Cyber Security

Code: MK5KIBER4R217-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Year, Semester: 1st fall semester

Its prerequisite(s): -

Further courses are built on it: Yes/No

Number of teaching hours/week (lecture + practice): 0+4

Topics:

To get to know cyber security, and within it the critical information regarding the safety of the infrastructure, also the blocks of safety and the criteria of formative, condition and function systems. To give an insight into the infrastructure of the components of security, and the requirements of its planning. To help in getting to know the new research results regarding the field. To motivate the students to engage in research in new fields. The module helps the students in acquiring knowledge regarding their field of research by learning the basics in engineering - security science.

Schedule

1st week Registration week	
2nd week: Practice: Introduction to the web of security problems. The cyber dangers and the complex handling of it. Global cyber security and in regards to home.	3rd week: Practice: The set-up of the internet and the outline of how it works. (ISP, IXP, POP, network backbone). Layered architecture ISO/OSI, TCP/IP and hybrid models.
4th week: Practice: Wireless technologies, VPN base and monitoring network systems.	5th week: Practice: Network operating systems security, firewall operation. Monitoring of network systems.
6th week: Practice: Foundation knowledge in cryptography, Encrypted algorithms.	7th week: Practice: Classified workshop.
8th week: 1st drawing week	
9th week: Practice: Digital identifier, safety of communication services.	10th week: Practice: Authentication protocols. E-mail and web safety.
11th week: Practice: Analyzing digital footprints in the IT event space Sealog.	12th week: Practice: Minimizing losses through imposition-scan Sealog
13th week: Practice: Features of cyber-crime, classification of IT crimes. Weak points of given webs.	14th week: Practice: Classified workshop.
15th week: 2nd drawing week	

Requirements

A, for a signature:

Partaking in workshops in compliance with the regulations of the Rules and Regulations. The correct keys to homework and respecting the deadlines. Solving assorted tasks.

B, for grade:

The practical grade is the evaluation of project.

Workshop grade on assignments and average on final exams.

XX in the Loop Systems

Code: MK5XXLRR6R217-EN

ECTS Credit Points: 6

Evaluation: exam

Year, Semester: 1st fall semester

Its prerequisite(s): -

Further courses are built on it: Yes/No

Number of teaching hours/week (lecture + practice): 2+2

Topics:

The put together, in real time, during the testing of the embedded critical systems the so called hardware in the loop (HIL) testing technique was used. The HIL makes troubleshooting more efficient, and makes the product's waiting time to get on the market shorter, and lessens the improvement costs. The goal of these proceedings, that the examined tool used during testing, to be in a similar physical environment and to function. The making of the HIL system is complex and is about integration the systems and simulations into the environment. Real time simulations to be done in a simulation environment, and measurement of virtual telemetry data and make meaning of them. To apply changes on the given simulation system, to make it more efficient.

Literature:

Recommended:

- Encyclopedia of Automotive Engineering, Discrete Engineering to Configure the ECU and Components (2014), Susanne Köhl, Markus Plöger, DOI: 10.1002/9781118354179.auto193
- Hardware-in-the-Loop Simulation, (2015) Ron T. Ogan, ISBN 978-1-4471-5633-8

Schedule

1st week Registration week	
2nd week: Lecture: cRIO and configuration. Practice: Make a hardware and software demonstrative HIL environment (National instruments or on other tools).	3rd week: Lecture: Use of simulation toolkit on cRIO system. Practice: Make a hardware and software demonstrative HIL environment (National instruments or on other tools).
4th week: Lecture: Inter-process communication. Practice: Make a hardware and software demonstrative HIL environment (National instruments or on other tools).	5th week: Lecture: Communication with computer. Practice: Make a hardware and software demonstrative HIL environment (National instruments or on other tools).
6th week: Lecture: Programming of FPGA.	7th week: Lecture: Theoretical test writing.

Practice: Make a hardware and software demonstrative HIL environment (National instruments or on other tools).	**Practice:** Make a hardware and software demonstrative HIL environment (National instruments or on other tools).
8th week: 1st drawing week	
9th week: **Lecture:** Communication with the FPGA core. **Practice:** Make a hardware and software demonstrative HIL environment (National instruments or on other tools).	**10th week:** **Lecture:** Use of PWM. **Practice:** Make a hardware and software demonstrative HIL environment (National instruments or on other tools).
11th week: **Lecture:** Servo and step motor usage. **Practice:** Make a hardware and software demonstrative HIL environment (National instruments or on other tools).	**12th week:** **Lecture:** Temperature control. **Practice:** Hand in assignment.
13th week: **Lecture:** Implementation of HIL. **Practice:** HIL rating.	**14th week:** **Lecture:** Theoretical test writing. **Practice:** HIL rating.
15th week: 2nd drawing week	

Requirements

A, for a signature:

Participation on practice, according to Rules and Regulations. The correct solution of the homework and submission before deadline.

B, for grade:

Oral exam on theoretical part.