Linnæus University

Course syllabus

Faculty Board of Science and Engineering
School of Computer Science, Physics and Mathematics

1DV07U Programmering och datastrukturer, 7,5 högskolepoäng
Programming and Data Structures, 7.5 credits

Main field of study
Computer Science

Subject Group
Informatics/Computer and Systems Sciences

Level of classification
First Level

Progression
G1F

Date of Ratification
Approved by the Board of the School of Computer Science, Physics and Mathematics 2011-06-10

The course syllabus is valid from spring semester 2012

Prerequisites
Introductory course in Java 7.5 credits or equivalent.

Objectives

After the course the student should be able to:

- describe the object-oriented concepts inheritance and polymorphism
- model and develop systems using the object-oriented concepts inheritance and polymorphism
- describe what a design pattern is and why they are used
- describe the concepts algorithm and data structure
- describe and implement a few simple data structures like list, stack, queue, and binary tree
- describe how concepts like inheritance and polymorphism are supported by Java
- describe the most commonly used data structures in the Java Standard Library

Content

The following theoretical parts are treated:

- inheritance and polymorphism in object oriented programming
- object oriented modelling using inheritance
- introduction to algorithms and data structures
- simple search and sorting algorithms

- implementations of simple data structures like list, stack, queue, and binary tree
- introduction to design patterns
- the Iterator and Observer design patterns
- problem solving by recursion

The following parts in Java are treated:

- inheritance and polymorphism
- exceptions
- recursive method calls
- data structures in the Java Standard Library

Type of Instruction

Teaching consists of lectures and practical assignments. Practical assignments are individual or carried out in groups. The course can also be given as a distance learning course.

Examination

The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).
Assessment of student performance is made through written test and/or oral examinations and/or presentation of mandatory assignments.

Students who do not pass the regular examination will be offered retrials close to the regular examination.

On request, students may have their credits translated to ECTS-marks. Such a request must be sent to the examiner before the grading process starts.

Course Evaluation

A course evaluation will be carried out at the end of the course in accordance with the guidelines of the University. The result of the course evaluation will be filed at the department.

Required Reading and Additional Study Material

Required reading

Lewis, J & Loftus, W, *Java Software Solutions, Foundations of Program Design, 5th Ed., Addison-Wesley*, 2007 or later edition. Pages
260 (760).

DFM, *Distributed material*. Pages 100.