

Systems modeling & simulation (IV1200), 7.5hp

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Course web-page: <http://www.ict.kth.se/courses/IV1200/>
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👉 Objectives

- *to provide you with information on content of the course, its prerequisites and requirements*

👉 Outline

- *course content*
- *course literature*
- *course requirements*

Modeling & simulation techniques

👉 Content of the course

- **Part I (Basic)**
 - How to develop a discrete-Event Simulation (DES)
 - **Random number generation**
 - **Input data modeling**
 - **validation of simulation models**
 - **output data analysis**
- **Part II (advanced part)**
 - Parallel and Distributed Simulation
 - How to compare two systems or two algorithms
 - Design of experiments

👉 Course schedule

- 9 lectures
- 7 tutorials (exercises)
- 1 project assignment presentations (redovisningar)

👉 Course assessment (examination)

- 2 project assignments (compulsary)
- 2 homework assignments (optional)
- 1 written exam

👉 Course web page

Course material

☞ Main textbook

- *Discrete-Event System Simulation, Banks, Carson and Nelson, Fifth Edition, Prentice-Hall 2009*

☞ References

- *Simulation Modeling and Analysis, Law & Kelton*
- *Discrete-Event Simulation: A first course, Leemis & Park*
- *Simulation With Arena, (4th Edition), Kelton et al.*
- *Systemmodellering och Simulering, Gunnar Holm*

☞ Lecture notes: available online

☞ Tutorial notes: available online

Course requirements and Grading

☞ Prerequisites

- *Basic course in statistics*
- *Knowledge in some programming languages (C++ or Java or Python)*

☞ Requirement

- *Active participation!*
'What does it mean?'
- *Project assignments (3hp)*
- *Final exam (4.5hp)*

☞ Project assignments:

- *will be done in groups of two students*

Assignment 1:

- *Part a: Simulation of a single server system using graphical simulation tools*
- *Part b: Simulation of a single server system in C++/Java/Python*

Assignment 2:

- *Simulation of a Mobile Communication System*

Project assignments

☞ **Deadlines**

- **2011-09-05 Build your project group.**
- **2011-09-18 Report on assignment 1 is due.**
- **2011-10-06 Report on assignment 2 is due.**
- **2011-10-10 Presentation of assignments.**
- **2011-10-13 Presentation of assignments.**
- **2011-10-18 First Exam (closed book, calculator allowed).**

Project assignments and homeworks

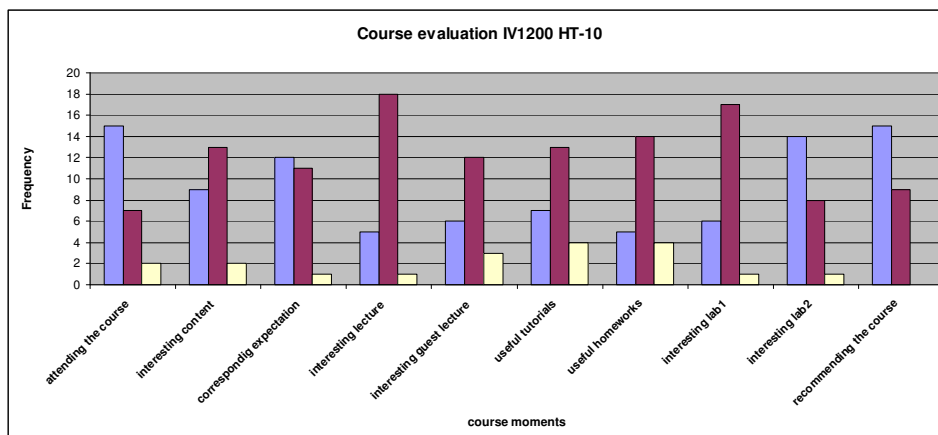
☞ **Bonus points (totally 10)**

- **Deliver your project reports before the deadline and get 8 bonus points (the written exam give max 100 points)**
 - **4 bonus points for assignment 1 and**
 - **4 bonus points for assignment 2,**
 - **if the reports are complete and are accepted, but no bonus points for incomplete reports. The bonus points are reduced by 1 p for each day after the deadline**
- **2 bonus points for delivering homework assignments**
- ☞ **The bonus points can be used to improve your final grade, if you have got grade E or above in the written exam**
- ☞ **The bonus points are valid ONLY for the exam in October 2011.**

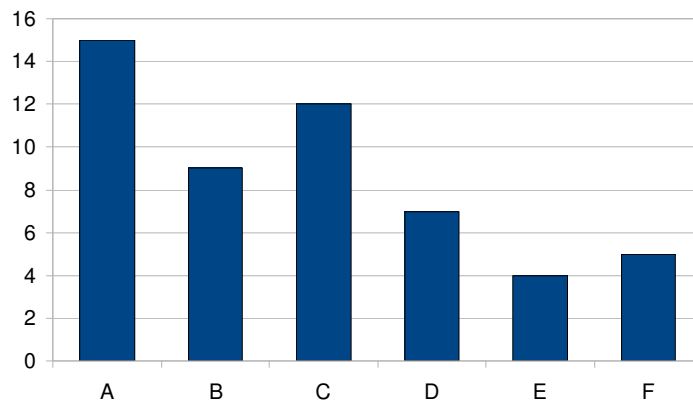
Other information

☞ Exam:

- *First exam : 18/10/2011, 9am -1pm*
- ☞ **The exam will be closely related to what is taken up in the lectures and exercises**
- ☞ **Active participation! I expect that you**
 - *participate in at least 80% of lectures and tutorial sessions*
 - *complete the project assignments before the deadline.*
- ☞ **Unfortunately we cannot provide any support for doing the project assignments after 18/10/2011.**
- ☞ **Project assignment reports delivered after this date will be marked after oral presentation in conjunction with the next exam.**



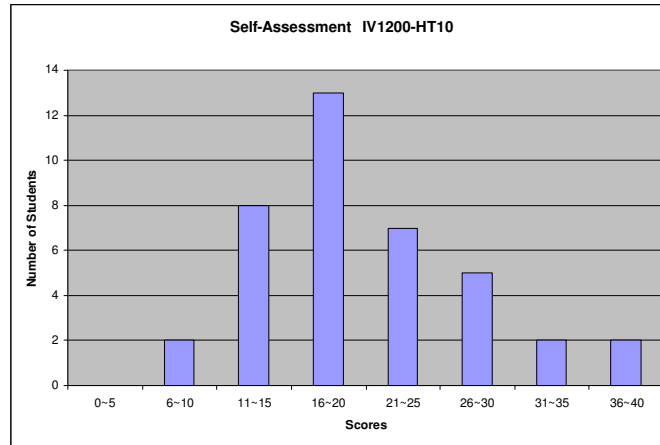
Exam results, October 2010 (52 students)



Additional info

- ☞ [Mailing list: iv1200-students@ict.kth.se](mailto:iv1200-students@ict.kth.se)
- ☞ <https://mailman.ict.kth.se/mailman/listinfo/iv1200-students>
- ☞ [Course materials on the Web are protected](#)
 - *User name: iv1200 (SMALL LETTERS!)*
 - *Password:*
 - [Course representative \(kursnämnd\): Any volunteers?](#)

Result of self-assessment, September 2010



IV1200: Self-assessment

Please mark the most appropriate answer

Assign a mark to your answer

- 0: don't know the answer
- 1: know, but not exactly
- 2: know exactly

Calculate your total score and remember it for later discussion.

QUESTION	YOUR SCORE
1. What is a simulation?	0 1 2
2. Why do we use simulation?	0 1 2
3. What is a simulation model?	0 1 2
4. What is a discrete random variable?	0 1 2
5. What is probability mass function (pmf)?	0 1 2
6. What is probability density function (pdf)?	0 1 2
7. What is cumulative distribution function (cdf)?	0 1 2
8. What is expectation $E(X)$ of a random variable?	0 1 2
9. What is variance $V(X)$ of a random variable?	0 1 2
10. Is it possible for a probability density function to have a value greater than one?	0 1 2
11. What is a random number generator?	0 1 2
12. How does a random number generator work?	0 1 2
13. What is a stochastic process?	0 1 2
14. What is a discrete system?	0 1 2
15. What is uniform distribution?	0 1 2
16. What is normal distribution?	0 1 2
17. What is exponential distribution?	0 1 2
18. What is the relationship between Poisson process and exponential distribution?	0 1 2
19. What do we test with a Chi-square test?	0 1 2
20. What is confidence interval?	0 1 2
Total score	