

Einführung in eingebettete Systeme

Content

Basic introduction to technologies, functions and design of embedded systems: Typical requirements, examples of product and production automation, introduction to microcontrollers, introduction to logic control with PLCs, device technology, and according tools.

News

Date	News
03/14/2007	Grades are online. The inspection (Klausureinsicht) will be on wednesday march 21st, 1 pm in the room 2323 (exercise room).
01/30/2007	Added hardware platform selection lecture.
01/23/2007	Added FPGAs in a nutshell lecture.
01/17/2007	Major update on lecture material.
01/09/2007	Exercise 5 added.
12/13/2006	Exercise 4 added.
11/29/2006	Exercise 3 added.
11/28/2006	Added literature links.
11/21/2006	Added exercise sheets.
11/06/2006	There will be no lecture tomorrow, Tuesday 7th, because of the „Fachschaftsvollversammlung“.
10/24/2006	Preliminary group assignment is finished. English group starts on October 24., German group starts on November 8th.
10/16/2006	As there will be no lecture this tuesday (17.10.), there will be no exercise this wednesday (18.10.) either. Btw: the exercise starts a little earlier (90 + 15 min.) as the time for setting up the microcontrollers has been added.

Links

- [Forum](#)
- [Campus](#)
- [Frequently asked questions MCU](#)
- [ATmega16 Description](#)
- [All FAQs including FPGA and VHDL issues](#)

Lecture Material

Date	Topic	Documents
2006-10-31	Organisation	Slides
2006-10-31	Introduction	Slides

2007-01-17 Microcontroller 1	Slides
2007-01-17 Microcontroller 2	Slides
2007-01-10 ADC/DAC (continued)	Slides
2006-01-17 Microcontroller 3	Slides
2006-01-17 Introduction to logic control	Slides
2006-01-17 PLCs 1	Slides
2006-01-17 PLCs 2	Slides
2006-01-17 Function Block Diagrams 1	Slides
2007-01-10 Function Block Diagrams 2	Slides
2006-01-17 Instruction List	Slides
2006-01-17 Specification and Implementation	Slides
2006-01-23 FPGAs in a nutshell	Slides
2007-01-09 Hardware Platform Selection	Slides

Exercise Material

Date	Topic	Documents
2007-01-09 PLC 2		Template file: acid dilution
2006-12-13 PLC 1		Template File: Gas Burner
2006-11-29 ADC Programming		lcd.h
2006-11-29 ADC Programming		lcd.c
2006-11-29 ADC		Exercise 3
2006-11-15 Timers		Exercise 2
2006-11-15 Interrupts		Exercise 2
2006-11-08 General MCU Introduction		Exercise 1

Exercises

Date	Topic	Documents
2007-01-09 PLC 2		Exercise 5
2006-12-13 PLC 1		Exercise 4
2006-11-29 ADC Programming		Exercise 3
2006-11-21 General introduction to ATmega16		Exercise 1
2006-11-21 Interrupts and Timers		Exercise 2

Conditions for getting a certificate (Übungsschein)

Participation in the exercises on a regular basis followed by an exam at the end of the semester. During the first half of the exercises, students will work with the ATMEL [ATmega16](#) AVR microcontroller (8bit RISC). In the second half, students will learn about PLCs (Programmable Logic Controllers).

Microcontroller Part

- The software we are using is Freeware. Since the Atmel Studio also offers a simulator (running in simulator mode as soon as no device is connected) you can experiment with it at home.
- You need [WINAVR](#) and the [AVR studio 4](#). A local copy of the WIN AVR Studio used in the lab course can be found [here](#).
- Slides with a detailed step by step description of the design flow using WINAVR along with the AVR Studio can be found [here](#) (501kB).
- A short overview can be found [here](#) (10kB).
- More information can be found on [atmel.com](#) and in the according sections of Falk Salewski's Link List.

Programmable Logic Controller (PLC) Part

- [CoDeSys](#): Softwaretool for programming & simulating PLC software

Exercise Schedule