



# DD2443 Parallel and Distributed Computing 7.5 credits

Parallella och distribuerade beräkningar

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

## Establishment

Course syllabus for DD2443 valid from Autumn 2019

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Computer Science and Engineering

## Specific prerequisites

Completed courses in discrete mathematics and algorithms and complexity equivalent to SF1688/SF1630 and DD2350/DD2352/DD1352.

## Language of instruction

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

## Intended learning outcomes

Having passed the course, the student should be able to:

- account for models, limitations and fundamental concepts within parallel computations with communication based both on message passing and shared memory
- analyse concrete systems and algorithms
- adapt and develop algorithms for execution on parallel and distributed machines and analyse the algorithms with respect to correctness, reliability, safety and performance.

## Course contents

The course is an advanced course in parallel and distributed computations, dealing with the following subjects:

- models, fundamental concepts and analytical methods for parallel and distributed systems, fundamental limitations and impossibility results,
- algorithms and protocol for commonly occurring computational problems within communication, synchronisation, fault tolerance, coordination and consensus, replication and sharing, security, and peer-to-peer systems,
- basic knowledge of synchronization mechanisms within operating systems and programming languages (semaphores, locks, monitors) and some interest for theoretical subjects are good starting points.

## Course literature

M. Herlihy, N. Shavit: The art of multiprocessor programming, revised reprint 2012.

## Examination

- UPP1 - Seminars, assignments and labs, 3.0 credits, grading scale: P, F
- TEN2 - Oral exam, 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.

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

The examiner will decide, in consultation with KTH's coordinator for disabilities, how to adapt an examination for students with a documented disability. The examiner may utilize another examination format when re-examining individual students.

## 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.