



Department of Electrical and Computer Engineering

SENG 637 – Dependability, Reliability and Testing of Software Systems

Tutorial Assignments

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(Revision 1.00)

Delivery Date for all tutorials: 13/April/2010 (Tuesday)

Outline

1. The deliverable pages should be numbered and each assignment should have a cover page bearing the assignment number, student(s) name and student(s) ID number(s), and submission date. The cover page is excluded from the minimum and maximum required pages.
2. Assignments must be delivered in electronic form either by email or on a floppy, data CD or DVD disks. For electronic submission formatted documents in MS Word, HTML or PDF are only acceptable. Using other word processing software is encouraged but the output should be saved or converted to one of the above mentioned formats. Unformatted text or LaTeX files should be compiled or converted to PDF before submission. HTML formatted files are acceptable only if accompanied by all the links and inline graphics, etc., in a single file (.mht file) or archive (i.e., zipped web archive).
3. Email submissions should bear the course number, e.g., SENG 635 in the **Subject line** of the message. The maximum size of attachment is 2 megabyte. Attachments larger than 2MB should be delivered on disks. Automated virus scanners may omit certain attachment file types (e.g., exe files, ZIP or RAR archives, etc.) for emails initiated by senders from outside of the UofC. It is always safer to send email with the attachments using students' UofC email account. Submissions not complying with this may be discarded with no action. All successful submissions by email will receive an acknowledgement receipt within 3 days of submission.
4. For electronic submission, the student is responsible to have the electronic media made readable. Defective archives will be rejected and marked zero.
5. For electronic submission, the student is responsible to have the files and attachments scanned for viruses before submission. Virus infected deliverables will be deleted automatically and marked zero.

Assignments: Information Collection and Survey

Part 1

Grade : %20 of the total tutorials mark.

This assignment is an individual assignment. The goal is to increase motivation of the audience to follow the topic throughout the course by presenting them with the most fundamental questions that software reliability engineering tries to answer.

Information collection and survey

Search articles, textbooks, online materials, etc. to find answer to the following questions:

1. What is software reliability engineering (SRE)?
2. Why SRE is important? How it affects software quality?
3. What are the main factors that affect the reliability of software?
4. Is SRE equivalent to software testing? What makes SRE different from software testing?
5. How can one determine how often will the software fail?
6. How can one determine the current reliability of the software under development?
7. How can one determine whether the product is reliable enough to be released?
8. Can SRE methodology be applied to the current ways of software development: like object-oriented, component-based and agile development?
9. What are challenges and difficulties of applying SRE?
10. What are current research topics of SRE?

Write your own answers to the above questions. Quotes from articles, textbooks and online materials must be properly referenced. Submit one report per student.

Report length:

Minimum 2 standard pages report (12 pts, single spaced minimum 36 lines, letter-size paper). The report must start with a short abstract explaining what is included in the report and end with your own conclusions (or evaluation) of the topics covered.

Part 2

Grade : %50 of the total tutorials mark.

This assignment is an individual assignment. As the software reliability engineering knowledge is mainly action knowledge, the students have to gain experience with applying the SRE related knowledge. The goal of this assignment is to use the SRE techniques and concepts to solve real-life engineering problems.

Problem solving practices

A list of (20) problems to be solved will be delivered to the students within the first two weeks of the course. The students are asked to solve the problems using the knowledge gained throughout the course and deliver the solutions for marking. The students are free to use textbooks and/or SRE tools to prepare the solutions. The work should be done individually without peer consultation.

Report length:

No page limit.

Part 3

Grade : %30 of the total tutorials mark.

Write a short tutorial on one of the following topics:

1. Extensions or modifications of the SRE process for other software development processes such as Agile and iterative development.
2. SRE related data collection, testing and debugging tools.
3. How debugging and testing is conducted (your own experience and/or case study)?
4. Practical deployment of SRE in software industry (your own experience and/or case study).
5. SRE models (Weibull and Gamma models, Bayesian models, Early Life-Cycle prediction models, etc).

The tutorial should include the subject itself (what is?), assumptions, data requirements, activities involved, roles involved, tools and techniques required, and possible usage scenarios (how to?).

Report length:

Minimum 3 standard pages report (12 pts, single spaced minimum 36 lines, letter-size paper). The report must start with a short abstract explaining what is included in the report and end with your own conclusions (or evaluation) of the topics covered.

Evaluation:

The report will be marked as follows:

1. Contents of the document : 80%.
How well have you described the underlying concepts and definitions for each question?
How precise is your answer
How comprehensive is your answer.
Have you searched and compared different answers from different sources for the same question?
Did you separate the authors' ideas and those of yours clearly?

2. Presentation style and referencing : 20%
Do you have an abstract and conclusions?
Do you have references in the text?
Do you have a reference list at the end with links to papers, books or URLs where appropriate?
Do you have an acknowledgements section if you got any help from anyone?

Notes:

1. Submit one report per student.
2. Write your own answers to the above questions. Quotes from articles, textbooks and online materials must be properly referenced. Reports are evaluated comparatively with the current and previous years' reports and other online materials. In case of proven plagiarism the assignment will be marked zero and suspected cases will be reported for further investigation. Please read the section in the University Calendar on Plagiarism/Cheating/Other Academic Misconduct.
(<http://www.ucalgary.ca/pubs/calendar/current/k-2.html>)