Course program and reading list

Semester 2 Year 2022

School: Efi Arazi School of Computer Science M.Sc.

Distributed Algorithms

Lecturer:

Prof. Gadi Taubenfeld  tgadi@idc.ac.il

Teaching Assistant:

Prof. Gadi Taubenfeld  tgadi@idc.ac.il

Course No.: 3510  Course Type: Elective  Weekly Hours: 3  Credit: 3

Course Requirements: Final Paper

Group Code: 222351000  Language: Hebrew

Prerequisites

Prerequisite:

52 - Calculus I
53 - Calculus II
54 - Linear Algebra I
55 - Linear Algebra II
56 - Discrete Mathematics
59 - Data Structures
69 - Logic And Set Theory
77 - Algorithms
84 - Operating Systems
417 - Introduction To Computer Science
Course Description

Content: The course deals with the design and analysis of distributed algorithms focusing on issues such as algorithms, models (shared memory and message passing), upper and lower bounds, proof methods, and impossibility results. Possible topics covered include: synchronization and coordination problems such as mutual exclusion; concurrent data structures; decision problems such as consensus, leader election and renaming; distributed graph algorithm such as minimum weight spanning trees; detection algorithms such as deadlock detection and global snapshots. We will also prove that certain problems cannot be solved in an unreliable distributed environment where multiple processes may fail.

Course Goals

Learn to design, analyze and prove the correctness of distributed algorithms.

Grading

<table>
<thead>
<tr>
<th>Coursework</th>
<th>Timing</th>
<th>% of grade</th>
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<tbody>
<tr>
<td>Three exercises</td>
<td>- every 3 weeks</td>
<td>60% (20% each)</td>
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<tr>
<td>Final work (צומת מ.scan)</td>
<td>end of the semester</td>
<td>40%</td>
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Learning Outcomes

Learn to design, analyze and prove the correctness of distributed algorithms.

Lecturer Office Hours

Sunday 17:00.

Additional Notes

Additional info: There are no programming assignments.
Reading List

**Course Materials:** The course material is drawn from recent research papers and from the following textbooks:

**Textbooks:**
