

Certificate Course

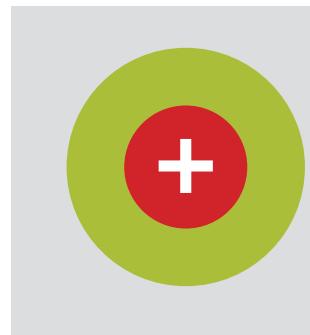
Internet of Things (IoT): Modern Network Infrastructure

The certificate course **Internet of Things (IoT): Modern Network Infrastructure** provides an overview of and insights into modern network infrastructures, methods and approaches to design and evaluate these infrastructures, as well as an overview of techniques that are essential enablers of future IoT systems. A special focus is laid on particular techniques that allow distributed entities to communicate and interact efficiently in both cooperative and non-cooperative environments.

Course Benefits & Take Away for Participants

The participants will

- learn about systems and technologies of modern computer networks and infrastructures;
- get an overview of technologies in mobile communication;
- learn about methods & approaches to design and evaluate future IoT systems in which distributed, heterogeneous and autonomous agents need to collaborate and coordinate their actions in order to achieve both individual and system-wide goals;
- will be able to situation-relatedly choose, rate design and apply these methods and systems.



Overview Course Agenda

This certificate course focuses on modern network infrastructures, the basics of computer networks, mobile communication networks, technologies in the internet of things and methods and approaches to design and evaluation of complex collaborative multiagent systems. Topics of the agenda will be:

	Day 1	Day 2	Day 3
8 am - 1 pm	Lecture	Lecture	Lecture
	Lunch Break		
2 - 5:30 pm	Lecture	Excursion	Conclusion & Farewell (Exams optional)

- Brief introduction to network computing technologies
- Basics of network communication
- Different network infrastructures and their classification
- Basics of mobile communication networks
- Technologies in the IoT
- Design of IoT infrastructures
- Design & analysis of intelligent agents and multiagent systems
- Methods for communication & interaction in IoT systems
- Mechanisms for collaboration & coordination in cooperative and non-cooperative environments

Exemplary Schedule of a 3-day Certificate Course

Agenda in Detail

Day 1	Day 2	Day 3
<p>Session 1: Introduction Terminologies Facts History Outlook on Evolving Nets</p> <p>Session 2 & Exercise: Basic of Networks Communication & Data Communication Model of (data/tele) communication Distributed Applications Protocols, Protocol Stack Layer Model</p> <p>Session 3: Modern Networks IPv4 vs IPv6 Voice-over-IP/ Video Telephony/ Web Conferences Acutal Protocols Wireless Communication The Dark Net</p> <p>Session 4: Mobile Communication & Networks GPRS and EDGE UMTS and HSPA Long Term Evolution (LTE) and LTE-Advanced</p>	<p>Session 1: Mobile Communication & Networks II Bluetooth Near Field Communication Next Generation Handover Security in Modern Network Infrastructures</p> <p>Session 2 & Exercise: Internet of Things Challenges & Opportunities Exploring Major Architectural Aspects of the Web of Things High-Level Internet of Things Applications</p> <p>Session 3: Multiagent Systems From Distributed Systems to Multi-agent Systems Introduction to Multi-agent Systems</p> <p>Session 4: Complex Adaptive Systems Definition & Overview Introduction to Network Science Emergence</p>	<p>Session 1: Agent-Based Modelling & Simulation Modelling Complex Systems Agent-Based Modelling: Overview Modelling Frameworks & Programming Languages The Modelling & Simulation Lifecycle</p> <p>Session 2: Strategic Interaction Motivation & Introduction Formalising Strategic Interactions: Introduction to Game Theory Emergence of Cooperation Trust & Cooperation in Multi-agent Systems</p> <p>Session 3: Mechanism Design Motivation Truth-eliciting Interaction Protocols Example: The Bitcoin Blockchain</p>

Registration & Organizational Details

Duration	3 days
Prize	2.495 € per participant
Group Size	max. 15 participants
Certificate	Certificate of the HECTOR School of Engineering & Management, Technology Business School of the Karlsruhe Institute of Technology (KIT)
Registration	Register online via www.hectorschool.kit.edu/certificate_courses.php

Admission Requirements:

- First University Degree (Bachelor, Diploma or equivalent)
- A minimum of 5 years of professional experience in the specific field of the course is recommended
- The course can be held in German or in English – appropriate skills in the respective language are required. For international companies translators can be hired.



For consultancy or company arrangements please contact:

Program Consultancy

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