Career Steps for Ambitious Engineers

Executive Master Programs

Technology + Management
# Table of Contents

Organization and Structure 4

Our Master Programs in...

- Management of Product Development 6
- Production & Operations Management 7
- Green Mobility Engineering 8
- Energy Engineering & Management 9
- Service Management & Engineering 10
- Electronic Systems Engineering & Management 11
- Financial Engineering 12

Topics of the Management Modules 13

Our distinguished Faculty 14

Cooperation with technological Leaders in Industry 16

Living & Studying in Karlsruhe 17

Alumni Voices 18

Become a Participant 19

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## Keyfacts of our Master Programs

### >> Program Structure
- Part-time
- Duration of approx. 18 - 20 months
- 10x 2 week modules
- 5 Engineering and 5 Management modules

### >> Teaching Language
English

### >> Academic Degree
Master of Science (M.Sc.) of the Karlsruhe Institute of Technology (KIT).

### >> Admission Requirements
- Bachelor, Master, Diplom
- 1-2 years of relevant work experience (recommended > 3 years)
- Corresponding job references
- TOEFL score of at least 230 or 95 iBT

### >> Costs
Tuition fees for one entire Master Program are 30.000 € including course materials.

### >> Next Program Start
Intake 2014: September 2014
Intake 2016: March 2016
Continued innovation is an important factor in maintaining the competitive advantage of companies and financial institutions in global markets. Hence, in addition of having cutting-edge business and technological knowledge, innovation management is required for research results translating them into innovative solutions for products. This increasingly becomes a deciding factor for the survival of a company.

The implementation of innovation management creates one of the greatest challenges for executives today. Maintaining a corporate climate of learning and steady adaptability is a key factor for success and is becoming more and more mandatory as an integral part of personnel development.

Providing supplementary comprehensive technical and business education for executives yields, therefore a competitive advantage, can be found while also allowing for corporate personnel development. Successful managers need a profound understanding of both technological intricacies and their implementation. Executives trained both as businessmen and as engineers are particularly destined to assume leadership positions in the global economy, due to their excellent education and resulting know-how.

More than ever, it is important to combine the advantages of cost efficient production sites with local production networks in order to perform better than competitors. Additionally, the ability to manufacture tailor-made products for customers must be continuously optimized. As a consequence, it is necessary to create instruments which allow project management in an international context. Cross-functional courses in Innovation Management, International Multiproject and Risk Management are unique in that sense that they provide state-of-the-art tools to plan, direct and control projects independent from their respective geographical location and the uncertainties of foreign business environments.

The Karlsruhe Institute of Technology (KIT) has an international reputation for excellence in teaching and cutting-edge research.

Seven advanced executive degree programs are offered at the HECTOR School, the Technology Business School of the KIT. These dual-track courses, which combine intensive training in management and engineering, ideally prepare high-potential professionals for strategic top management positions in industry.

At the end of the Master Program, participants obtain the internationally recognized »Master of Science« degree of the Karlsruhe Institute of Technology - a life changing education.

We welcome you to the challenge!

Prof. Dr.-Ing. Kai Furmans
Academic Director
Choose Your Program
The HECTOR School of Engineering and Management provides seven part-time Master Programs designed for young professionals in engineering positions. Our programs are more than typical MBA programs, because they combine management and engineering topics. The primary goal is to enable young professionals to take a holistic approach when managing highly interdependent processes.

More than just an MBA
The Engineering Modules of this program provide insight into the newest research topics in Energy Engineering & Management. They convey current and state-of-the-art methodology necessary to master the scope of innovative technologies.

Leadership Know How for Engineers
All programs share five Management Modules providing the participants with general knowledge in Finance, Accounting, Marketing, International Multiproject Management and International Law so they can consider commercial implications of business decisions.
Leadership for engineers in today’s fast changing and complex environment includes technological and organizational responsibilities and requires economical accountability and Human Resource Management. Workshops and case studies allow ample opportunity to explore the direct applications of the modules simulating the real business environment.

No Career Interruption
Intermittent periods of lectures are scheduled to allow participants to continue with demanding careers while acquiring new skills.

The program language is English and the duration is 18 months completing with the master thesis as a project work in the company. The master thesis allows the participants to work independently reflecting their own company’s needs and their specific business environment.
Successful participants receive the Master of Science awarded by the Karlsruhe Institute of Technology (KIT).

Structure of the Master Programs

<table>
<thead>
<tr>
<th>EM</th>
<th>MM</th>
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<tbody>
<tr>
<td>Engineering Modules</td>
<td>Management Modules</td>
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</tbody>
</table>

Green Mobility Engineering | Energy Engineering & Management | Electronic Systems Engineering & Management | Management of Product Development

+ 5 MANAGEMENT MODULES

Each program consists of 5 modules in the specific Engineering subject and 5 Management modules.
Structure of the Master Programs

This is the academic calendar for the intake in September 2014. The Master Programs consist of ten intensive modules of 14 days. The 5 Engineering Modules are displayed in green and the 5 Management Modules in blue colour. At the end, the Master Programs complete with a master thesis. It is possible to participate dissident from the program start in September if open places are available.

### Course Structure

<table>
<thead>
<tr>
<th>Month</th>
<th>Modules</th>
</tr>
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<tbody>
<tr>
<td>September</td>
<td>MM 1: 03 04 05 06 07&lt;br&gt;MM 2: 08 09 10 11 12&lt;br&gt;EM 1: 26 27 28 29 30&lt;br&gt;EM 2: 05 06 07 08 09</td>
</tr>
<tr>
<td>October</td>
<td>MM 1: 03 04 05 06 07&lt;br&gt;MM 2: 08 09 10 11 12&lt;br&gt;EM 1: 26 27 28 29 30&lt;br&gt;EM 2: 05 06 07 08 09</td>
</tr>
<tr>
<td>November</td>
<td>MM 1: 03 04 05 06 07&lt;br&gt;MM 2: 08 09 10 11 12&lt;br&gt;EM 1: 26 27 28 29 30&lt;br&gt;EM 2: 05 06 07 08 09</td>
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<tr>
<td>January</td>
<td>MM 1: 03 04 05 06 07&lt;br&gt;MM 2: 08 09 10 11 12&lt;br&gt;EM 1: 26 27 28 29 30&lt;br&gt;EM 2: 05 06 07 08 09</td>
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<tr>
<td>February</td>
<td>MM 1: 03 04 05 06 07&lt;br&gt;MM 2: 08 09 10 11 12&lt;br&gt;EM 1: 26 27 28 29 30&lt;br&gt;EM 2: 05 06 07 08 09</td>
</tr>
<tr>
<td>March</td>
<td>MM 1: 03 04 05 06 07&lt;br&gt;MM 2: 08 09 10 11 12&lt;br&gt;EM 1: 26 27 28 29 30&lt;br&gt;EM 2: 05 06 07 08 09</td>
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<tr>
<td>April</td>
<td>MM 1: 03 04 05 06 07&lt;br&gt;MM 2: 08 09 10 11 12&lt;br&gt;EM 1: 26 27 28 29 30&lt;br&gt;EM 2: 05 06 07 08 09</td>
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<tr>
<td>May</td>
<td>MM 1: 03 04 05 06 07&lt;br&gt;MM 2: 08 09 10 11 12&lt;br&gt;EM 1: 26 27 28 29 30&lt;br&gt;EM 2: 05 06 07 08 09</td>
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<td>June</td>
<td>MM 1: 03 04 05 06 07&lt;br&gt;MM 2: 08 09 10 11 12&lt;br&gt;EM 1: 26 27 28 29 30&lt;br&gt;EM 2: 05 06 07 08 09</td>
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<td>July</td>
<td>MM 1: 03 04 05 06 07&lt;br&gt;MM 2: 08 09 10 11 12&lt;br&gt;EM 1: 26 27 28 29 30&lt;br&gt;EM 2: 05 06 07 08 09</td>
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<td>August</td>
<td>MM 1: 03 04 05 06 07&lt;br&gt;MM 2: 08 09 10 11 12&lt;br&gt;EM 1: 26 27 28 29 30&lt;br&gt;EM 2: 05 06 07 08 09</td>
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<tr>
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</tr>
</tbody>
</table>

The Master Thesis is a project work in the company: October 2015 - April/June 2016

**Structure of the Master Programs**

- **Production & Operations Management**
- **Service Management & Engineering**
- **Financial Engineering**

+ **5 MANAGEMENT MODULES**
Management of Product Development

An integrated approach towards efficient product development sets virtual engineering processes in order to design highly utilized machine elements and systems.

Success through Innovation
Product development is the process of entirely planning and prototyping novel technical systems. It ranges from finding the product profile to creating a concept, designing, making prototypes, testing and validating. The actual manufacturing phase follows subsequently and is the second and final stage of the product creation process.

Thus, product development is certainly one of the core means of adding value in companies and is crucial for their success through innovation. Creativity and performance potential define the success of product development.

Challenges and Requirements
Working in the field of product development is a true challenge due to the enormous variety of requirements. However, it is also a great chance to achieve self-actualization and accomplish creative design.

Trends like mechatronics and customer individualization are making product development more and more complex. A new approach of going beyond the borders of various engineering domains such as computer science, electrical and mechanical engineering will therefore be necessary.

The three aspects of product development - systems, methods and processes - will be influenced and changed.

Tomorrow’s Product Development
A number of new challenges will appear in tomorrow’s product development. These challenges make it interesting and exciting to be involved in product development and to investigate it as a technical and economic discipline.

Participants of the Master Program Management of Product Development (MPD) are able to analyze, design, operate and implement the product development process in their companies in an optimized way by means of acquired research- and application-oriented methods and processes.

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Engineering Modules
EM 1 Design & Validation Process and Information Systems for Product Development
EM 2 Integrated Product Development
EM 3 Success Factors in Product Development
EM 4 Systems and Cases
EM 5 Multi-technological Systems and Workshops

Management Modules
MM1 Finance for Executives
MM2 International Project Management
MM3 Business Strategy, Marketing and Controlling
MM4 Human Resource Management
MM5 Law and Contracts
Production & Operations Management

Fundamental concepts are conveyed for the analysis, formation, design and realization of innovative services and also for screening the performance of a production industry.

Analysis, Design and Realization
Production & Operations Management (POM) is dealing with production and logistics and its links to the other value creating processes like product development and engineering in manufacturing companies.

Focus of the Program
The master program focuses on production processes, information technology, logistics, and international production engineering and management. Production and simulation are taught as tools and systems. International Production is a core subject. The program gives an overview on requirements, conditions and goals of production processes.

In the field of virtual engineering the highlight is set on the basics of process modelling, of benchmarking, the usage of IT as well as basic approaches to product lifecycle management.

Given that nowadays in production and logistics the flow of data, products and the monetary aspect are strongly interconnected, graduates are able to integrate these three factors in their decision processes.

Supply Chains
Production sites are linked with suppliers and markets. The optimization of production networks supply chains and logistics systems has to be constantly pursued. POM deals with the influence of stochastic markets as well as technical systems in a networked combination of resources. An emphasis is put on an understanding of the fundamental issues which govern production systems and supply chains.

Engineering Modules
- EM 1 Introduction Production and Operations Management
- EM 2 IT Support of Production Systems
- EM 3 Methods of Operations Management
- EM 4 Networks of Supply and Production Systems
- EM 5 Production and Distribution Systems

Management Modules
- MM1 Finance for Executives
- MM2 International Project Management
- MM3 Business Strategy, Marketing and Controlling
- MM4 Human Resource Management
- MM5 Law and Contracts
Green Mobility Engineering

Future mobility necessitates transport systems producing zero emissions. People will look after our environment, while moving hundreds of kilometers daily. This vision of 'green mobility' requires engineers who are committed to follow that principle and develop new 'green' technologies.

**Future Mobility**
About one-third of all energy consumed in a country is attributed to mobility. Transport emissions strongly influence global warming and air quality. Thus, people naturally wonder whether there is a chance for 'green mobility' systems embedded in the environment so as to impose minimal disturbance of the climate and the environment.

**Wanted: Visionaries**
Automotive companies worldwide are striving to develop vehicles that will allow us to save energy and protect our environment while staying mobile and independent. Therefore they have started to develop new technologies, new production methods and new ways to manage traffic information properly. To tackle those challenges requires globally thinking visionaries, engineers and managers that are able to combine competencies in mechanical and electrical engineering with excellent Know-how in economics, business management and law.

**Green Mobility Engineering**
This Master Program has been designed as an interdisciplinary program centred around energy management and mechatronics for automotive applications.

**Developing future “Green Mobility” products requires advanced technologies and production systems as well as an understanding of demand and supply in transportation markets.**

Participants will be well positioned to fill this urgent demand for specialists and leadership positions in this rapidly growing field of green technologies and applications.

**Engineering Modules**
- **EM 1** ICE, Power Train & Energy Storage
- **EM 2** Electrical Power Train
- **EM 3** Vehicle Driver Interaction
- **EM 4** Vehicle Traffic Interaction
- **EM 5** Success factors of Green Mobility

**Management Modules**
- **MM1** Finance for Executives
- **MM2** International Project Management
- **MM3** Business Strategy, Marketing and Controlling
- **MM4** Human Resource Management
- **MM5** Law and Contracts
Energy Engineering & Management

Managing the use of energy is key to industrial societies. The increasing use of energy has also brought with it a number of serious problems, some of which, such as global warming, present potentially grave risks to the world.

Challenge of Today
In the near future, more than seven billion people worldwide will need to be supplied with energy. Industry and universities are challenged to develop innovative concepts for a safe, economically efficient, sustainable and environmental friendly energy supply. Consumption of energy requires resources and has typically an effect on the environment. Many electric power plants burn coal, oil or natural gas in order to generate electricity for energy needs. Burning these fossil fuels produces a readily available and instantaneous supply of electricity, but it also generates air pollutants and increases global warming by emission of CO₂.

Renewable Energy Technologies
The large-scale use of renewable energy technologies could mitigate or eliminate a wide range of environmental and human health impacts of energy use and support a long term sustainable energy availability. Renewable energy technologies include biofuels, solar heating and cooling, hydro-electric power, solar power, water- and wind power.

Sustainable Energy
Since the sustainable availability of energy has become a significant factor in the performance of economy of societies, management of energy resources has become very crucial. Energy management involves utilizing the available energy resources more effectively that is with minimum incremental costs.

The executive Master Program Energy Engineering and Management targets to pave the way for an independent and sustainable energy system enabling a climate-neutral and sustainable energy supply.

The program is part of the Knowledge Innovation Centre InnoEnergy.

Engineering Modules
- EM 1 Renewables
- EM 2 Thermal Energy Conversion
- EM 3 Electricity Generation & Energy Conversion
- EM 4 Smart Networks and Energy Distribution
- EM 5 Energy Economics

Management Modules
- MM1 Finance for Executives
- MM2 International Project Management
- MM3 Business Strategy, Marketing and Controlling
- MM4 Corporate Innovation & Intrapreneurship (ESADE Business School in Barcelona)
- MM5 Law and Contracts
Service Management & Engineering

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.

**Status Quo of Services**
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.

**Future Service Economy**
Therefore, the SME master program has been designed as an interdisciplinary program centred around ICT-based services. It enables participants to understand how significantly modern ICT will shape the future service economy. At the same time, it will empower participants to exploit these technologies to develop competitive and innovative service offerings and to drive the service-oriented transformation of businesses and business networks.

**Demand for qualified Specialists**
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, participants are well positioned to fill this urgent demand for leadership positions in emerging and traditional industries applying ICT-based service concepts.

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**Engineering Modules**
- EM 1 Information and Service Management
- EM 2 Service Technologies
- EM 3 Digital Services
- EM 4 Business Processes and Software Engineering
- EM 5 Regulations and Economics of Networks

**Management Modules**
- MM1 Finance for Executives
- MM2 International Project Management
- MM3 Business Strategy, Marketing and Controlling
- MM4 Stochastic and Games
- MM5 Law and Contracts
New energy supply systems strongly depend on the developments in electronic engineering at the interface to information technology. Sustainable mobility concepts integrating electric vehicles and hybrid vehicles are increasingly using embedded electronic systems to maximize efficiency and reduce pollution. Other automotive safety systems are e.g. anti-lock braking systems, electronic stability control, and automatic four-wheel drive. Medical equipment is continuing to advance with more electronic systems for vital signs monitoring, electronic stethoscopes for amplifying sounds, and various medical imaging for non-invasive internal inspections.

Electronic systems are designed to do some specific task, rather than be a general-purpose computer for multiple tasks. Some also have real-time performance constraints that must be met, for reasons such as safety and usability; others may have low or no performance requirements, allowing the system hardware to be simplified to reduce costs. Since the electronic system is dedicated to specific tasks, design engineers can optimize it, reducing the size and cost of the product, or increasing the reliability and performance.

The demand for innovations by society and the raise of new technologies in universities and large scale research institutions offer tremendous opportunities to overcome “historic” electronic development thinking. The Master Program in Electronic Systems Engineering & Management offers courses in emerging technologies, systems engineering Know-how and methods.

Join us to acquire the tools that will guide your career in this exciting area.
Financial Engineering

Innovative solutions for pricing, hedging, trading and portfolio management problems by employing advanced mathematical methods and computer technology.

Design, Analysis & Pricing
In recent years, few disciplines have developed the way Financial Engineering has. The noteworthy progress in the theory of finance, together with the development of innovative financial tools, provided the means to find solutions for well-known problems in finance. The advancements can be found in the areas of design, analysis, and pricing of financial instruments which are essential to investment policies and the risk management process of both financial and non-financial companies.

Stochastics & Economic Models
The courses should enable graduates to develop and implement innovative solutions for problems in Financial Engineering based on both solid knowledge of finance theory and mathematical methods.

The participants will be able to analyze stochastic and econometric models of financial markets, and apply stochastic methods of operations research and game theory to financial problems. Further, they will be knowledgeable of electronic markets research and platform design, which are important in understanding the many developments in Financial Engineering.

Fig. 14: Black-Scholes Formula

\[ C = SN(d) - Xe^{-rT}N(d - \sigma \sqrt{T}) \]
\[ d = \frac{\ln\left(\frac{S}{X}\right) + (r + \sigma^2)T}{\sigma \sqrt{T}} \]

Prof. Dr. Marliese Uhrig-Homburg
Program Director
Financial Engineering

Engineering Modules
- EM 1 Information and Service Management
- EM 2 Quantitative Methods in Finance
- EM 3 Fixed Income and Derivative Securities
- EM 4 Financial Management
- EM 5 Risk Management

Management Modules
- MM1 Finance for Executives
- MM2 International Project Management
- MM3 Business Strategy, Marketing and Controlling
- MM4 Stochastic and Games
- MM5 Law and Contracts
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 Finance for Executives**
- **Topics:** Finance addresses two fundamental questions, which are central to corporate and private investment: how to raise capital and how to invest it. The course focuses on analyzing, interpreting and making reports of business activities in a company.

**MM 2 International Project Management**
- **Topics:** International Project Management is a key to the world of business. Participants will get familiar with objectives of project management and scheduling, analysing planned projects and controlling project execution. Particular attention is paid to the construction of project networks heuristic solution procedures and rescheduling. Modelling, planning and scheduling, which arise in a great variety of practical situations, are also emphasized.

**MM 3 Business Strategy, Marketing and Controlling**
- **Topics:** This module comprises three important challenges in companies, Business Strategy, Marketing and Controlling. Particular emphasis is placed upon the process of strategic management containing strategic analysis, strategy formulation, strategy evaluation based on competitive advantage, and portfolio strategy.

**MM 4 Human Resource Management**
- **Topics:** This module addresses challenges head on, exploring the key elements of innovation, creativity and leadership as well as the steps necessary to implement and manage it successfully. This multidisciplinary module provides valuable experience in implementing the techniques needed to ensure the company’s continuing success.

**MM 5 Law and Contracts**
- **Topics:** The economics section decision will be about theory, expected utility, risk and ambiguity, bargaining and incentive theory. In addition, problems regarding world economics are discussed, e.g. stagnation and economic growth, unemployment and international division of labor, and harmonization of the international monetary system. The legal section will be about the law of business organizations and international patent, trademark as well as copyright law.

**MM 4 Stochastic and Games**
- **Topics:** This module will enable participants to gain a better understanding of stochastic phenomena and, in particular, to use this knowledge for decisions in states of uncertainty. Uncertainty can arise from either »nature« or from playing against conscious opponents (»strategic uncertainty«).

**MM 4 Corporate Innovation & Entrepreneurship (ESADE, Spain)**
- **Topics:** This module, taking place at the ESADE Business School in Barcelona, provides participants with knowledge on strategies to manage innovation within the company. It focuses on issues like corporate innovation, corporate entrepreneurship, measuring innovation and innovation in practice. The participants shall acquire competencies as understanding the organizational context, managing change, decision making and innovation.

**MM 5 Law and Contracts**
- **Topics:** This module comprises both economics and legal sections. The economics section decision will be about theory, expected utility, risk and ambiguity, bargaining and incentive theory. In addition, problems regarding world economics are discussed, e.g. stagnation and economic growth, unemployment and international division of labor, and harmonization of the international monetary system. The legal section will be about the law of business organizations and international patent, trademark as well as copyright law.
Our distinguished Faculty

At the Karlsruhe Institute of Technology (KIT), research and teaching are vibrant and dynamic.

The KIT’s research activities are world renowned thanks to the proficiency of our faculty and graduate students. More than 50% of our professors bear the distinction of having spent 5-10 successful years in top-level positions in industry before returning to the field of higher education.

Our faculty therefore operates at the interface between research and industry. Exposure to the current business reality is provided by distinguished guest lecturers from industry and financial institutions. Recent guest lecturers include the former chancellor Gerhard Schröder, former Federal Minister for Foreign Affairs, Klaus Kinkel, the former CEO of the Deutsche Bahn AG, Hartmut Mehndorff, as well as many CEOs of US corporations such as Michael Dell and Bill Gates.

Profound knowledge and a 360° perspective provided by our faculty will prepare students to succeed in a technology-oriented business environment. As a result, many heads of human resource offices regard the degree programs offered by the Karlsruhe Institute of Technology (KIT) to be the best in the country.
**Prof. Dr. rer. nat. Frank Gauterin**  
Program Director Green Mobility Engineering  
Director of the Institute of Vehicle System Technology (FAST), KIT

**Areas of Expertise**  
- Vehicle NVH  
- Vehicle System Technology  
- Vehicle Control  
- Tire Technology

**Research Interests**  
- Vehicle System Technology  
- Vehicle Energy Efficiency  
- Vehicle Safety  
- Vehicle NVH

**Professional Career**  
- Director of the Institute of Vehicle System Technology (FAST), KIT  
- Since 2006 Full Professor; Head of the Center of the Automotive Research and Technology (KIT)  
- 1989-2006 different jobs at Continental AG, Hannover, at last Director NVH Engineering,  
- 1994 Ph.D. (Dr. rer. nat.), Universität Oldenburg  
- 1989 Diploma in Physics, Universität Münster

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

**Areas of Expertise**  
- Business Process and Software Engineering

**Research Interest**  
- Distributed Systems  
- Information Systems Modeling  
- E-Collaboration  
- E-Learning  
- Document Management

**Professional Career**  
- Board Member EUCIP  
- 2003 Appointed Full Professor Universität Karlsruhe (TH)  
- 1995 Appointed Full Professor Goethe Universität Frankfurt  
- 1995 Doctorate of Science (Habilitation) Universität Karlsruhe (TH)  
- 1990 Ph.D. (Dr. rer. nat.) Universität Mannheim

**Prof. Dr. Marliese Uhrig-Homburg**  
Program Director Financial Engineering  
Chair of Financial Engineering and Derivatives, KIT

**Areas of Expertise**  
- Finance  
- Financial Engineering

**Research Interest**  
- Derivative Securities  
- Credit Risk  
- Fixed income markets and term structure theory  
- Empirical finance  
- Corporate finance

**Professional Career**  
- 2011 Editor zfbfzfbbr  
- 2002 Appointed Full Professor Universität Karlsruhe (TH)  
- offers of Professorships to the Universities Greifswald, Ulm, Cologne, and the European Business School  
- 2001 Habilitation (venia legendi in Business Administration), Universität Mannheim  
- 1995 Ph.D. (Dr. rer. pol.) Finance, Universität Mannheim

**Prof. Dr.-Ing. Mathias Noe**  
Program Director Energy Engineering Management  
Head of Institute for Technical Physics, KIT

**Areas of Expertise**  
- Fusion technology  
- Power systems  
- Cryogenic high voltage engineering  
- High field superconducting magnets

**Research Interest**  
- Karlsruhe Tritium Neutrino Experiment  
- High Temperature Superconductivity  
- Fault current limiters

**Professional Career**  
- 06/1998 Ph.D, Technische Universität Hannover  
- Since 2006 Professorship in Technical Applications of High Temperature Superconductivity at the Faculty of Electrical Engineering and Information Technology, Universität Karlsruhe (TH)  
- Since 2006 Director of Institute for Technical Physics;  
- 2003-2006 Group Leader for Applications of Superconductivity in Power Systems at the ITEP  
- 2001-2005 Technical Coordinator of the Karlsruhe Tritium Neutrino Experiment at the ITEP  
- 1998-2001 Researcher at Institute for Technical Physics (ITEP), Research Center of Karlsruhe

**Prof. Dr. rer. nat. habil. Michael Siegel**  
Program Director Electronic Systems Engineering & Management  
Head of Institute of Micro- and Nanoscale Systems, KIT

**Areas of Expertise**  
- Micro- and Nanotechnology for low noise, high-speed sensors and mixed-signal circuits

**Research Interest**  
- Nanotechnology  
- Nanosensors  
- Nanoscale quantum devices  
- System-on-Chip Integration

**Professional Career**  
- 2002 Appointed Full Professor Universität Karlsruhe (TH)  
- 1999–2002 Project leader at Research Center Jülich GmbH  
- 1997–1998 Head of Task force group BMW-Rolls Royce GmbH, Research Center Jülich GmbH  
- 1995 CEO AMS SQUID GmbH, Saarbrücken  
- 1993–1995 Project leader at Research Center Jülich GmbH  
- 1989 Doctorate of Science Universität Jena  
- 1981 Ph.D. (Dr.-Ing.) Moskau University

**Prof. Dr. rer. nat. Frank Gauterin**  
Program Director of the Institute of Vehicle System Technology (FAST), KIT

**Areas of Expertise**  
- Finance  
- Financial Engineering

**Research Interest**  
- Derivative Securities  
- Credit Risk  
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- Empirical finance  
- Corporate finance

**Professional Career**  
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- 2001 Habilitation (venia legendi in Business Administration), Universität Mannheim  
- 1995 Ph.D. (Dr. rer. pol.) Finance, Universität Mannheim
Cooperation with technological Leaders in Industry

Increasing globalisation calls for innovative educational concepts: International firms need top national managers who are both highly technically qualified and also involved with the people, the language and the culture of their headquarters.

The management of globally operating companies requires to consider a wealth of local, national and international issues. This creates a tremendous need to find new and improved ways of operation.

The International Department (ID) as the legal roof of the HECTOR School was founded by Prof. Dr.-Ing. H. Weule, former CTO DaimlerChrysler AG. Due to his professional experience he realized the need to offer international programs at German Universities. The Hector School is strongly associated with the Karlsruhe Institute of Technology (KIT), yet organized as an independent entity supervised by an advisory council that comprises administrative leaders from the university alongside with top-level executives from associated companies.

»There’s no question about it: establishments such as the HECTOR School of Engineering & Management enrich the German higher-education landscape. They provide engineers and managers who already have a few years of professional experience under their belts with an excellent opportunity to extend their knowhow and broaden their knowledge. This is why Porsche sends its own staff for further training to Karlsruhe.«

Excerpt from the keynote speech at the Graduation Ceremony of the HECTOR School in July 2007 in the Schloss Karlsruhe.

»As a high-potential engineer in mid-career you often do not have time to participate in a second full time degree program. The dual approach of the HECTOR School efficiently interspersing periods of teaching with on-the-job-training coaches executives for the quantum leap into higher management. Moreover, the combination of management topics with state-of-the-art engineering know how is unique.«

Prof. Dr.-Ing. Jürgen Fleischer
Former Chairman MAG Europe
Living & Studying in Karlsruhe

Founded in 1715 Karlsruhe is situated in southwest Germany, close to the borders of France and Switzerland, and has a population of almost 300,000 residents.

In general, Germany is not known for being the world’s sunniest country. However, the region surrounding Karlsruhe is the exception to the rule. The winters are mild and summers offer the perfect weather to enjoy a day out swimming.

Karlsruhe’s extensive, convenient, and easy-to-use public transport system does not only cover the city itself, but also the surrounding area within a 70-kilometer radius. Main airports like Frankfurt International Airport can be reached within one hour by train.

Lush greenery throughout the campus beckons students to relax, linger, or study during breaks and between lectures. All important university facilities, offices, and counseling centers can be reached on foot, by bicycle or with public transportation. There is also a 24-hour campus library with 1,000,000 books and periodicals.

HECTOR School participants enjoy the privilege of living right in the middle of the city by taking advantage of the accommodation provided. Solidarity is fostered when participants spend time studying and living together.

With the Black Forest located in the south and the famous Rhine River to the west, the region surrounding Karlsruhe offers plenty of opportunity for relaxing in the natural beauty of south Germany. The theaters and museums in and around Karlsruhe cater to the cultural needs and one of the largest annual German open-air festivals, “Das Fest”’, is also held in Karlsruhe.

Karlsruhe also is one of the most dynamic high-tech areas in Europe – several major companies, such as Bosch, Siemens, Daimler, and Michelin, have their production facilities here. In addition, a large number of mid-sized businesses in the field of computer science, multimedia, control systems, energy technology, environmental science, and nanotechnology have been established in Karlsruhe.

The nickname “Fächerstadt” (Fan City) was given to Karlsruhe due to its unusual architectural design. From the air, it is visible that the Palace, which was the center of cultural activity during the Baroque period, has 32 roads extending outwards in a star-like formation. In fact, this form of architectural design was the inspiration for urban planning of other metropolises, such as Washington D.C..

In 1715, the Palace of the Prince-Elector, which was the center of cultural activity during the Baroque period, had 32 roads extending outwards in a star-like formation. This form of architectural design served as an inspiration for urban planning of other metropolises, such as Washington D.C., including: Karlsruhe’s extensive, convenient, and easy-to-use public transport system not only covers the city itself, but also the surrounding area within a 70-kilometer radius. Main airports like Frankfurt International Airport can be reached within one hour by train.

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**Chenjia Yu, Commerzbank AG Shanghai**  
**HECTOR School Graduate from 2009 (Intake 2007), FE**

> The Program is well-organized. I really learnt a lot. I believe, the Master Program will be helpful to one's professional life. Especially Financial Engineering is a hot topic these days in China.

**Joerg Weinhold, Daimler AG Germany**  
**HECTOR School Graduate from 2012 (Intake 2010), GME**

> The efficient usage of energy and limited resources is a key challenge for the growing human population and the future of our planet earth. To continue our prosperous lifestyle we need to lead the development of sustainable technologies and mobility solutions. With the ambitious studies of Green Mobility Engineering at HECTOR-SCHOOL I get a broad insight in the multitude of affected research fields. In a small, passionate team I learn to manage the widespread and very complex technical interrelations as well as financial, social and judicial necessities.

**Alexander Schwarz, BMW Group Munich**  
**HECTOR School Graduate from 2009 (Intake 2007), MPD**

> At the HECTOR School you will get the opportunity to work together both with highly motivated and business experienced students and outstanding professors and lecturers. The mixture of theory and its application in case studies and small group works is a very efficient way to boost your career.

**David J. Judge, MAG USA**  
**HECTOR School Graduate from 2009 (Intake 2007), POM**

> A priceless experience, filled with challenge and both personal and professional growth.

**Alexander Spies, Behr GmbH & Co. KG**  
**HECTOR School (Intake 2011), GME**

> “Studying Green Mobility Engineering at HECTOR School was the next step in a successful professional career for me. Highly experienced lecturers show the state-of-the-art research in the topics of electro engines, batteries, but also cognitive systems or embedded systems. On top, you are still able to continue your current job and to introduce the new methods to your daily business life.”

**Sonja Correia Santos, Robert Bosch GmbH**  
**HECTOR School Graduate from 2007 (Intake 2005), POM**

> “In my case, this program was part of my development career process agreed between me and my company. So, the expectations were very strongly focused on management training and deeper knowledge in logistics and production issues.”

**Fernando Martin, Bombardier Transportation**  
**HECTOR School Graduate from 2007 (Intake 2005), POM**

> The Master Programs offered by the HECTOR school will give you the opportunity not only to acquire new business knowledge, but also to gain visibility over the operations functions and dependencies in a global context. You will have the opportunity to discuss real problems, to benchmark your companies performance and processes and how problems are managed in different companies and countries. Last but not least you will make a good network of colleagues and friends, that you could use for professional purposes.”

**Armend Zenuni, Endress + Hauser Germany**  
**HECTOR School Graduate from 2009 (Intake 2007), ESEM**

> For me it was the short and effective way to get relationship overview between the development areas of embedded systems and disciplines surrounding them, e.g. financial activities, methods, constraints and opportunities, marketing regarding customer behavior and Price-Product-Promotion-Place aspects, and Management of different resources during development. Also the view in the future activities regarding new technologies and contacts to key persons (professors) on one of the elite Universities in Germany are the factors they will help me in the future work in my decision making process.

**Andrea Löhnert, Telecom Namibia Ltd.**  
**HECTOR School Graduate from 2009 (Intake 2007), SME**

> With the convergence of telecommunications and IP technology and the ever-increasing share of IT in most business activities, co-ordinating and managing the strategic dimension of as well as the operational interface with the technical side proved to be increasingly difficult. The program was exactly what I was looking for. I very much valued the Engineering modules, because they catapulted my knowledge to the forefront ‘of it all’ by covering a variety of relevant ICT/IT topics giving me a comprehensive overview and enough details to understand how everything works and fits together. I found the management modules most stimulating as they provided me with a much-needed refresher and update on the latest approaches in a field that will continue to be my core strength.”
APPLICATION AND ADMISSION

Become a Participant - Profit from a Strong Global Network

Admission Requirements

- First degree: Bachelor, Master, Diplom etc. (University, University of Applied Sciences, Cooperative State University)
- 1-2 years of relevant work experience, depending on Bachelor degree (recommended > 3 years)
- Corresponding job references
- TOEFL score of at least 230 or 95 iBT

The Objective

The M.Sc. Programs at the HECTOR School convey management skills and economic expertise for engineers, economists and computer scientists, who aspire to assume leadership positions.

The Target Group

We are looking forward to welcoming

- future engineering executives in production or logistics, plant engineering, development, production or product management, software engineering, IT Management, corporate finance or consolidated fields
- young professionals (age 25 - 40) identified as a high potential within the company
- participants who are thirsty for knowledge with a high motivation to work towards broader and higher responsibility

The Admission Process

Step 1: Application Submission
Please fill out our official application form and enclose:
- Copies of the highest academic degree
- Curriculum Vitae
- A letter of support from your company
- Corresponding job references
- TOEFL Certificate
- A financial declaration (personal/company)

Step 2: Application Check Admission Office
As soon as your application arrives, a confirmation is sent out. Your documents will then be checked at the Admission Office and if approved you will receive suggestions for interview appointments.

Step 3: HECTOR School Interviews
A 60-minute interview will be held personally or via telephone with the program director of the Master Program you applied for.

Step 4: Admission/Denial/Waiting List
- You receive a status report confirming your successful or denied application immediately after the admission committee meeting.