

Technical Short Course
Systems & Software Engineering

 INDUSTRY 4.0

 DIGITALIZATION



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



3-day Seminar: Compact Scheduling

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

Course Agenda



Introduction to Systems & Software Engineering	<ul style="list-style-type: none">▪ Motivation and examples▪ Terms and definitions▪ Introduction to system structure & communication (e.g. smart systems)▪ Transducers
System Lifecycle Models	<ul style="list-style-type: none">▪ Phase models▪ Creativity techniques▪ Maturity models
Programmable Electronic Systems	<ul style="list-style-type: none">▪ Implementation alternatives (hardware)▪ Computer programs & operating systems (e.g. structure of real-time kernels)
Modeling Data and Functions	<ul style="list-style-type: none">▪ 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



The screenshot shows the homepage of the Institute for Information Processing Technology (ITIV) at the Karlsruhe Institute of Technology (KIT). The page features a blue header with the KIT logo on the left and the ITIV logo on the right. Below the header, there is a navigation menu on the left side with links to Profile, Staff, Research, Lectures, Cooperations, Spin-off's, News, Jobs, Alumni, Uni-Facilities, and Suche. The main content area is titled "Welcome to the ITIV" and includes a photograph of the institute's building. To the right of the photo, there is contact information for the institute, including phone, fax, and email addresses, as well as visitor and postal addresses. A "Quick Access" section at the bottom right provides links to projects and theses, courses, and jobs.

KIT
Karlsruhe Institute of Technology

Institut für Technik der Informationsverarbeitung

ITIV

Profile
Staff
Research
Lectures
Cooperations
Spin-off's
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Jobs
Alumni
Uni-Facilities
Suche

Welcome to the ITIV

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Quick Access

[▶ projects and theses](#)
[▶ courses](#)
[▶ jobs](#)

The Institute for Information Processing Technologies (Institut für Technik der Informationsverarbeitung - ITIV) is one of the thirteen laboratories of the Department of Electrical Engineering & Information Technology of the KIT.

The institute concentrates - in research and teachings - on methods and computer aided tools for the design of electronic systems and microsystems.

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

