Algorithms & Data structures

Timing: Spring semester 2019

Scope: 10 ECTS

Contents: The purpose of the module is to make the students able to explain and implement simple and complex data structures and to use algorithms to manipulate these. Further, equip students for designing their own algorithms to solve a given problem. Use of time and memory and scalability will be analysed.

Learning Objectives:

Knowledge -- The graduate will possess knowledge of:

- basic data structures such as stacks, queues, heaps
- binary trees, balanced trees, and hash tables
- basic sorting and searching algorithms
- basic graph theory

Skills -- The graduate will be able to:

- select and use a suitable data structure for a given task
- select and use suitable sorting, searching, and hashing routines
- select and use algorithms for graphs
- analyze algorithms for consumption of time, memory and scalability

Competencies -- The graduate will be able to:

- select, scale test, and use appropriate algorithms for practical problems
- devise, develop, scale test, and use algorithms for practical problems

Examination form: The exam is oral but with part of the exam as a written (pass/fail) test in the end of the course. For the oral part, the student will prepare a presentation (max. 5 mins) of the solution of one of the major hand-in assignments. Further examination/discussion (max. 15 minutes) will be based on the presentation but can include all aspects of the curriculum.

Assessment: One single grade is given according to the danish 7-point grading scale.

Admission criteria: The student must fulfil the mandatory learning activities. Written test must be passed.

Consequences of not passing the exam: Re-exam.