



DISTRIBUTED SYSTEMS

Course material and examination

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Lecture content

- Lecture 1 – Introduction to distributed systems
 - Summary: fundamental concepts and definitions of distributed systems
- Lecture 2 - System architectures
 - Summary: Definition of system architecture, components and types
- Lecture 3 – Processes
 - Summary: Completion of tasks in distributed systems
- Lecture 4 – Communications
 - Summary: Interaction between processes, task scheduling and cooperation between processes.
- Lecture 5 – Naming
 - Summary: Identification of processes within a system.

Lecture content

- Lecture 6 - Coordination (Part I)
 - Summary: The importance of coordination in distributed systems
- Lecture 7 - Coordination (Part II)
 - Summary: Mutual exclusion and coordination primitives
- Lecture 8 - Coordination (Part III)
 - Summary: Mechanisms to avoid starvation and deadlock
- Lecture 9 - Consistency and replication
 - Summary: Data models for consistency and data management
- Lecture 10 - Fault tolerance
 - Summary: Preventing system breakdowns and disaster management

Lecture content

- Lecture 11 - Edge computing
 - Summary: a new old principle in distributed systems
- Lecture 12 - Cryptocurrencies and distributed ledgers
 - Summary: Security and rigorous consistency in distributed systems
- Lecture 13 - Distributed systems research
 - Summary: Open problems in distributed systems, opportunities and beyond

Lecture content

- Material sources to review
 - Lectures 1, 2, 3, 4, 5, 9 and 10
 - **Van Steen, Maarten , Tanenbaum, Andrew.** Distributed Systems: Principles and Paradigms (Third edition). Published by Maarten van Steen, 2017. [Previous versions published by Pearson]
Free download from <https://www.distributed-systems.net/>
 - Lectures 6, 7 and 8
 - **Ghosh, Sukumar.** Distributed systems: an algorithmic approach (second edition). Chapman&Hall/CRC, 2015. Author's own course material, Spring 2015:
<http://homepage.divms.uiowa.edu/~ghosh/16615.html>

Lecture content

- Material sources to review
 - Lectures 11, 12 and 13
 - Research material and scientific articles on the topic
- Additional information
 - Book chapters to consult for each lecture are listed at the end of each lecture slide.
 - Scientific readings are listed at the end of each lecture slide. These readings are also part of the content of the course.

Lecture content

- Lectures slides available publicly to download
 - <http://huberflores.com/courses/Course-material-DS2018.zip>

Examination

- The examination of the course is oriented to evaluate gained skills during the course regarding
 - Basic concepts
 - e.g., what is difference between stateless and stateful architectures
 - System modelling
 - e.g., modelling deadlock using petri nets

Further questions

- Please send your questions to
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THANKS FOR YOUR INTEREST

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