NTNU | Norwegian University of Science and Technology

Operating Systems

Welcome and Q&A Session 1 – 17.01.2022

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The lecture mode for this semester

- Flipped classroom (or “inverted classroom”) – what’s that?
  - Idea: Enable students to “attend" lectures whenever they have time
  - Usually, the lecture times are instead replaced by group work sessions
    - That’s a bit difficult to do online…
  - Weekly sessions (Mon 12:15-13:00) on zoom
    - Discussion of general Q&A on contents, logistics etc.
    - Discussion of solutions to exercises handed in
    - Hints for and overview of new exercises for the week

Course information

- Main source of information on the web: http://folk.ntnu.no/michaeng/tdt4186_22/
  - Syllabus, lecture slides, exercise sheets, video links, …
- Youtube lecture videos
  - Linked from web page
- Blackboard course
  - Submission of exercises
  - Announcements
- Discussion forum
  - Will be announced later this week (piazza or alternative)

Exercises / Assessments

- Theoretical exercises: ***recommended***
  - Five to six theoretical exercise sheets
  - Corrected and commented on, but not part of the grade
- Practical exercises: ***mandatory***
  - **Three** practical exercises
  - Subsequent exercises are based on earlier ones
  - Practical exercises make up 50% of the overall grade
  - Each practical exercise is worth 1/3th (33.3%) of this
- Submit solutions ***in groups*** (2 or preferably 3 students)
  - Find group partners in spreadsheet, enter in Blackboard sharepoint link
- Submission dates of theoretical and practical exercises *overlap!* Theoretical exercises serve as preparation for the practical part

Overview of practical exercises

- **Practical exercises**
  - Three exercises this semester – three weeks time to submit
  - We are going to explore Unix/Linux from the system call interface
    - System calls, process management, synchronization, memory, …
  - **Plagiarism is not accepted and will be penalised!**

Week	Publication	Submission	Topic (may still change)
5	31.1.2022	21.2.2022	System calls & processes
8	21.2.2022	14.3.2022	Synchronization
11	14.3.2022	4.4.2022	Memory

Grading

- Letter-based grading
- Two parts:
  - Practical exercises (50%)
  - Home exam (50%)

- The exam will be based on the lecture contents, theoretical and practical exercises
  - We will publish an example exam with typical questions
  - In addition, we will publish a sample solution for self assessment
  - Of course, we will also have a Q&A session for this

Teaching assistants

- Espen Haugsdal
  https://www.ntnu.edu/employees/esh

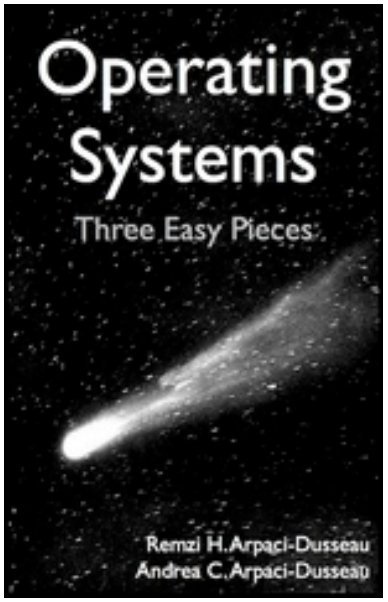
- Three student læringsassistenter (to be confirmed)

Semester overview

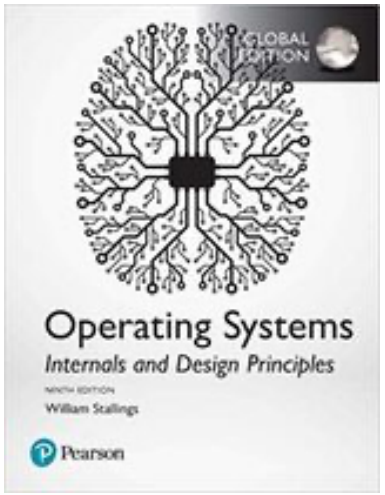
- Review of relevant computer architecture concepts
- Challenges and tasks of operating systems
- Control flow abstractions: processes and threads
- Concurrency: mutual exclusion, synchronisation, deadlocks
- Memory management and virtual memory
- Scheduling: uni- and multiprocessor, realtime
- I/O management and disk scheduling
- File management
- Virtual machines and microkernels
- The Cloud, Unikernels and single-address space OS's
- Embedded systems and non-functional properties
- Operating system security

Literature

Authors	Remzi H. Arpaci-Dusseau and Andrea C. Arpaci-Dusseau
Title	Operating Systems: Three Easy Pieces
Available	Free PDF download: http://pages.cs.wisc.edu/~remzi/OSTEP/



Author	William Stallings
Title	Operating Systems - Internals and Design Principles, 9th Global Edition
ISBN	9781292214290



+ additional papers, articles, … on my web page: http://folk.ntnu.no/michaeng/tdt4186_22/