

Datalogi - Fagmodulkursus 4 - Essential Computing II

Om kurset

uddannelse	Fagmodul i Datalogi
Kurstype	fagmodulkursus
Undervisningssprog	English
	Register through STADS Self-Service
Tilmelding	Registration will take place during the period November - November 15, 2017
	The course description is preliminary
Kursus starter	16-02-2017
Kursus slutter	27-04-2017
Undervisningstidspunkt	Thursdays @ 8.15-12.00 during weeks 7-17 (no lecture on April 13 (week 15) due to Easter Holiday)
Undervisningssted	Kurset undervises i lokale 6.2-plenum
forudsætninger	Students should have knowledge of either an object-oriented or procedural language. Knowledge of basic programming language features, including primitive data types, operators, control structures, functions (methods), and input/output is assumed Students are expected to be able to read texts in English at a level at least equivalent to High School B-level Examples of how to structure your studies at Computer Science here
Kursusrækkefølge	It is recommended that the subject module course 1 'Essential Computing I' is followed before attending this course
formål	The purpose of this course is to provide a practical introduction to algorithms and data structures from the viewpoint of abstract thinking and problem solving. The primary focus is on problem-solving techniques that allow the construction of sophisticated time-efficient programs.
Indhold	The topics covered include data abstraction, generic components, algorithm analysis, recursion, algorithm design, searching, sorting, randomization, simulation, and graphs In more detail, the contents of the course may be described as follows:

- Data structures: Stacks, queues, linked lists, trees, hash tables, priority queues
- Algorithms: Analysis, verification, searching, sorting
- Problem solving techniques: Divide-and-conquer, dynamic programming, backtracking
- Programming: Object-oriented programming, thread programming, program testing
- Applications: Parsing, simulation, graphs

The object-oriented programming language Java is used in this course

Undervisningsform The course is a theoretical course with a combination of lectures and problem solving

The goal of the course is for the students to acquire:

Knowledge:

- Knowledge about theory and practice for fundamental algorithms and data structures
- Knowledge about algorithm and problem complexity
- Knowledge about program development from specification to testing

Skills:

- Skills to program in an object-oriented programming language by means of techniques for modularization and abstraction
- Skills to systematically test software

bedømmelseskriterier

Competencies:

- Competence to design and develop component-based software that is robust and scalable
- Competence to choose between different solutions and argue for the choice

To be more specific, on successful completion of the course, the student should be able to:

- Design, implement and test small to medium sized applications in an object-oriented programming language
- Understand and clearly explain the mechanics of algorithms and data structures involving manipulation of references, nested loops and recursion
- Choose among and make use of the most important algorithms and data structures in libraries

- Explain how fundamental algorithms for data structures for searching and sorting may be implemented
- Analyze time and space usage of algorithms and data structures
- Reason about the correctness of an algorithm
- Apply the following algorithmic techniques when solving a problem: Divide-and-conquer, dynamic programming, backtracking

15 minutes individual oral exam based on a written assignment. The assignment formulation is handed out at the start of the course and the assignment is handed in at course completion

Eksamensform

Examiners: Internal

Assessment: The 7-step marking scale

Same as ordinary exam

Written assignment:

Friday at 12.00, June 30 2017 at [Digital Eksamen](#)

Reksamensform

Oral exam:

August 24 (Thursday), 2017

You will be informed of details such as exact time and location later

Written assignment:

Friday at 12.00, May 5, 2017 at [Digital Eksamen](#)

Eksamenstidspunkt

Oral exam:

June 8 (Thursday) or June 9 (Friday), 2017

You will be informed of details such as exact time and location later

Aktivitetsansvarlig

Mads Rosendahl (madsr@ruc.dk)

Kursussekretær

IMT Studieadministration (imt-studieadministration@ruc.dk)

Underviser

Ebbe Vang (ebbevang@ruc.dk)

STADS fagmodulskursus

belastning : 5 ECTS

aktivitetskode : U25234

stamdata

prøveform : Skriftlig/mundtlig

bedømmelse : 7-trinsskala

censur : Intern censur