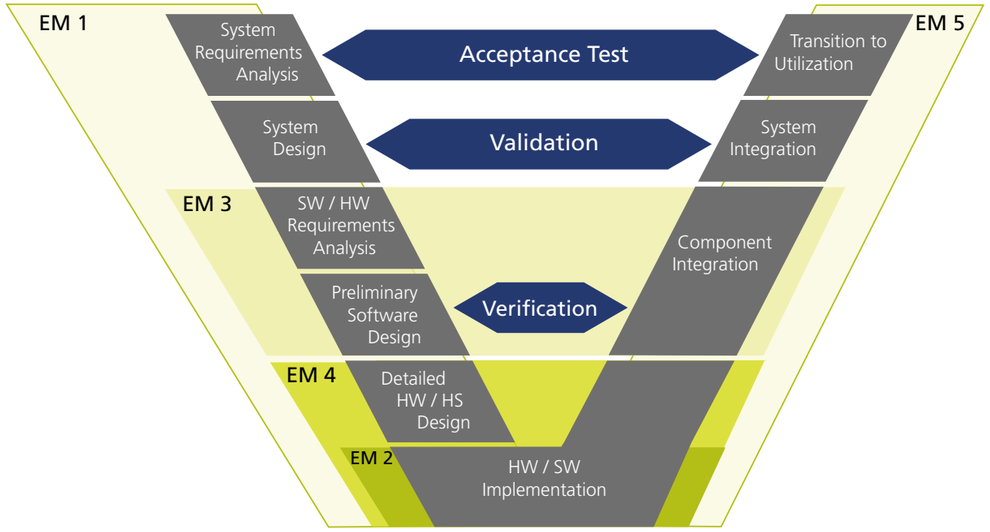
Engineering Modules (EM)

State-of-the-Art Technology Expertise in Embedded Systems



EM 1: Processes, Methods & Tools of ESEM

At the beginning, an introduction to embedded systems and software engineering is given. Processes, methods and tools from object-oriented approaches via the V-model to agile methods are presented. Among those, HW-/SW-Co-design and rules how to decide which way to go are explained. All these aspects are discussed considering the constraints of distributed development all around the world. How to assess these approaches according to SPICE and CMMI and how to follow safety (relying on ISO 26262) and security demands is introduced focusing on the transportation industry.

EM 2: Components of Electronic Systems

In order to realize an embedded system in the end, concrete components must be used. Controllers and processors or ASICs and FPGAs will implement the application. The environmental interface is enabled with actuators and sensors. All these technologies will be explained in this module.

EM 3: Data Communication Technologies & Systems

The concrete components work together collaboratively. Data communication between them is needed. Signals carry information to achieve that on a wired bus or even over the air. Communication protocols will be presented for specific demands such as car2car communication or industry 4.0.

EM 4: Implementation & Component Realization (Hardware/Software)

Now, knowing all the processes, methods and tools, all the components and how to combine them, the next step is to implement and realize the embedded mechatronic system. Synthesis in hardware or software must be considered. Especially in the software area, coding structures, code generation and clever programming are essential. A case study will help to get used to current standards and quasi standards.

EM 5: Systems Integration & Validation Total Quality Management of Electronic Systems

Implementation and integration leads to testing the overall system according to the early requirements. During the overall process of engineering, testing has been prepared and done in order to check the maturity level. Quality assurance has been executed in simulations and prototyping environments. At the end of those phases, the real system can be tested for the first time to finally check the user requirements in a hardware-in-the-loop environment or even in real test scenarios.

Order your free course guide book with detailed contents of the master program!

Engineering Modules

EM 1: Processes, Methods & Tools of ESEM

Courses: Introduction to Embedded Software and Systems Engineering | Collaborative Development Processes and Project Management | Process Models & Associated Assessments | Case Study in Embedded Systems Development (incl. Rapid Prototyping) | Modeling & Simulation

EM 2: Components of Electronic Systems

Courses: Optical Actors & Sensors | Control Systems Development | VLSI-Technology & Nanoelectronics | Embedded Systems Computer Architecture

EM 3: Data Communication Technologies & Systems

Courses: Integrated Circuit & Systems Signal Processing | Communication Systems & Protocols | Mobile Perception Systems

EM 4: Implementation & Component Realization (Hardware/Software)

Courses: Micro Systems | Roadmap for Electronic Product Development | Electronic Systems Synthesis (HW/SW) | Case Study of Electronic Subsystems | Software Development

EM 5: Systems Integration & Validation Total Quality Management of Electronic Systems

Courses: Quality Assurance Management & Cost of QA of Electronic Systems | Testing Embedded Systems (XiL, virtual testing, ...) | Systems Engineering | Case Study in Testing Embedded Systems