

# IN5020/9020 Distributed Systems

## Course Overview

### Lecturers:

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August 21, 2023

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## Lectures and exercises

- Lectures
  - Monday 10:15 -12:00, KN, Lille auditorium
  - First time: August 21st
- Group sessions
  - Friday 10:15 - 12:00, OJD, IT-seminarrom Sed
  - First time: September 1st

## Learning Goals

- Provide a basic understanding of
  - fundamental **principles, concepts** and **state-of-the-art**
  - **key technologies** for realising distributed interactive systems of the future
- Gain **practical experience** with representative platforms to realise distributed applications
- Provide knowledge about **today's challenges** in various topics in distributed systems, including
  - Multimedia
  - Ubiquitous and mobile computing
  - Cloud computing

## As a basis for other master courses and your job career

- This course as a foundation for more advanced courses at IFI, e.g.
  - IN5420 – Distributed Blockchain Technologies
  - IN5700 – Fog and Cloud Computing
  - IN5060 – Quantitative Performance Analysis
- For some course topics: 'implicit' use in today's development technologies
  - help for better understanding of a technology and how to use it efficiently
  - especially when addressing quality of service, correctness of functional features, resource-aware design, etc.
    - e.g. In large-scale Internet of Things (IoT) systems: message passing?

## Course Elements

- 13 lectures (including the summary)
- About 12 group meetings
  - Introduction to mandatory programming exercises
  - Mandatory programming exercises (3 small projects)
  - Theoretical exercises (group work & discussions)
- Detailed teaching plans and copy of the slides are made available on the web
  - NOTE: only the IN5020 pages will be maintained (not IN9020)

## Exam and Grading

- Oral exam constitutes 100% of the grade
  - Examinable material is based on the lectures (corresponding to the textbooks), theoretical exercises, programming assignments
- Submission of all programming assignments (complete and working) is a prerequisite
  - Tested but not graded

## Syllabus

- Taken from
  - G. Coulouris, J. Dollimore, T. Kindberg, G. S. Blair “Distributed Systems – Concepts and Design”, fifth edition, Addison-Wesley
  - A. Tanenbaum, M. van Steen, “Distributed Systems – Principles and Paradigms”, 2nd edition, Prentice-Hall, downloadable from <https://www.distributed-systems.net/index.php/books/distributed-systems/>
  - Minor additions from the 3rd edition of A. Tanenbaum, M. van Steen, downloadable from <https://www.distributed-systems.net/index.php/books/distributed-systems/ds3-eBook/>
  - A number of additional papers for PhD students
- The syllabus is specified on the lecture schedule webpage for each lecture topic

## Topics

- Introductory lecture (overview)
- System models
- Distributed objects and object-based middleware
- Web Services
- Component-based distributed systems
- Communication paradigms
- Time and coordination
- Paxos and distributed transactions
- Replication
- Peer-to-peer systems
- Mobile and ubiquitous computing
- Distributed multimedia systems
- Cloud, IoT, etc.

**See also plenary sessions schedule on course web**