Linnæus University

Jnr: 2019/1706-3.1.2.2

Course syllabus

Faculty of Technology
Department of Computer Science and Media Technology

1DV507 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 2015-05-22
Revised 2019-05-11 by Faculty of Technology.
The course syllabus is valid from spring semester 2020

Prerequisites
This is a follow-up course that requires an introductory course in Java (7.5 credits).

Objectives
After the course the student should be able to:

- briefly describe the object-oriented software development process
- describe what a design pattern is and why they are used
- describe the concepts algorithm, data structure, and time complexity
- describe and implement a few simple data structures like list, stack, queue, hash table, binary tree, and binary heap
- describe different types of testing and be able to perform unit testing using JUnit
- describe the most commonly used data structures in the Java Standard Library
- describe the object-oriented concepts inheritance and polymorphism
- model and implement systems using the object-oriented concepts inheritance and polymorphism

Content
The following theoretical parts are treated:

- graphical user interfaces
- recursion
- introduction to algorithms and data structures
- simple search and sorting algorithms
- introduction to time complexity

- implementations of simple data structures like list, stack, queue, hash table, binary tree, and binary heap
- testing in general and unit testing in detail
- inheritance and polymorphism in object oriented programming
- object oriented modelling using inheritance

The following parts in Java are treated:

- exceptions
- recursive method calls
- data structures in the Java Standard Library
- JUnit testing
- interfaces, inheritance, and polymorphism
- generic classes

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 A, B, C, D, E, Fx or F.
The grade A constitutes the highest grade on the scale and the remaining grades follow in descending order where the grade E is the lowest grade on the scale that will result in a pass. The grade F means that the student's performance is assessed as fail (i.e. received the grade F).

Assessment of the students´s performance is made through written and/or oral examination or practical programming examination and/or presentation of mandatory assignments. The assessment method is decided at the start of the course.

Repeat examination is offered in accordance with Local regulations for courses and examination at the first and second-cycle level at Linnaeus University.

If the university has decided that a student is entitled to special pedagogical support due to a disability, the examiner has the right to give a customised exam or to have the student conduct the exam in an alternative way.

Course Evaluation
During the implementation of the course or in close conjunction with the course, a course evaluation is to be carried out. Results and analysis of the course evaluation are to be promptly presented as feedback to the students who have completed the course. Students who participate during the next course instance receive feedback at the start of the course. The course evaluation is to be carried out anonymously.

Credit Overlap
The course cannot be included in a degree along with the following courses of which the content fully, or partly, corresponds to the content of this course: 1DV007 Programming and Data Structures, 7.5 credits

Other
Grade criteria for the A–F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

Required Reading and Additional Study Material
Required reading
Introduction to Java Programming and Data Structures (Global Edition), Y. Daniel Liang, 11th edition, 2019. 400 (1000) sidor.

FTK, *Distributed material*. Pages 100.