Microcontroller Programming

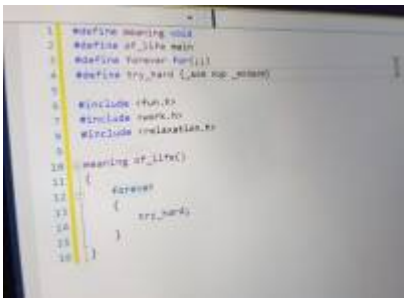
Student Group

First Name	Surname	Matrikel Nr.

Table of Contents

Microcontroller Technology

Introduction and Context



Source: own photo (CC0 1.0)

Microcontroller technology deals with how to bring a programmable component (“microcontroller”) to life. In the following, the software is programmed in the C programming language. In contrast to the language components and algorithms presented in the Computer Science course in the 1st and 2nd semester, the focus here is on the special characteristics resulting from the close connection to hardware. The course builds on knowledge from the following subjects:

- Computer Science I and II

Important:

- Stay in contact with us! Even though there may be weeks of independent work, communication is important so that a meaningful result can be submitted for the respective deadlines.
- Exchange ideas with the other students. In most cases, you have the solution to someone else's problem, and vice versa.
- If you only start programming one week before the submission deadline, things will usually get tight. Especially if there are uncertainties and questions. Start early.
- Try to find enjoyment in programming. It is like doing a puzzle, except that you decide what the picture looks like!

Links to the Lecture

Topic	Description	Language
Tutorial	A good introduction to embedded software development can be found in the book “Sensor Networks in Theory and Practice - Successfully Realizing Embedded Systems Projects” by Prof. Meroth and Mr. Sora. It explains how to get started in the field of software development embedded in hardware. From within the university network or via VPN, you can access it directly on Springer Link.	German
	The above-mentioned book is also available in English as “Sensor Networks in Theory and Practice”. It is the accompanying book by Prof. Meroth and Mr. Sora. It explains how to get started in the field of embedded software development for hardware systems. From the university network or via VPN, you can access it directly on Springer Link.	English
Tutorial	Recommended tutorial from mikrocontroller.net	German

Topic	Description	Language
Tutorial	The AVR itself also provides a good introduction to C programming on the AVR platform as a video and as textual Developer Help	English
Datasheet	The data sheet of the ATmega88 is also a good reference work	English
Datasheet	The data sheet of the ATmega88 has also been translated into German: Online data sheet ATmega88	English
C Support	A calculator for interrupt timers and prescalers	English
C Support	Documentation of the AVR compiler libraries (e.g. stdlib)	English

Further Links

C Programming

- Nice online open source book for learning the C programming language
- C Code Reference Card ("C cheatsheet")

Embedded Systems Engineering and Hardware/Software Co-Design

- Embedded Systems Engineering Handbook from TU Clausthal / FH Nordhausen: very detailed and in-depth book
- The book Practical UML Statecharts in C/C++, 2nd Edition: Event-Driven Programming for Embedded Systems is also suitable as a detailed reference work
  Chinese translation

Miscellaneous

- Table of ASCII characters
- Assembly instructions for the Mexle AVR programmer