

# COURSE DETAIL

## PARALLEL AND DISTRIBUTED ALGORITHMS

**Country**

Singapore

**Host Institution**

National University of Singapore

**Program(s)**

National University of Singapore

**UCEAP Course Level**

Upper Division

**UCEAP Subject Area(s)**

Computer Science

**UCEAP Course Number**

148

**UCEAP Course Suffix****UCEAP Official Title**

PARALLEL AND DISTRIBUTED ALGORITHMS

**UCEAP Transcript Title**

COMPUTNG ALGORITHMS

**UCEAP Quarter Units**

6.00

**UCEAP Semester Units**

4.00

## Course Description

This course examines fundamental issues in parallel computing (i.e., shared-memory algorithms) and distributed computing (i.e., message passing algorithms), and the relationships between the two. It covers various classic problems in parallel/distributed computing, how to design algorithms to solve these problems, and how to prove the correctness of the algorithms. It also looks at various impossibility results in parallel/distributed computing, as well as how to develop impossibility proofs for simple problems. The topics include mutual exclusion, semaphores, consistency, wait-free synchronization, logical time, global state, consistent snapshots, message ordering, consensus, fault-tolerance, transactions, and self-stabilization. This is a pure algorithm/theory module and does not involve explicit programming (to avoid overlapping with CS3211, which focuses on programming). However, the students need to construct proofs based on code, and also potentially write code (on paper) to specify protocols.

## Language(s) of Instruction

English

## Host Institution Course Number

CS4231

## Host Institution Course Title

PARALLEL AND DISTRIBUTED ALGORITHMS

## Host Institution Campus

## Host Institution Faculty

## Host Institution Degree

## Host Institution Department

Computer Science

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