

Modul – No.	782	Mandatory	
Module name	Embedded Software Design and Programming		
Module coordinator	Prof. Dr. Dotsenko		
Title	Embedded Software Design and Programming		
Title of examination	Embedded Software Design and Programming		
Semester	1		
Course Type	Language	Lecture including exercises	English
SWS/ ECTS/ Workload	2/2/0	5	150
Requirements for attendance	None		

1. Content and objectives

Content:

The module outlines the challenges of embedded software development and describes the common elements of embedded solutions.

- Quality criteria for embedded software
- Embedded operating systems
- Memory management
- Managing sensors and actuators, technique for communicating with the peripherals
- Task management and scheduling
- Using network interfaces
- Minimizing power consumption
- Test strategies

Objectives:

On successfully completing the module the students will be able

- To contrast the differences between embedded and conventional software requirements and architectures
- To know the architecture of the relevant operating systems including memory management
- To understand the steps involved in controlling physical devices and using networking capabilities
- To implement parallel processes with synchronization
- To develop a test plan for embedded solutions

Recommended Literature:

- Marwedel, P., Embedded System Design: Embedded Systems Foundations of Cyber-Physical Systems, and the Internet of Things. 3rd Ed, 2018, Springer
- White, E., Making Embedded Systems, 2011: O'Reilly Media

2. Methods of instructions

Lecture with integrated exercises

3. Requirements for attendance

Prerequisites: Working knowledge of C++ or Java

4. Usability of this module

The module is offered as mandatory course in the master study course „Computer Engineering for IoT Systems“ as well as elective course in other master courses of the Engineering Department.

5. Requirements for assessment

Assessment is performed either as written examination (90 minutes) or oral examination. Students need to pass the module examination, which encompasses all contents of the lecture.

6. ECTS credits

5 ECTS credits

7. Frequency of offer

Every summer term

8. Work load

150 h of total work load, from:

- 45 h of presence at lectures/exercises
- 55 h of self-study
- 50 h of preparation for examination

9. Duration of module

1 semester
