



Executive Master Program Service Management & Engineering



Master Program Schedule

The Master Programs are designed for working professionals. Intermittent periods of lectures are scheduled to allow participants to continue with demanding careers while acquiring new skills.

The programs lasts over a period of 18 - 20 months. They are divided into ten intensive modules of 14 days, each alternating with monthly breaks. The programs are completed with a masters thesis.

The primary goal of our programs is to enable young professionals to take a holistic approach when managing highly interdependent processes. Leadership for

engineers in today's fast changing and complex environment does imply technological and organizational responsibilities as well as requires economical accountability and Human Resource Management know-how.

The engineering emphasis is laid on 5 Modules adapted to each specialization. The lectures provide insight into the newest research topics and convey current and state of the art methodology necessary to master the scope of innovative technologies.

The following timetable shows the schedule for the Master Intake 2013. Current programs are also available depending on open places.

March 2013							April 2013							May 2013							June 2013							
Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	
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04	05	06	07	08	09	10	08	09	10	11	12	MM 2		06	07	08	09	10	11	12	03	04	05	06	07	08	09	
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November 2013							December 2013							January 2014							February 2014							
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March 2014							April 2014							May 2014							June - September 2014							
Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Master Thesis (company project): June - September 2014							
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31																												

MM Management Modules EM Engineering Modules



Service Management & Engineering

SME provides methods and tools to drive innovation via ICT-based services

In most developed countries, about two thirds of the economy already thrive on services. However, the journey into a truly service-led economy is just beginning: with the rapid strides in the development of information and communication technology, plenty of options are unfolding to co-create value with customers. 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 that are able to combine profound competence in information technology with excellent know how in economics, management and law.

Therefore, the SME master program has been designed as an interdisciplinary program centred around ICT-based services. It draws on the long business engineering tradition in Karlsruhe and benefits from the experience of renowned KIT faculty. It will enable students to understand how significantly modern ICT will shape the future service economy. At the same time, it will empower students to exploit these technologies to develop competitive and innovative service offerings and to drive the service-oriented transformation of businesses and business networks.

The ever increasing share of the service sector, the strategic importance of ICT-based services for all types of businesses, and the tightened competition in the field, leads to a growing worldwide demand for highly qualified specialists in service management and engineering. With the completion of the program – having earned a Master of Science (M.Sc.) of the globally well-known Karlsruhe Institute of Technology (KIT) –, participants are well positioned to fill this urgent demand for leadership positions in emerging and traditional industries applying ICT-based service concepts.



»Information Technology for business success: Efficiency, reliability, flexibility and safety are key issues for information systems in the internet age. The program provides approved engineering methods for successful information systems modelling, design and implementation.«

Prof. Dr. Andreas Oberweis
Program Director Service Management & Engineering
Head of Institute of Business Information Systems, KIT



Content Management Modules

The aim of the 5 Management Modules (MM) is to provide profound knowledge and understanding of the fundamental concepts which are essential for every successful manager.

- MM 1 Accounting & Controlling: Financial Accounting | Management Accounting
- MM 2 International Project Management: Project Management & Scheduling | Information & Process Modelling | Multiproject Management in an International Setting | Development Management | Intercultural Management | Project Risk, Change and Profit Management
- MM 3 Finance & Marketing: Fundamentals of Finance | Marketing | Marketing & Business Strategy | Intercultural Communication
- MM 4 Stochastic & Games: Stochastic Models & Optimization | Applied Game Theory | Simulation & Case Studies
- MM 5 Law & Contracts: International Intellectual Property Law | Decisions, Contracts, Markets and Trade | International Law - The Law of Business Organizations

MM 1: Accounting & Controlling

Accounting focuses on measuring, processing and communicating information. In this course the concepts of both financial and managing accounting are covered, providing a powerful framework which supports participants in making successful business decisions. Particular emphasis is placed upon the implementation of new technologies in the current business environment and the analysis of real world business cases and relevant business practices.

MM 2: International Project Management

International Project Management is a key to the world of business. In order to become fully acquainted with this important discipline the module aims to help the participants to understand the objectives of project management and scheduling, to learn how to analyse planned projects and to control project execution. Particular attention is paid to the construction of project networks and Gantt charts, heuristic solution procedures and rescheduling as well as the completion of temporal and resource-constrained project scheduling computations. Modelling, planning and scheduling, which arise in a great variety of practical situations, are also emphasized.

MM 3: Finance & Marketing

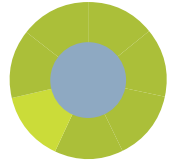
This module is comprised of two of the most important issues in management: Fundamentals of Finance and Marketing. The former addresses two fundamental financial questions, which are central to corporate and private investment: how to raise capital and how to invest it. Marketing focuses on creating optimal interaction between interest groups (e.g. company and customers, authorities and citizens, political parties and voters).

MM 4: Stochastic & Games

The module presents advanced techniques in modeling and analyzing stochastic systems and strategic decision problems as well. The module will enable the students to get a better understanding of stochastic phenomena, and, in particular, to use this knowledge in making decisions under uncertainty, where uncertainty can arise either from "nature" or from playing against conscious opponents ("strategic uncertainty").

MM 5: Law & Contracts

This module comprises both economics and legal sections. In the economics section, a groundwork is laid through introducing decision theory, expected utility, risk and ambiguity, bargaining and basic incentive theory. In addition, fundamental problems regarding world economics are discussed, for example stagnation and economic growth, unemployment and international division of labor, and harmonization of the international monetary system. The legal section is divided into lectures about the law of business organizations and lectures about international patent, trademark and copyright law.



Content Engineering Modules

- EM 1 Information & Service Management: Information & Market Engineering | Service Management | Service Innovation
- EM 2 Service Technologies: Advanced Computer Networks | Advanced Web Applications | IT Safety and Security| Cloud Computing
- EM 3 Digital Services: Information & Knowledge Management | IT Aspects of eCom-merce | Complexity Management | Information Pricing | Service Pricing
- EM 4 Business Processes & Software Engineering: Business Process Engineering | Software & Systems Engineering
- EM 5 Regulations & Economics of Networks: Communication Law | Network Economics | Transport Network Economics | Telecommunication Network Economics | Economics of Contracts

EM 1: Information & Service Management Information & Market Engineering

Participants learn to comprehend, to enhance, and to evaluate the design potentials of electronic market platforms in their entirety. They learn to organize their integration into traditional business processes as well as into innovative dynamic (supply) networks and to develop and implement solutions to interdisciplinary questions.

Service Management

The targets of this course are for participants to understand the structure and nature of information markets and services and to evaluate the conduct of market participants and information providers and consumers.

Service Innovation

Participants will discuss the state of research, compare product and service innovation and understand how innovation diffusion works. Furthermore they will examine case studies of service innovation, open vs. closed innovation, how to leverage user communities to drive innovation, understand obstacles and enablers and how to manage, incentivize and foster service innovation.

EM 2: Service Technologies

Advanced Computer Networks

This course starts with a short repetition of networking basics and discusses the internet architecture including its design principles. An overview of the next internet protocol generation "IP Version 6" is given. Current trends in multimedia communications are presented as well as mechanisms and architectures to support quality of service and resource management in networks. Current techniques and protocols for Voice over IP or peer-to-peer networks are discussed as well. Basics of multicast are described which

constitute a basis for providing efficient support for group communications.

Advanced Web-Applications

The architecture of a web-based system comprises the architecture of the web application and the architectures of the underlying networked system. Multi-layered application architectures and service-oriented architectures (SOA) based on web service standards are introduced, and languages to model and specify these architectures are presented. In a first case study on communication issues and web services the technical aspects of advanced web applications are detailed. A second case study on service engineering and service management shows how advanced web applications have to be designed to adequately support business processes. An insightful overview of process-oriented integration of existing IT-Systems is discussed.



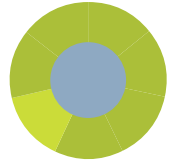
In addition methods and technologies are discussed to composite basic web services to complex web services and to build advanced web applications oriented on business processes. Additionally service management aspects are shown to ensure the quality of services offered to users.

IT Safety & Security

The course starts with basic foundations of cryptographic techniques including symmetric ciphers, hash functions, public key encryption and digital signatures. Building on these foundations, more complex security protocols are studied. Especially secure voting is discussed as a complex security application for which even the definition of security is non-trivial. Basic models and methods from computer security are taught, including the Bell LaPadula model for access control. All theoretical topics are enriched with case studies which show the limits of theoretical modeling and help building the mindset needed for successful work in the area of IT security.

Cloud Computing

Building on compute and storage virtualization, cloud computing provides scalable, networkcentric, abstracted IT infrastructure, platforms, and software applications as on-demand services that are billed by consumption. Innovative business models, cost efficiency, and faster time-to-market are the expected benefits associated with Cloud Computing. Participants will become familiar with concepts and technologies of Cloud Computing and understand opportunities and challenges in the engineering and management of web-scale services.



EM 3: Digital Services

Information & Knowledge Management

The course primarily deals with one of the most significant recent technical advancements in Information and Knowledge Management, i.e. semantic web technologies and semantic web services. Practical applications such as the semantic media Wiki (based on Wikipedia technology) are jointly explored and give a hands-on experience to state-of-the-art Semantic web- and web 2.0-technologies and how they can be used in corporate environments. In addition, semantic web services as a new paradigm for modeling, orchestrating and executing services are presented. Practical applications based on Semantic Web Services are used to illustrate the potentials of the new technology.

IT Aspects of eCommerce

The objective of this course is to provide an overview and some insight into information and communication systems, tools, and services that are essential enablers of electronic commerce applications.

Complexity Management

The course gives an overview of all fundamental aspects of complexity. Key topics are: What is complexity and how can it be measured? How do people behave in complex situations and disasters? Accidents and disasters: reasons, structure and prevention; complexity: logic and structure; lessons from VLSI (Very Large Systems Integration) design and the theory of algorithms; chaos and topology dynamics and its structure; complexity of products and production: software engineering; complexity and electronic markets.

Information Pricing

This course is an introductory course into different aspects of complexity, e.g. psychological, computational, dynamic and management aspects of complexity. One of its goals for participants is to understand which structural parameters influence complexity and how this knowledge can be used to understand complex systems and to improve of complexity management.

Service Pricing

The objective of this course is to familiarize students with the specifics of service pricing and enable them to exploit potentials enabled by ICT. Particular focus is put on service pricing as a means to co-create value between provider and customer(s).

EM 4: Business Processes & Software Engineering

Business Process Engineering

This course introduces methods and tools to support the whole life cycle of business processes. This includes the phases business process modeling, business process simulation and analysis, as well as business process execution and monitoring. Different languages for business process modeling are presented, such as event driven process chains, Petri Nets and BPMN. Workflow management systems and service oriented architectures are introduced as two different concepts to support flexible executions of business processes.

Software & Systems Engineering

The course covers all stages of software systems development: systems planning, analysis and design, testing and implementation, as well as maintenance. Special focus is placed on embedding software systems in technical or sociotechnical environments. Different process models for software development are considered. Specific methods for software quality prediction and management, configuration management, software reuse, and cost estimation are presented. Software components and software architectures are treated in detail.

EM 5: Regulations & Economics of Networks

Communication Law

The lecture gives the international, European and national legal background for various business activities, such as data management systems, electronic market platforms and e-business models, and helps to develop relevant projects with view to later legal problems. It shall raise sensitivity to relevant legal problems. The module is related to the other legal modules, e.g. on property law.

Network Economics

The course gives an introduction into the economics of network industries. Specific characteristics of network industries are described including cost functions and the different levels of value creation. Based on this, the course will discuss the applicability of theoretical economic market models like monopolies, oligopolies and monopolistic competition. The differences between decentral decision-making and central organization are shown. The lecture will introduce typical pricing schemes for network industries such as peak load pricing, Ramsey pricing, multi-part tariffs or game-theoretical allocation of full cost. Finally, different regula-



tion schemes and their possible application in network industries will be explained.

Transport Network Economics

The course treats markets, network equilibriums, business models and regulation in the field of transportation including infrastructure and transport-service provision. The 4-step reference model for mapping transport systems is being presented. The user equilibrium and pricing strategies for optimizing the usage of transport networks are worked out. Finally, the regulatory framework of the transport sector is sketched. A significant proportion of the course is dedicated to case studies, in which the students should analyze a business concept before the background of the sectors' market structure.

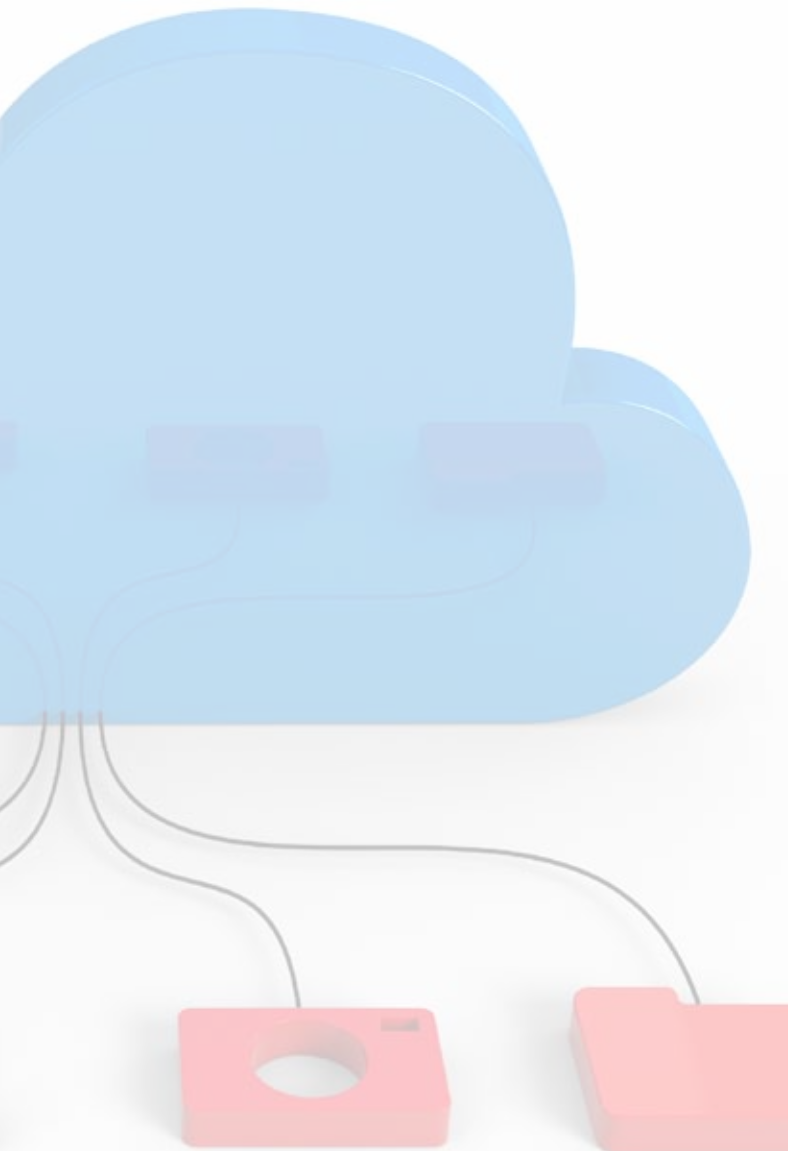
Telecommunication Network Economics

The course treats markets, business models and regulation in the field of telecommunication. First an overview on the telecommunication industry including markets, market actors, value creation chain and services is given. Then, bundling of services and different pricing models for network providers are introduced. Finally the necessity of regulation in the light of increased competition, network neutrality and incentives for investments in infrastructure and innovations is discussed.

Economics of Contracts

The course treats the basics of modern principle-agent theory and the principles governing the functioning of contracts within and across firms. The specific problems that arise in a framework of incomplete information are addressed. The course provides the tools and methods to deal with the incentive problems that arise from informational asymmetries by analyzing the optimal contract design. Other topics are the problem of truthful preference revelation, the Groves mechanisms, incomplete contracts and tournaments. Moreover, market forms such as internet auctions, and especially the phenomenon of "late bidding" are analyzed.

Your Notes:



Keyfacts of our Master Programs

HECTOR School Master Programs

Energy Engineering & Management (EEM)
Embedded Electronic Systems Engineering (ESE)
Financial Engineering (FE)
Green Engineering Mobility (GME)
Management of Product Development (MPD)
Production & Operations Management (POM)
Service Management & Engineering (SME)

Academic Degree

Upon successful completion of the Master Program participants will be awarded a Master of Science (M.Sc.) degree of the Karlsruhe Institute of Technology (KIT).

Language

The programs are taught in English. Foreign students are encouraged to take advantage of supplementary courses (for example German language classes).

Program Structure

The programs are run on a part-time basis with a program duration of 18 months. They are divided into 10 teaching units of 2 weeks, so called modules. The Masters Thesis (4-6 months) is designed as an industrial project supervised by the KIT.

Admission Requirements

- First university degree: e.g., Bachelor, Diploma (Uni/FH/BA)
 - 3 years of relevant work experience with according references
 - TOEFL score of at least 100 iBT-based or equivalent test
 - Optional: GMAT, GRE or HECTOR School Assessment
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Cost

Tuition fees for one entire Master Program are 30.000 €.

Service

The Master Programs are embedded into the environment of the International Department GmbH which also provides services like extra-curricula lectures, excursions as well as an attractive living and working environment.

Program Start

Intake 2013: March 04, 2013
Intake 2014: September 2014

Program starts are every 18 month in March/September. For individual solutions (e.g. schedules) please contact our program consultancy.

The Master Program is accredited by



PEOPLE | POTENTIAL | PERSPECTIVE



HECTOR SCHOOL OF ENGINEERING AND MANAGEMENT

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