# UNIVERSITY OF PANNONIA

## SUBJECT DATASHEET

| | |
|---|---|
| **Semester:** | 2011/12/1 |
| **Subject:** | Software.in-the-Loop and Hardware-in-the-Loop testing related to Aotomotive System |
| **Code:** | VEMKGEM453T |
| **Responsible department:** | Department of Mechanical Engineering |
| **Responsible department code:** | MKGE |
| **Responsible lecturer:** | Dr. Dénes Fodor |

**Educational objectives:**

The software of embedded systems in the automotive area must fulfill high safety requirements. Tests must enclose the interaction with the hardware and the physical environment. The usual approach for such tests is the HIL (Hardware-In-The-Loop) test. The completely integrated system, consisting of hardware and software, is coupled with a simulation of the environment and is executed on a real-time basis.
An alternative or additional approach is the SIL (Software-In-The-Loop) test which couples partially integrated software with an environment simulation. Instead of the usage of electrical interfaces, software interfaces provided by the operating system are used here which allows a direct information-technical communication with the simulation. SIL tests can be introduced early during the software development and offers the possibility to execute tests before the Hardware & Software integration tests.

**Detailed content of the subject:**

| |
|---|
| SIL (Software-In-The-Loop) simulation principle |
| SIL (Software-In-The-Loop) realization |
| HIL (Hardware-In-The-Loop) simulation principle |
| HIL (Hardware-In-The-Loop) realization |
| Matlab SIL simulations |
| Matlab SIL tests |
| LabView/Veristand SIL simulations |
| LabView/Veristand HIL simulations |
| Continental HIL (CVT) introduction |
| Continental HIL (CVT) simulations |
| Continental HIL (CVT) tests |
| Different Applications |

**Requirements:**

**Required and suggested references:**

# UNIVERSITY OF PANNONIA

## SUBJECT DATASHEET

| | |
|---|---|
| **Semester:** | 2011/12/1 |
| **Subject:** | Software.in-the-Loop and Hardware-in-the-Loop testing related to Aotomotive System |
| **Code:** | VEMKGEM453T |
| **Responsible department:** | Department of Mechanical Engineering |
| **Responsible department code:** | MKGE |
| **Responsible lecturer:** | Dr. Dénes Fodor |

**Required and suggested references:**

Ian Sommerville: Szoftverrendszerek fejlesztése, Panem Kiadó, 2002
IEC61508
Qing Li / Caroline Yao: Real-Time Concepts for Embedded Systems
David E. Simon: An Embedded Software Primer