IN5040/9040 - H2025
Advanced Database Systems for Big Data

Vera Goebel

Thomas Plagemann

Fall 2025

Course Purpose

- The course gives an overview of new developments within data management technology
  - Emphasis on usage and applicability
  - Concepts and design, <u>not</u> so much about concrete systems

Organization of the Course

- Course mode:
  - Lectures: Wednesday, 3 hours, 12:15-15:00, Lille Aud. (old Ifi)
  - 10 weeks lecturing
  - Mandatory exercise (2 parts)
- Information & lecturing material:

  https://www.uio.no/studier/emner/matnat/ifi/IN5040/h25/index.html
- PhD students (IN9040):
  mandatory 45 min. Presentation
- Examination:
  - Oral (dates and modalities to be announced later)

Syllabus (Pensum)

- All slides and handouts
- Selected articles (on the Web page)
- Hueske, F., Kalavri, V.: Stream Processing with Apache Flink, O´Reilly, 2019

DBS basic knowledge & selected chapters for IN5040:

- Elmasri & Navathe: Fundamentals of Database Systems, 5th or 6th edition, Addison-Wesley
- Garcia-Molina, Ullman & Widom: Database Systems – The Complete Book, 2nd edition, Prentice Hall, 2009

Mandatory Exercise

- **Organization:** 2 parts = 2 deliveries each student works alone

- **Delivery date:** Hard Deadlines!
  Part 1: September 24, 2025, 23:59h
  Part 2: October 16, 2025, 23:59h

- Only students that have passed the mandatory exercise (both parts!) are allowed to take the examination!

Content Overview

- Data Stream Processing (Part 1)
- Data Stream Processing (Part 2)
- Distributed Database Systems
- Heterogeneous Multi-Database Systems
- Web & XML Data Management
- Knowledge Discovery & Data Warehouses
- Machine Learning in Medicine *
- Scalable & Cloud Data Management
- Performance Analysis & Large DBS *

*Guest Lectures