Obuda University John von Neumann Faculty of Informatics			Institute of Cyber-physical systems	
Name and code: High availability embedded systems / NIXMI1EMNE **Credits*: 4*** *2022/23 year I. semester*				
Subject lecturers: Zsolt Bringye				
Prerequisites (with code):	Test			
Weekly hours:	Lecture: 1	Seminar.: 0	Lab. hours: 2	Consultation: 0
Way of assessment:				
Course description:				
Goal: The aim of the lecture is to familiarize students with the basics of High Availability Embedded Systems.				
Course description: During the course, the student will get knowledge about the theoretical and practical problems of highly reliable embedded systems and the possible solutions to these problems. Hardware and software redundancy is highlighted field in this course. In the lab sessions, the students will develop Arduino-based PoC codes (using Tinkercad) to deepen their knowledge of the subject. In the second part of the semester, the students will develop a relatively complex embedded system with HA requirements and use the learned methods to satisfy these requirements.				

Lecture schedule	
Education week	*Topic*
1.	Lecture (3 hours): General introduction to the topic (high availability in general, specialties of embedded systems)
2.	Lab (3 hours): Introduction to Tinkercad Circuits and most important components (creating simple test programs)
3.	Lab (3 hours): Tinkercad Circuit Blocks vs Text-based programming, debug possibilities (creating simple test programs)
4.	Lecture (3 hours): Error Detection
5.	Lab (3 hours): Error detection examples
6.	Lab (3 hours): A complex example with HA requirements
7.	Lecture (3 hours): Error Handling
8.	Lab (3 hours): A complex example with HA requirements (contd.)
9.	Lab (3 hours): A complex example with HA requirements (contd.)
10.	Lecture (3 hours): Protecting from Errors
11.	Lab (3 hours): A complex example with HA requirements (contd.)
12.	Test
Midterm requirements	
Written test (theoretical) and a simple PoC program which solves a given HA related problem	

Final grade calculation methods

Achieved result	Grade
86%-100%	excellent (5)
74%-85<%	good (4)
62%-73<%	average (3)
50%-61<%	satisfactory (2)
0%-49<%	failed (1)

Type of exam

n.a.

Type of replacement

References

Mandatory:
Lecture notes (download form https://elearning.uni-obuda.hu/)

Recommended: Embedded Software Development for Safety-Critical Systems, Second Edition by Chris Hobbs (Author)