Politecnico di Torino

Academic Year 2010/11 (first time established in A.Y.2007/08)

02LTKJA

Advanced programming

1st degree and Bachelor-level of the Bologna process in Electronic And Computer Engineering - Vercelli (III FACOLTA' DI INGEGNERIA)

Teacher	Status	SSD	Les	Ex	Lab	Years Stability
Prinetto Paolo Ernesto	PO	ING-INF/05	6	0	3	1

SSD	CFU	Activities	Area context
ING-INF/05	5	F - Altre (art. 10, comma 1, lettera f)	Altro
ING-INF/05	4	B - Caratterizzanti	Ingegneria informatica

Objectives of the course

The main goal of this course is to advance the students' programming skills and enable them to address and solve complex problem using advanced data structures and algorithms. The software design methodologies presented in the course will be applied to well known problems trade-offs between complexity and performances will be analyzed in detail.

Expected skills

Ability to solve a problem by designing a software program under performance, memory occupation, dimension, and reusability requirements.

Prerequisites

Basic knowledge of C programmino, arrays and lists.

Syllabus

- Project configuration
- Algorithms complexity analysis
- Recursive programming
- Sorting algorithms
- Advanced data structures:
o Stacks, FIFO, lists
o Trees
o Search Trees and BST
o Hash tables
o Graphs
- Search algorithms on complex data structures
- Algorithms on graph structures
o Minimum spanning trees
o TSP problem
o Coloring and Cliques
- Introduction to Genetic Algorithms

Laboratories and/or exercises

Solution of complex problems like Sudoku, T9, Cryptography, Optimization

Bibliography

Slides provided by the professor

Introduction to Algorithms. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein

Revisions / Exam

Two written exams, one covering the theory and one covering C programming.

Programma definitivo per l'A.A.2010/11

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