IS2200 Parallel Computer Systems 7.5 credits

Parallella datorsystem

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 IS2200 valid from Autumn 2013

Grading scale

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

Education cycle

Second cycle

Main field of study

Specific prerequisites

Previous course in basic programming with threads and/or processes. E.g. ID1217 at KTH.

Language of instruction

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

Intended learning outcomes

The goals of this course is that the student should:

- understand and be competent in formulating problems for parallel execution,
- have knowledge about the principles of the design of modern parallel computer systems, and
- understand how the performance of a parallel computer is affected by:
  - the particular system architecture,
  - the partitioning of an application and the programming model

Course contents

- Structured parallel programming using parallel patterns and modern parallel programming frameworks
- Implementation of parallel programming frameworks
- Fundamental parallel computer architecture and their effect on performance. Cache coherence, implementation of synchronization primitives, memory models etc.
- Heterogeneous parallel architectures and programming models for heterogeneous systems (e.g. OpenCL/CUDA, accelerator programming)
- Performance models and tools. Race detectors, Parallel performance analyzers.

Disposition

Flipped classroom lectures. All lecture material is given on the web with quizzes to be done at home or in class followed by discussions on quiz results and problem oriented lecturing.

Course literature

Bestäms en månad före kursstart och annonseras på kursens hemsida. Målet är att all kurslitteratur ska vara tillgänglig på webben antingen från publika källor eller via KTH:s bibliotek.

To be determined at course web site one month before start of the course. The aim is to have all course literature available from open or KTH Library sources.

Equipment

Access to own computer (preferably x86-64 Linux) computer with KTH IP-number.

Examination

- PRO1 - Projedt, 3.0 credits, grading scale: A, B, C, D, E, FX, F

- TEN1 - Examination, 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.

Written exam 4,5 hp.
Hand-in assignment 3 hp.

Other requirements for final grade

Completed written exam and hand-in assignment.

The hand-in assignment may contain one or more of the following components:

- In-class participation
- Home-work assignments
- Programming project with written report
- Oral presentation
- Peer assessment

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.