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| **Óbuda University**<br>Kandó Kálmán Faculty of Electrical Engineering | | | Department of Instrumentation ans Automation | |
| **Subject name and code:** Real-time operating systems, **KMVRO1ABNE Credits: 4** | | | | |
| **Specializations:** All free.chice subject | | | | |
| **Subject leader:** | Dr. Schuster György | Teachers : | Dr. Schuster György | |
| **Prerequisites:** none | | | | |
| **Lectures:** | **Theory: 2** | **Seminar.: 0** | **Lab. Exec.: 0** | **Consultations: 0** |
| demands : | Semester mark | | | |

**Education material**

*Aim of education*: Students will learn about the features of real-time operating systems and their application in a variety of environments. Learn how to implement an operating system on microcontrollers.

| **Topics:** | **Week:** | |
|---|---|---|
| Real-time basic concepts. Hard and soft real-time features. General structure of RT operating systems. Scheduling. | **1.** | |
| Comparison of "traditional" and RT operating systems. Examples. | **2.** | |
| IPC solutions for operating systems. Multi tasking requirements. | **3.** | |
| Resource protection MUTEX and semaphore. Dead lock cases and their release. | **4.** | |
| Choice between native programming and operating system. | **5.** | |
| FreeRTOS basic concepts, availability, scope of use. | **6.** | |
| Implementing FreeRTOS on an 32-bit microcontroller. | **7.** | |
| Task definition and boot on FreeRTOS on an 32-bit device. | **8.** | |
| OSEK RTOS features. | **9.** | |
| OSEK implementation. | **10.** | |
| OSEK hooks. | **11.** | |
| QNX features | **12.** | |
| Native solution and RTOS solution. | **13.** | |
| Test work | **14.** | |

**Demand of the semester**

The semester ends with a mid-year ticket. At the end of the semester, students write an 20-question electronic test. The test questions contain 3 answers, one of which is correct. A condition for a sufficient grade is the correct answer to 4 questions. The scores increase in direct proportion to the increase in the score.

**Literature:**

Obligatory: Materials issued by the instructor
Recommended: http://embeddedcookbook.com/parts/FREERTOS/docs/