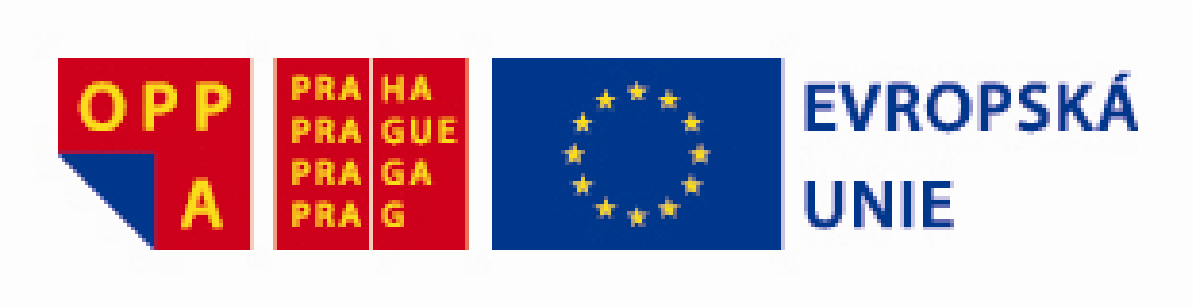
Inovace tohoto kurzu byla v roce 2011/12 podpořena projektem CZ.2.17/3.1.00/33274 financovaným Evropským sociálním fondem a Magistrátem hl. m. Prahy.



Evropský sociální fond
Praha & EU: Investujeme do vaší budoucnosti

Department of Distributed and Dependable Systems D3S

Embedded and Real-time Systems

Introduction

http://d3s.mff.cuni.cz

Tomáš Bureš

<bures@d3s.mff.cuni.cz>

CHARLES UNIVERSITY IN PRAGUE

Faculty of Mathematics and Physics

Requirements for Getting Credit

- Term project – max. 60 points
  - Report: design and analysis of real-time properties
  - Implementation
- You have to be registered in for the labs in the Student Information System

Exam and Final Grade

- Written test
  - Given at the last lecture
  - 40 points max.
- The final grade
  - Determined by the sum of points from exam test and term project
  - 80 and more: excellent
  - 72 – 79: very good
  - 63 – 71: good
  - less than 63: next time...

Expected Knowledge

- Operating Systems
  - Basics of processes, threads, scheduling and synchronization
- C-language and low-level programming
  - If you passed the Operating Systems labs, you should not have any problems.
- English

Sylabus

- Introduction – what are real-time systems, what are embedded systems
- Scheduling
- Synchronisation – priority inversion and its avoidance
- Offline scheduling
- Design
- Real-time operating systems
- Real-time communication
- Soft real-time
- Optional
  - Multi-core scheduling
  - Real-time Java

Literature and Links

- Lecture slides can be downloaded from the course website
  - login: ers
  - password: kala
  - http://d3s.mff.cuni.cz/teaching/embedded_realtime_systems/

- Giorgio C. Buttazzo: Hard Real-Time Computing Systems, Kluwer AP, ISBN: 0-7923-9994-3
- Liu, C. L.; Layland, J. (1973), "Scheduling algorithms for multiprogramming in a hard real-time environment", Journal of the ACM 20 (1): 46–61, doi:10.1145/321738.321743

Acknowledgement

- The lecture and slides are originally based on:
  - Real-time systems, basic course
    - Damir Isovic, Mälardalen University, Sweden
    - http://www.idt.mdh.se/kurser/cdt315

Innovation to the course in 2011/12 is partially supported by the project CZ.2.17/3.1.00/33274 financed by the European Social Fund and Municipal House of Prague.

Prague & EU: We invest invest into your future!

Cooperation Possibilities

- Topics:
  - IoT, Smart Cyber-physical Systems
  - Modelling, Component and service-oriented architecture
  - Performance engineering
  - Operating systems
  - Formal system analysis, verification
- Cooperation frame – D3S Student's lab
  - Master theses (possible to start even now)
  - Software project
  - Scientific project work and short-term paid projects
  - PhD study (necessary to apply till the end of April!)
- Contact: http://d3s.mff.cuni.cz/

Department of Distributed and Dependable Systems D3S