



Executive Master Program Service Management & Engineering

Technology + Management

The HECTOR School is the Technology Business School of the Karlsruhe Institute of Technology (KIT). It is named after Dr. Hans-Werner Hector, one of the co-founders of SAP AG.

The school aims to provide professionals with **state-of-the-art technological expertise and management know-how within part-time education programs**. The HECTOR School fosters lifelong learning within industry. Participants are supported in their career development with executive master degree programs, certificate courses, and customized partner programs.

The benefits of the executive master programs are numerous for participants as well as for the companies they work for:

- **Unique Holistic Approach:** A combination of technology expertise and management know-how.
- **State-of-the-Art Knowledge:** Direct transfer from the Karlsruhe Institute of Technology (KIT) research.
- **Part-Time Structure:** Allows participants to continue with their demanding careers whilst acquiring new skills.
- **Master Thesis to set up Innovation Projects:** Companies gain outstanding added value through the consultation of such projects by professors from KIT.
- **Excellent Networking Opportunities:** Professional networking is fostered across industries and on an international scale.



Portrait of the HECTOR School
on our YouTube Channel



Prof. Dr. Andreas Oberweis
Institute of Applied Informatics & Formal
Description Methods, KIT

Prof. Dr. Alexander Mädche
Institute of Information Systems and Marketing, KIT

Prof. Dr. Martin E. Ruckes
Institute of Finance, Banking, and Insurance, KIT

Program Directors SME

»Our future world will be a service world. The development of successful strategies, business models and business processes adapted to this service world requires a profound understanding and integration of technological, economical and social issues. New technologies such as cloud computing, big data, web 3.0 and mobile networking are the basis for engineering and managing innovative smart and secure service systems.«

Prof. Dr. Andreas Oberweis

Information-based services, individualized solutions and interactive cooperations will characterize tomorrow's world, linking together agile, dynamic and global service networks of providers and customers. Capturing the emerging opportunities requires globally thinking visionaries, engineers, and managers, who are able to combine profound competence in information technology with excellent know-how in economics, management and law.

Graduates of the Master Program Service Management & Engineering (SME) have the ability to comprehend and evaluate in which way hardware as well as software developments in modern information and communication technologies influence the future service market. They are also in a position to make efficient and effective use of these technologies. Competitive and innovative service products are developed and optimized to successfully

accompany and direct service-driven changes in companies and corporate networks.

When faced with incomplete information and technical uncertainty, graduates encounter problems with an engineering orientation and solve them with the help of complex management methods. The program empowers them to apply an interdisciplinary approach to problems and trains adequate solution finding methods for hardware and software applications. Furthermore, graduates are enabled to solve economic problems of service pricing with the respective interdisciplinary approaches. The analyzing and optimization of life-time cycles of business processes are part of the graduates' competence profile as well as the evaluation and advancement of software architecture options and aspects of quality improvement. Finally, they can evaluate regulatory boundaries and legal issues when negotiating contracts and take them into account when making design decisions.

In addition to the engineering expertise, Service Management & Engineering shares five management modules with the other master programs. This fosters networking across industries and provides the participants with general knowledge in finance, accounting, marketing, international multiproject management, international law, and human resource management. Therefore, they can consider the commercial implications of project decisions and develop a holistic view.

Key Facts: Part-Time Master of Science (M.Sc.) Programs

Program Structure

- Part-time, 10 x 2-week modules
- Duration: part-time lecture period of ~15 months
- Master thesis: project work in the company, 6 months
- 5 Engineering and 5 Management Modules
- Teaching language: English
- Yearly program start: October

Academic Degree

Master of Science (M.Sc.) from the KIT (90 ECTS)

Admission Requirements

- An academic degree: e.g. Bachelor, Master, or Diploma
- 1-2 years work experience (depending on the level of the first degree, recommended > 3 years)
- TOEFL score of at least 230 or 90 iBT

Accreditation

The KIT is system-accredited by AAQ. All HECTOR School master programs are accredited by the internal quality assurance system of the KIT.



Engineering Modules (EM)

State-of-the-Art Technology Expertise in Service Management



EM 1: Information & Service Management

Nowadays service markets are characterized by a close interrelation with information service management due to the original set-up of service markets. Therefore, the overall objective of the module is to provide the fundamentals of market engineering with an emphasis on the design and the further development of information markets and services.

The module enables participants to understand and analyze business innovation & adaption processes and thus get an idea of, among other things, innovation diffusion. Innovation driver analyses make participants systematically identify the difference between invention and innovation.

Since the structure of information markets is discussed, participants are able to develop an understanding of how market actors operate. In addition, the consideration of service competition as a business strategy helps participants structure the impact of service competition on business design, markets, products, processes, and services.

EM 2: Service Technologies

This module focuses on two important aspects: first, the design and engineering principles behind current networking technologies and second, on security problems and solutions identified regarding those technologies thus far.

The knowledge imparted in *Advanced Computer Networks* enables participants to understand the interactions of network components and apply the relevant facts to design principles for current service technologies and networks.

Current modeling and programming languages e.g., HTTP, SOAP or WSDL, explain the architecture of web applications. In terms of security, fundamentals of cryptography and their applications in complex safety systems are introduced. Cloud computing concepts and technologies taught within the module enable the participants to assess the opportunities and challenges of web-scale service applications while keeping the current state-of-the-art IT safety and security technology in mind.

EM 3: Digital Services

This module focuses on advanced concepts and methods that are essential in digital service systems and e-applications. Understanding the need for information and knowledge management in businesses, participants of the module are able to implement concepts for the modeling, representation, and administration of information and knowledge. Based on the acquired methods and systems to support e-commerce, the participants are qualified to select, evaluate, design, and apply these methods and systems according to the situation at hand.

A reliable functionality of the networked digital services requires the management of complexities. In this specific part of the

module, participants become acquainted with the framework conditions of complexity management and, after the analysis of the psychological, computer-related, dynamic, and managerial aspects, are enabled to further develop complexity management according to the businesses' demands. After having learned the meanings of "information" and "pricing", the participants can develop a differentiated view on the pricing of goods and information goods. Based on a case study involving the price elasticity of demand, they develop application and implementation strategies which, in turn, require suitable team & communication skills.

EM 4: Business Processes & Software Engineering

In business organizations, business process and software engineering are known to be closely linked to one another. The participants in this module gain the ability to effectively and efficiently adapt the particular demands of business processes using a technical approach that applies both the tools and methods of business process engineering and of software systems. They obtain a detailed overview of the stages of software systems development and they are qualified to apply the tools and methods of the development process.

EM 5: Regulations & Economics of Networks

The fundamental knowledge of communication law supports participants in the adaptation of business strategies to today's media and information industry and is in the focus of this module. The participants are able to identify and solve relevant problems in the areas of information, data protection, and business law.

In the part Network Economics, they implement price models and business strategies as economic concepts reacting to changed market conditions in the transportation or telecommunications sectors, for example. The participants are qualified to identify and take into account the problems (e.g. "moral hazard" and "adverse selection") that are linked to contract design.



Order your free course guide book with detailed contents of the Master Program!



Engineering Modules

EM 1: Information & Service Management

Courses: Introduction to SME
Digital Transformation of Service Systems
Innovation of Services
Information & Market Engineering

EM 2: Service Technologies

Courses: Advanced Web Applications
Modern Network Infrastructures
IT Safety & Security
Cloud Computing

EM 3: Digital Services

Courses: Information & Knowledge Management
IT Aspects of Mobile Business
Information Pricing
Service Pricing
Big Data

EM 4: Business Processes & Software Engineering

Courses: Business Process Engineering
Software and Systems Engineering

EM 5: Regulations & Economics of Networks

Courses: Communication Law
Industrial & Network Economics
Economics of Contracts

Management Modules (MM)

Fundamental Economic Know-How for Successful Managers



MM 1: INNOVATION & PROJECTS. Numerous paradigm shifts are currently being driven by the development and extensive use of new technologies. Profound changes in rapidly changing markets flow directly from this. Consequently, apart from classic project management, new management tools and methods are required, because agility and innovation are some of the success factors in the current business climate. The module thus focuses on one of KIT's unique selling points: technology-driven innovation.

MM 2: FINANCE & VALUE. Modern corporate governance is based on the creation of values. In the Finance & Value module, students learn essential methods of measuring, processing, and communicating the value added by corporate decisions that enable effective planning, management, and monitoring of corporate activity and corporate units. External value-based communication makes it possible to win stakeholders who are committed to the company over the long term.

MM 3: MARKETING & INFORMATION. Many of today's most successful businesses excel in satisfying customer needs, because their decisions are based on data instead of gut feeling. This is what this module is about. One week looks at how to use data for designing customer solutions (and get paid according to their value). The other week looks more generally at issues surrounding the use of (big) data for business decision-making.

MM 4: STRATEGY & PEOPLE. The key to corporate success lies in the correct strategy. But how do you recognize opportunities, develop a viable concept, and successfully implement it? In times of scarce human capital, it is more important than ever before to ensure employees are a perfect fit for their position and to motivate them to implement the strategy together. The module imparts state-of-the-art management techniques and know-how on evidence-based human resources management, people analytics, and leadership approaches.

MM 5: DECISIONS & RISK. Management implies making decisions. A valid data warehouse forms the basis for these decisions. The aim of this module is to give students a toolkit of various quantitative decision-making models, so that the possibilities and limitations of methodical decision-making support (among others also optimization methods) can be used efficiently in the day to day running of projects.

Management Modules

Management is becoming increasingly complex and networked in data-driven companies (INFORMATION). Therefore, engineers and managers must obtain a holistic understanding of all corporate divisions to be able to make complex decisions (DECISIONS & RISK) in a future and result-oriented manner (INNOVATION & PROJECTS) from the perspective of the market (MARKETING), the employees (PEOPLE & STRATEGY), and the company (FINANCE & VALUE).

A HECTOR School Master: Leadership Know-How for Demanding Careers.



Oliver Gündling
Master in Service Management & Engineering
Interactive Data Corporation

»The master program offers an excellent synergy of the disciplines informatics, business administration and international law. Close collaboration with lectures and applied studies in small groups with students from several industries supported me to share knowledge and bring state-of-the-art expertise into my business. Thanks to the well organized program and compact lecture sessions, I was able to successfully manage my studies alongside my job. In summary, the master program enriched both my expert knowledge and professional career.«

 **Alumni Voices**
on our YouTube Channel 

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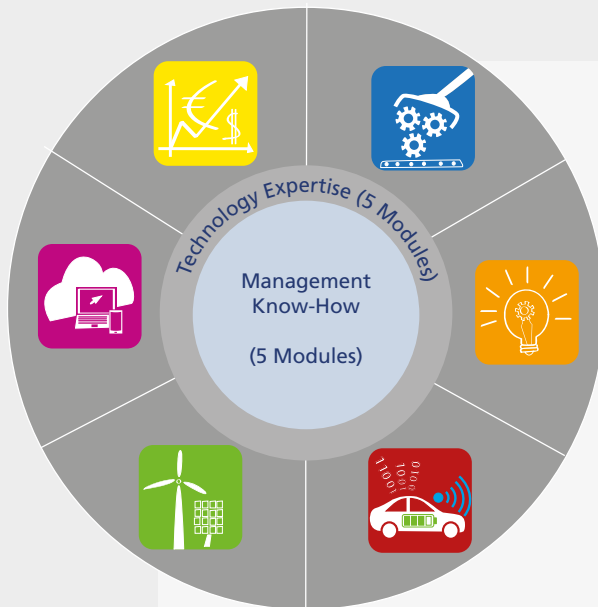
- MM Management Modules
- EM Engineering Modules
- Exams

Crash Courses 9. + 10. November: - Probability and Statistics (2-day seminar)
5. – 9. November: - Electronic Engineering
- Fluid Mechanics and Thermodynamics

Please note: Dates are subject to change.

The academic calendar for each program starting annually in October consists of 10 intensive modules, each with a duration of 10 days. At the end, all programs conclude with a master thesis. >> **Master Thesis:** 9 months project work

More Master Programs



Six Part-Time Master Programs

- Production & Operations Management (POM)
- Management of Product Development (MPD)
- Mobility Systems Engineering & Management (MSEM)
- Energy Engineering & Management (EEM)
- Service Management & Engineering (SME)
- Financial Engineering (FE)



In addition to the master programs, the HECTOR School also offers **certificate courses** (3 - 5 day seminars on state-of-the-art technology topics) and **partner programs**.



HECTOR School of Engineering & Management

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