

# Software Engineering (Programvaruteknik) Exam, 2002-01-14

Lars-Henrik Eriksson  
Insitutionen för informationsteknologi  
Uppsala Universitet

Duration 8:00 - 13:00.

- Start by reading all the questions to see if anything is unclear. I will come by around 9 o'clock to clarify questions.
- You will be provided with a form which **must** be used as the front page for your answer sheets.
- Answers may be written in Swedish or English, or any reasonable mixture of those.
- Don't use a red pen!
- Leave a margin on each sheet for comments. It is best if you use answer sheets with preprinted margins.
- Swedish-English (or your-native-language-English) dictionaries may be used.
- **Important instructions about how to answer. Failure to comply with these items may cause delayed grading, or a points deduction, or both.**
  - Don't put the answer to more than one question on each sheet!
  - You should not need more than one page for the answer to each question (given a normal size handwriting). You must not use more than two pages.
  - The handwriting should be easy to read and the answers easy to understand.
- A checklist of common mistakes that cost points:
  - Read the question again after you have written the answer. Verify that you have actually answered the question. Verify that you answered *all* parts.
  - In particular, don't forget to give an example if that is requested, and make it a concrete one.
  - Avoid unclear or missing argumentation; risky words are "of course", "self-evident", "better", "wrong", ...
  - When a question asks you to compare two things A and B, make sure to highlight the contrasts: their differences. I do *not* want a full description of A and a full description of B, leaving it to me to find the differences.
- The maximum number of grade points you can get from the exam is 50.
- 58 (70 for non-DVP students) points are required for a pass grade, while 75 (90) points are required for the VG grade. (*These limits are estimates which could be changed.*) This includes credits from assignments and participation, so a DVP student with maximum credit (20+20+10) needs only 8 points on the exam to pass the course.

Good luck!

Lars-Henrik

1. (5p.) Describe the "V" model for validation and verification. You must briefly explain the various parts of the model – simply making a "V" drawing with labels is not sufficient.
2. (4p.) Give two examples each of: a) functional product requirements, b) non-functional product requirements, c) process requirements
3. (6p.) Requirements can be formulated in various languages: natural languages, semi-formal languages and formal languages. For each class of languages: a) what are its two most important advantages?, b) what is the most important risk of using such a language?
4. (6p.) a) What are the steps of designing a system? b) Why is there no hard border between requirements specification and design? c) How is the design process altered if many reusable components are available?
5. (6p.) Give an overview of the hazard and risk analysis process.
6. (6p.) Give (at least) five different ways of testing. Explain the goal of the test, and how it is performed (don't be vague, I recommend using examples)
7. (5p.) Give arguments for and against the statement that "Reuse is the Silver Bullet"
8. (6p.) Would you want to work in a company that fully applies the Cleanroom model in every project, and that only accepts projects for which the Cleanroom model is suitable? Motivate your answer. (Since both "yes" and "no" and even "it depends" are correct answers, points are given for motivation only. Your motivation must show that you know what Cleanroom is.)
9. (6p.) What are the principal functions of a quality management system?