DNA Welcome & Introduction

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Presentation of the Course

- Computer architecture
  - digital circuits
  - processor architecture
  - processor instruction sets
- Network architecture
  - protocol layers
    - physical
    - data link
    - transport
    - applicatoin

Course Books

- *Essential of Computer Architecture – Douglas E. Comer*
- *Computer Networking – A Top-Down Approach – James F. Kurose & Keith W. Ross*
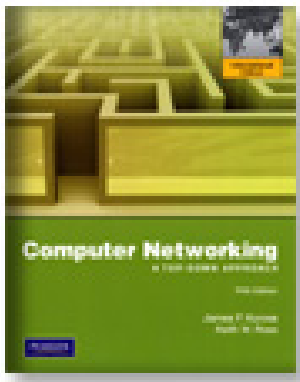
- Connected to MVP and PSS so we'll share course materials.

Course

- 5 lectures on computer architecture.
- 10 lectures on network architecture.
- 2 lecturers (Arne Skou & me).
- Lectures in 3x30 min.
- Marked oral exam.

Goal

- Understand how computers work.
  - Processors are everywhere.
  - Important to understand how they work to use them properly.
    - Write smaller, faster, correct programs.
    - Understand consequences of programming choices.

Digital Hardware

- Real stuff is **very** complex
  - complex timing issues
  - signal propagation – noise
  - soon billion(s) of transistors
  - optimized circuitry
- But we don't need to know all low-level details
  - characteristics of major components
  - overall system view
  - consequences for programmers
  - consequences for (hardware) system

Computer Architecture

- Basics
  - digital circuits – limits for hardware
  - data representation – limits for software
- Processors
  - types of processors
  - instruction sets and operands
  - assembly and programming
    - compilers bridge the gap between high level languages and assembly – connection to SPO
- Memory
  - basics on VM
  - caches – understanding performance