



Concordia University
Concordia Institute for Information Systems Engineering
INSE 6280/2/WW-Quality Assurance for Systems Engineering
(Fall 2008)

Time: Thursday, 17h45 – 20h15
Classroom: CL-225
Office hours: Wednesday, 10h00 – 12h00 or by appointment (Office: EV7.630)

Instructor: Dr. J. Bentahar
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Course Web: <http://www.ciise.concordia.ca/~bentahar/inse6280.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.

Textbooks:

Required

1) *Systems Engineering and Analysis*, (4th Edition), 2006
Benjamin S. Blanchard, Wolter J. Fabrycky
Prentice Hall
ISBN: 0131869779
This book covers several parts about the engineering of systems. The parts which will be covered by the course are: Part1 (Introduction to systems) and part 4 (Design for operational feasibility).

Suggested Readings

2) *Assurance Technologies Principles and Practices: A Product, Process, and System Safety Perspective*, (2nd Edition), 2006
Dev G. Raheja, Michael Allocco
Wiley
ISBN: 0-471-74491-3
This book covers the main principals of assurance technologies including quality, system safety, reliability, maintainability, human engineering, logistics, software integrity, and system integration.

Suggested Readings

3) *Principles of Model Checking*
J-P. Katoen
Formal Methods and Tools Group, University of Twente
Available online from the course web page

Description: This course is about quality assurance in systems engineering. It introduces systems engineering process and quality assurance in such a process. The following issues will be covered: quality factors in systems engineering, components of a quality assurance system, principles and techniques of Verification and Validation, system modeling languages, multi-agent systems, principles of system simulation, and High Level Architecture. Students will discover various concepts and techniques in quality assurance and learn to apply them through lectures, readings, assignments, and a team project.

Prerequisites: INSE 6210 (Total Quality Methodologies in Engineering).
Good knowledge in mathematical logic, probability, and statistics will be helpful.

Requirements:

- One individual/group assignment
- One in-class midterm exam (closed book)
- One in-class final exam (closed book)
- One team project (2~3 members, presentation + report)

Grading:

- One assignment: 16%
- Midterm exam: 25%
- Final exam: 25%
- Project (presentation + report): 17% + 17% = 34%

Project and assignment will be graded based on originality, clarity, and comprehensiveness. In-class exams will test students' knowledge and ability to understand, analyze, and synthesize concepts.

Important dates:

- Project proposal: October 02, 2008
- Assignment: October 09, 2008
- Midterm: October 23, 2008
- Project presentation: November 20, 2008
- Final exam: November 27, 2008
- Project report: December 04, 2008

Useful Links: Systems Engineering Design: <http://syseng.omg.org/>
American Society for Quality: <http://www.asq.org>
Model Checking: <http://www.cs.cmu.edu/~modelcheck/>
Multi-Agent Systems: <http://www.multiagent.com/fmas>
System Simulation: <http://www.isima.fr/ecosim/simul/simul.html>
Defense Modeling and Simulation Office (DoD):
<https://www.dmsomil/public/>

Submission: All assignments are at the beginning of class. Late assignments will incur a penalty of 20% deduction (up to 100%). No points will be given to the assignment submitted 5 days after the due date.

Policies: Cheating and plagiarisms will be very seriously considered and handled according to the Concordia Academic Code of Conduct (can be found in the graduate student handbook) without exception. Please note the schedule of the exams. A makeup test will be given only in the case of a serious illness or emergency. You must contact the instructor before the exam. Only written and proved documentations are accepted for verification purposes.

Tentative Schedule: The table below provides a brief summary of some of the material that will be covered during the term. The schedule may change slightly.

LECTURE	TOPIC	EVENT
1	Introduction to Systems Engineering	
2	Quality Assurance Engineering	
3	System Specification and Validation	
4	System Verification 1 (Temporal Logic)	
5	System Verification 2 (Model Checking)	Project Proposal
6	Reliability Engineering	Assignment
7	Introduction to System Modeling	
8	System Modeling with UML and SysML	Midterm Exam
9	Introduction to Multi-Agent Systems	
10	Advanced Multi-Agent Systems	
11	System Simulation	
12	High Level Architecture	Project Presentation
13	Final Exam	Final Exam
14	Project	Presentation + Report