Blekinge Institute of Technology
Department of Technology and Aesthetics

COURSE SYLLABUS

Simulering

Simulation

7,5 ECTS credit points (7,5 högskolepoäng)

Course code: ET2596
Educational level: Second cycle
Course level: A1N
Field of education: Technology
Subject group: Electrical Engineering

Subject area: Electrical Engineering
Version: 5
Applies from: 2017-08-01
Approved: 2017-03-01

1 Course title and credit points
The course is titled Simulation/Simulering and awards 7,5 ECTS credits. One credit point (högskolepoäng) corresponds to one credit point in the European Credit Transfer System (ECTS).

2 Decision and approval
This course is established by Dean 2016-06-07. The course syllabus was revised by Head of Department of Computer Science and Engineering and applies from 2017-08-01.
Reg.no: BTH-4.1.1-0218-2017.
Replaces ET2534.

3 Objectives
The objective of the course is to give the student knowledge about using computer-based tools and event-steered simulation to model complex systems in the fields of computer and communication systems.

4 Content
• Introduction to simulation as tool
• Principles, advantages, and disadvantages of event-steered simulation, compared with alternative methods
• Verification, validation, and credibility of simulations and their results
• Event management
• Own object-oriented simulation tools in C++
• Program packets for simulation
• Realization of simulation experiments
• Creation of confidence in simulation results (through statistical analysis) with emphasis on confidence and correlation analysis
• Random numbers from different distributions and their application
• Variance reduction methods

5 Aims and learning outcomes
Knowledge and understanding
After course completion, the student should be able to:
• account for basic concepts which are associated with simulation
• describe different types of simulation and event management
• identify and explain the conditions and formulas for confidential analysis
• describe methods for generating random numbers of various distributions.
Skills and Abilities
After course completion, the student should be able to:
• configure simulation tools
• plan and conduct simulation experiments
• document simulation results including confidence intervals and correlation analysis.
Judgement and approach
After course completion, the student should be able to:
• evaluate simulation towards alternative evaluation methods
• compare and discuss parameter selections and application of different simulation related methods
• evaluate different random number generation and variance reduction methods
• analyze, interpret and compare simulation results.

6 Learning and teaching
The teaching consists of lectures and a project. Lectures convey fundamental theory, knowledge, overview and comparisons between different simulation-related methods, in both theory and with practical examples. They are the groundwork of the project work, which is for students to get practical experience with generating, reporting and interpret results from simulations. Project work consists of two parts, carried out individually or in
groups of two to three students, and presented by two assignment in both written and

oral form:
(1) a first part which is about to produce simulation results according to specification, visualize these appropriately, and explain observations; and
(2) a second part that compares different simulation results and motivate their interpretations based on the material of the lectures.
English

7 Assessment and grading
Examination of the course

Code	Module	Credit	Grade
1710	Exam	4.5 ECTS	A-F
1720	Assignment 1	1.5 ECTS	A-F
1730	Assignment 2	1.5 ECTS	A-F

The course will be graded A Excellent, B Very good, C Good, D Satisfactory, E Sufficient, FX Fail, supplementation required, F Fail.

8 Course evaluation
The course coordinator is responsible for systematically gathering feedback from the students in course evaluations and making sure that the results of these feed back into the development of the course.

9 Prerequisites
Passed/completed course in Object-oriented Programming 7,5 hp. Taken course in Mathematical Statistics 7,5 hp.

10 Field of education and subject area
The course is part of the field of education and is included in the subject area Electrical Engineering.

11 Restrictions regarding degree
The course cannot form part of a degree with another course, the content of which completely or partly corresponds with the contents of this course.

12 Course literature and other teaching material
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