



Faculty of Health, Science and Technology  
Computer Science

# Syllabus

## Performance Modeling and Simulation

**Course Code:**

DVAD15

**Course Title:**

Performance Modeling and Simulation

*Prestandamodellering och Simulering*

**Credits:**

7.5

**Degree Level:**

Master's level

**Progressive**

Second cycle, has only first-cycle course/s as entry

**Specialisation:**

requirements (A1N)

**Major Field of Study:**

DVA (Computer Science)

### Course Approval

The syllabus was approved by the Faculty of Health, Science and Technology 2020-03-11, and is valid from the Autumn semester 2020 at Karlstad University.

### Prerequisites

Upper secondary level English 6 or B, and Computer Networking I (7.5 ECTS credits), Operating Systems (7.5 ECTS credits), and Mathematical Statistics (7.5 ECTS credits), or equivalent

### Learning Outcomes

Upon completion of the course, students should be able to:

- use appropriate statistical methods to compare systems, interpret and present data,
- use analytical modeling to evaluate computer systems and network performance,
- develop and evaluate various types of simulation experiments,
- develop and evaluate various types of emulation experiments,
- assess what factors are important when choosing between different techniques for evaluating performance, and

- apply an appropriate performance evaluation method in a project and present the results orally and in writing.

### **Content**

- A review of probability and statistics, and basic principles of queuing theory.
- Analytical modeling and evaluation of computer systems and computer networks.
- Simulation-based evaluation, with a focus on discrete event simulation.
- Performance evaluation using emulation techniques.

The course is oriented toward a practical application of theory and concepts mainly to computer network performance evaluation, but also includes more general aspects on performance evaluation.

The course consists of lectures, laboratory sessions, and a project.

### **Reading List**

See separate document.

### **Examination**

Examination comprises three parts:

- 1) A written exam
- 2) Laboratory work presented in writing
3. A project presented in a written report and in an oral presentation

If students have a decision from Karlstad University entitling them to special pedagogical support due to a documented disability, the examiner has the right to give such students an adapted examination or to examine them in a different manner.

### **Grades**

One of the grades Great Distinction (5), Distinction (4), Pass (3) or Fail (U) is awarded in the examination of the course.

### **Quality Assurance**

Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course evaluation is partly based on student views and experiences obtained in accordance with current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

### **Course Certificate**

A course certificate will be provided upon request.

### **Additional information**

The local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.