DN2258 Introduction to High Performance Computing 7.5 credits

Introduktion till högprestandaberäkningar

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for DN2258 valid from Autumn 2008

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Mathematics

Specific prerequisites

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

The goal of this course is to give the student a basic introduction to the skills needed to utilize high performance computing resources for own projects.

After the course you are able to

- analyze a given problem for possibilities of parallel computations
- select algorithms and hardware for the solution of high performance projects
- program computers with shared and distributed memory architectures
- use appropriate programming languages (including Fortran90) efficiently for scientific computations
- run parallel programs on different hardware architectures and software environments
- assess the performance of implementations
- optimize the performance.

Course contents

Computer architecture, structured programming for scientific computing, parallel algorithms, message passing, visualization, mass storage, GRID-computing.

An introduction to C++, Fortran90, and the hardware at Nada and PDC with Linux clusters and IBM SP2.

Course literature

To be announced at the web page for the course at least 2 weeks before the course starts. Previous year: K. Dowd, C. Severance: High Performance Computing.

Examination

- LAB1 - Laboratory Assignments, 3.0 credits, grading scale: P, F
- LAB2 - Project, 4.5 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Other requirements for final grade

Assignments (LAB1; 3 university credits).
Project (LAB2; 4,5 university credits).

Ethical approach

- All members of a group are responsible for the group's work.

- In any assessment, every student shall honestly disclose any help received and sources used.

- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.