disabilities:** http://supportservices.concordia.ca/disabilities/
- **The Academic Integrity Website:** http://provost.concordia.ca/academicintegrity/