



Operating Systems Overview

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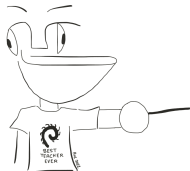


Where Do You Find Operating Systems?



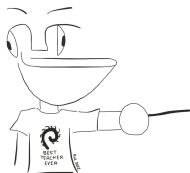
Objectives

- Be able to design/understand the **software architecture** of real-time embedded systems, with a focus on smart objects



Fundamental aspects of (Real-Time) Operating Systems

- Be able to **program real-time applications** for smart objects
 - Logical behaviour
 - Real-time behaviour



Functionalities offered by (Real-Time) Operating System, using APIs and drivers

General Organization

Operating Systems (OS)

- Theoretical courses: ~10h
- Lab sessions: ~14h

Project

- Programming real-time applications

Grading

- Labs: 10%
- Project: 30%
- Exam: 60%

Real-Time Operating Systems (RTOS)

- Theoretical courses: ~3h
- Lab sessions: ~8h



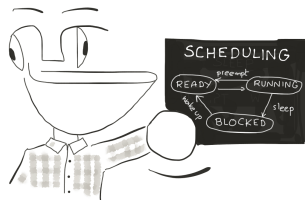
How Can You Organize Your Time?

ECTS

- 1 ECTS = \sim 25 hours of work
- if you pass the exam, you get 5 ECTS
- 42 hours of lecture and labs
- Personal work represents the other fraction ...

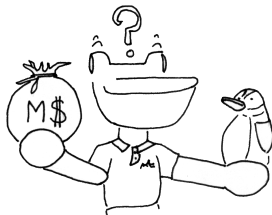
Suggested work

- Practice of C language
- Projects (\sim 30h)
- Finishing labs (\sim 10h)
- Preparing the exam (\sim 10h)



Lectures

- Introduction
- Processes
- Scheduling
- Memory management
- I/O systems
- Threads
- Communication and synchronization techniques



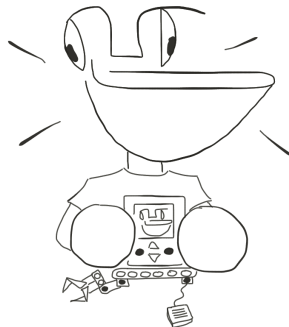
Labs

- System calls, spawning processes and kernel tracing, scheduling, Android system, Linux kernel

Real-Time Operating Systems: Outline

Lectures

- Basic concepts
- An introduction to POSIX and RTAI/Xenomai
 - RTAI / Xenomai = Real-time versions of Linux



Labs

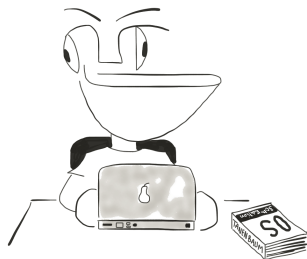
- POSIX

Project: To be defined

- Programming with real-time constraints

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- Slides
- Sessions with (old) videos and exercises
- Project
- Former exams and solutions
- Links to other interesting websites
- Recommended books (see next slide)



References: Books

- Operating systems, Tanenbaum, ISBN 0-13-638677-6
- Modern Operating Systems, Tanenbaum, ISBN 0-13-031358-0
- Applied operating System Concepts, Silberschatz, ISBN 0-471-36508-4
- Many others recommended books and links on the web site!



Questions?

