HECTOR SCHOOL
Technology Business School of the KIT

KIT
Karlsruhe Institute of Technology

Technical Short Course
Systems & Software Engineering

INDUSTRY 4.0

DIGITALIZATION

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Learning Targets are Aimed on:

- Development of innovative electronical products (Cyber Physical Systems)

- Profound understanding of theories, methods & applications of computerized processes in all phases of the lifecycle of an embedded system

- Application of methods and tools of the model based analysis, the draft, the analysis and the inspection process of hard- and software

- Classification of the product development process with the total of the entrepreneurial process and knowing the systematic planning of a process

- Optimization of embedded systems regarding quality, cost and market introduction criteria

- System-orientated, interdisciplinary approach

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3-day Seminar: Compact Scheduling

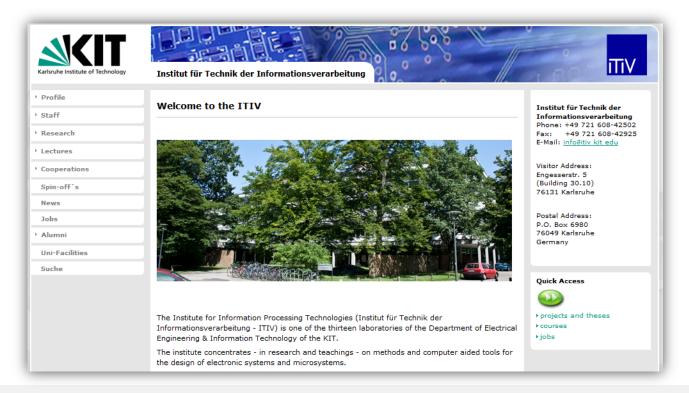|	First Day	Second Day	Third Day
8:00			
8:00 – 9:30	Lecture	Lecture	Lecture
9:45 – 11:15			
11:30 – 13:00			
Lunch Break			
14:00 – 15:30	Lecture	Excursion	Exam (optional)
15:45 – 17:15			Conclusion & Farewell 16:00
17:15			

Course Agenda

Introduction to Systems & Software Engineering	- Motivation and examples - Terms and definitions - Introduction to system structure & communication (e.g. smart systems) - Transducers
System Lifecycle Models	- Phase models - Creativity techniques - Maturity models
Programmable Electronic Systems	- Implementation alternatives (hardware) - Computer programs & operating systems (e.g. structure of real-time kernels)
Modeling Data and Functions	- Introduction to modeling & simulation - Modeling software systems (basic concepts: description methods) - Software reliability (ISO 26262, ASIL, failure rate) - Modeling hardware & systems (VHDL, SysML) - Testing (e.g. HiL & ViL) - Managing versions

Excursion with Practical Demonstrations

- Destination: **Institute for Information Processing Technology (ITIV)** of the Karlsruhe Institute of Technology (KIT)

- Demonstration of the current state of research & innovation

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Course Instructor Expertise

- Head of Institute for Information Processing Technology at the Karlsruhe Institute of Technology, KIT

- Research Focus: Systems Engineering

- Director for Electronic Systems & Sensors, FZI (Research Center for Information Technology at the KIT)

- Extensive experience in industry

- Personal vita and details:
  https://www.itiv.kit.edu/21_3940.php

Prof. Dr.-Ing. Eric Sax

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